BAKKENLINK PIPELINE PROJECT

PLAN OF DEVELOPMENT

BakkenLink Pipeline Project
Dry Creek Terminal to Beaver Lodge
McKenzie and Williams Counties, North Dakota

BakkenLink Pipeline, LLC

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1. Introduction

1.1) General Introduction

The Project is a crude oil pipeline system consisting of approximately 37 miles of 16-inch steel crude oil pipeline extending from the Beaver Lodge receipt point in Williams County, North Dakota to the Dry Creek Terminal in McKenzie County, North Dakota (Figure 2-1). The connect to the Dry Creek Terminal will establish a connection with the existing BakkenLink Pipeline that is transporting crude oil to a rail facility operated by Great Northern Midstream LLC at Fryburg, North Dakota. BakkenLink is developing and intends to construct, own, and operate the Project.

This Plan of Development (POD) describes procedures that would be taken by BakkenLink Pipeline LLC (BakkenLink) and its contractors (Contractor) during the construction, operation, and maintenance of the BakkenLink Beaver Lodge to Dry Creek Terminal Pipeline Project (Project). This POD summarizes current proposed actions as presented by BakkenLink for this project and outlines mitigation or protection measures that would be implemented on the Project. The proposed action as described in the POD is the preferred route/alternative based on the analysis conducted by BakkenLink. Updates and modifications would be incorporated into this POD as necessary.

Proposed actions and measures in this POD apply to actions within the project area, defined as the construction right-of-way (ROW), access roads, and all additional temporary workspace (ATWS) utilized during the construction and staging of material for this project. BakkenLink and Contractor personnel would be aware of and familiar with this POD and its content prior to any project related construction.

1.2) Purpose of Plan

The purpose of this POD is to provide an overview of the proposed project, each construction phase, construction methods, potential pipeline impacts and mitigation measures, operation and maintenance, and reclamation procedures. The POD incorporates site specific drawings and schematics for contractors and construction crews to ensure safe and appropriate construction. The POD would be used in conjunction with other site specific plans.

Throughout this POD, maps and alignment sheets containing details regarding the Project ROWs are referenced and are included in the appendices. This includes crossings of roadways, utilities, waterbodies, and detailed information on required ATWS.

2. Purpose and Need

2.1) Description of Proposed Construction

The purpose of the project is to transport light sweet crude, typical of middle Bakken and upper Three Forks formations (“Bakken”) production. The preferred route of the proposed pipeline will consist of approximately 37 miles of 16-inch crude oil pipeline which would commence at the Dry Creek Terminal receipt point near Johnsons Corner, North Dakota, and terminate at the Beaver Lodge receipt point near Tioga, North Dakota. The initial capacity would be 100,000 barrels per day (BPD), beginning on the estimated in-service date of July 1, 2015. BakkenLink would transport crude oil from three proposed receipt points, including one existing and two new proposed crude oil truck receipt locations and

pipeline gathering receipt stations. Via connection to the Great Northern Midstream LLC rail facility, the crude oil collected by the Project would have improved access to key markets across the United States.

The Project would consist of the following pipeline assets and associated receipt points:

Table 2-1. Pipeline Assets

Diameter	Approx. Mileage	Description
16-inch	37.1	Bi-directional steel pipeline that would transport crude oil between Beaver Lodge Receipt Point on the north end of the system and the Dry Creek Terminal on the south end.

Table 2-2. Pipeline Associated Receipt Points

Receipt Point	County	Facility Status
Beaver Lodge	Williams, ND	Proposed
Keene	McKenzie, ND	Proposed
Dry Creek Terminal	McKenzie, ND	Existing

2.2)Project Need

BakkenLink would provide a number of producers in western North Dakota with a much needed alternative means of transporting their crude oil. BakkenLink shippers would be able to access new markets via a rail facility operated by Great Northern Midstream LLC near Fryburg, North Dakota and potential pipeline interconnects in the Beaver Lodge area. It is anticipated that the Project would encourage the development of pipeline gathering laterals and receipt points and outlet connections with third party pipelines.

The Project would address regional pipeline and outlet constraints as development of the Bakken Formation continues. Based on current rig activity, BakkenLink estimates that oil production and development associated with the Bakken and Three Forks formations has and will continue to increase beyond existing pipeline capacity in the geographic market area to be served by BakkenLink in the region. The expansion of the BakkenLink Pipeline from the Dry Creek Terminal to the Beaver Lodge receipt point is expected to reduce truck traffic in the project area. The reduction in truck traffic is expected to increase human health and safety over the long term by decreasing impacts to air quality and reducing traffic. In addition the reduction in traffic associated with the proposed project will reduce the strain on roads and related infrastructure.

The route design for the Project would provide various origination points (i.e., receipt points) in the most prolific and active parts of the middle Bakken and upper Three Forks development, as well as provide much needed access to pipeline service in the project area. The 16-inch-diameter pipeline allows for economic expansion opportunities.

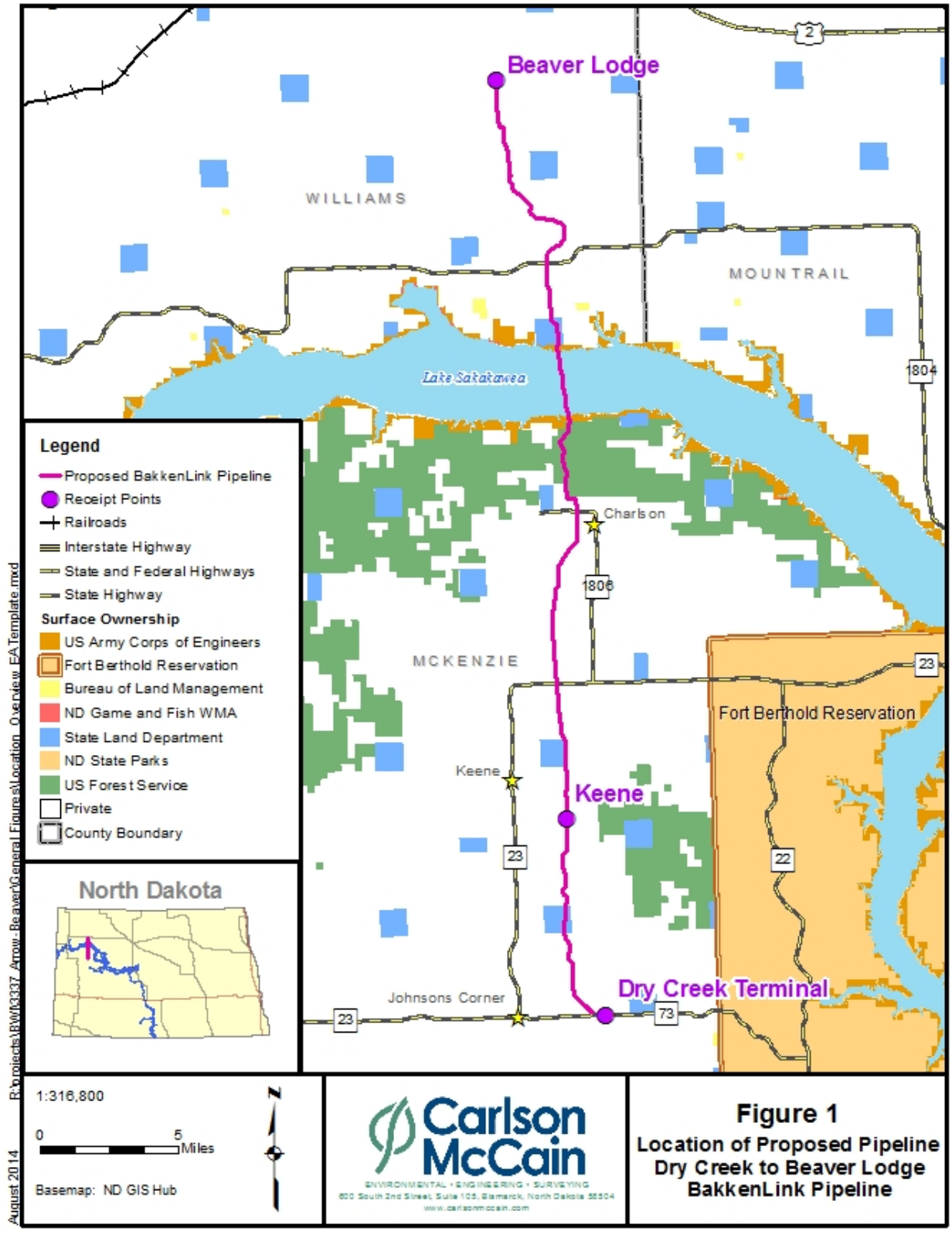

Figure 2-1. Project Overview Map

2.3)Commodity and Purpose

The Project would transport crude oil, specifically, light sweet crude, typical of middle Bakken and upper Three Forks formations ("Bakken") production. The Project would provide much-needed pipeline capacity to transport the increasing supplies of crude oil produced in portions of Williams and McKenzie Counties in North Dakota.

2.4) Pipeline Type

The Project would consist of a pipeline for the transportation of crude oil from three receipt points listed in Table 2-2 as well as connect the existing BakkenLink line to areas and outlets on the north side of Lake Sakakawea.

The proposed pipeline will be subsurface and buried according to the USDOT minimum depth requirement of four and a half feet to allow for approximately three feet of cover, except for locations/conditions which warrant deeper burial depths. The excavation trench width would be approximately 2 feet wide in stable soils, but up to 11 feet wide in saturated or otherwise unstable soils. Locations that warrant additional depth of cover include wetland and water body crossing, and where the depth of cover is governed by regulations, industry best practices, and construction methodology. Additional information is provided in Section 4.1 and Table 4-1.

2.5) Alternative Routes

BakkenLink evaluated several options for the proposed route with the participation of the U.S. Army Corps of Engineers (USACE) and the U.S. Forest Service (USFS), Bureau of Land Management (BLM) and various other state and federal agencies. Each option was considered in light of study of underserved Bakken development areas, economics, engineering design, feasibility to construct, and environmental impacts. The location of the proposed route was selected to have minimal effects on resources and residents. Key routing considerations included the location and number of receipt points in relation to the existing and proposed oil field production facilities as well as the crossing of the Missouri River at Lake Sakakawea.

The Missouri River crossing at Lake Sakakawea is a key logistical consideration. Several crossing locations were evaluated during preliminary design and planning of the Project. Crossing locations west of Williston, at New Town, and at a location approximately 10 miles west of the proposed location, have been evaluated. BakkenLink presented the different crossing location options for discussion at meetings with the USACE and USFS on November 2, December 9, 2010, and on February 9, 2011. As a result of the meetings with the federal agencies and evaluation of the engineering, construction and commercial drivers for the project, the current crossing location north of Keene was preferred over other crossing locations. There are currently pipelines installed in this area across the Missouri River thus creating a quasi-corridor for pipelines.

3. Right-of-Way Location

3.1) Description and Dimensions

The temporary construction ROW for the Project would generally be 100 feet wide. ATWS will be acquired at certain locations (e.g., staging for road, railroad, and river crossings) as found in **Appendix I**;

however, the temporary construction ROW may also be reduced in some locations as necessary to avoid/reduce impacts to environmentally sensitive areas such as wetlands. In these locations, the temporary ROW would be reduced to 75 feet or less to minimize impacts. Temporary ROW across USFS and USACE lands would be reduced to 50 feet.

The permanent easements generally would be 50 feet wide for the length of the pipeline (i.e., 37 miles). The location of the pipeline within the permanent ROW may vary depending on terrain, the presence of other existing facilities, landowner concerns, and environmentally sensitive resources. The Project would follow existing pipeline and utility easements where feasible. The permanent ROW would be reduced in environmentally sensitive areas to 30 feet or less. Across USFS lands, permanent ROW would be reduced to 20 feet.

For additional Project-related needs, a total of 51.6 acres of temporary area would be required for construction-related activities. These acres would serve as ATWS. The Beaver Lodge and Keene receipt point locations would be utilized as temporary pipe storage yards, as well as the existing facility located near the Dry Creek Terminal, and the scoria pit described in Table 3-1 below. Any additional pipe storage yards, equipment staging areas, or Contractor offices would be at designated pipe yards or existing Contractor facilities. Equipment wash stations would be located on the temporary workspace in areas to facilitate equipment cleaning to preclude the spreading of noxious weeds per the *Noxious Weed Plan* (**Appendix XXVII**). ATWS would be designated near wetlands, at HDD and bored crossings, and other areas where special construction techniques are necessary. BakkenLink would not utilize ATWS in any wetland and would use a minimum setback of 50 feet. In addition, hazardous materials, chemicals, fuels, etc., would not be stored within 100 feet of wetlands or waters of the U.S.; however, construction equipment may be staged within the ATWS. Other setbacks associated with wetlands/waterbody edges would include 50 feet all equipment staging areas and 10 feet for temporary storage of spoil material. Refueling of stationary equipment associated with the project would be done on USACE lands only with the equipment located within a secondary containment system. Refueling of non-stationary equipment associated with the project on USACE land would take place in one central location only which would be have a secondary containment system in place as well.

Table 3-1. Temporary Pipe Storage Yards

Yard	Approx. MP	Footprint * (Acres)	Location Description
Dry Creek Pipe Yard	0	15	Adjacent to route, near the Dry Creek Terminal
Keene Pipe Yard	7.5	30	At Keene Receipt Point
Moe Pipe Yard	30.17	13.58	Scoria Pit north of HWY 1804, just west of 101st RD
Beaver Lodge Pipe Yard	37	40	At Beaver Lodge Receipt Point

* No additional acreage will be disturbed for temporary pipe storage yards

In addition to these temporary areas, there would be three receipt points associated with the Project, one of which is an existing facility. The existing facility is the Dry Creek Terminal on the very southernmost terminus of this project. The two new receipt points would be constructed (and the lands purchased) by others. In relation to the project; however, they are related actions and therefore, will be included in the project design and operation analyses. The Keene and Beaver Lodge receipt points are estimated to have a footprint of 30 and 40 acres, respectively, resulting in a total of 70 acres committed to these sites.

At the three receipt point locations, all facilities, above-ground appurtenances, and pipeline inspection gauge (Pig) launcher assemblies would be within the fence lines of the receipt point, with the exception of mainline valves (MLVs), which would have impacts as noted in the typical MLV layout shown in **Appendix VII**. Additional permanent acreage impacts directly associated with the pipeline would be required MLVs located along the length of the pipeline. MLV sites would entail fenced in enclosures, 50-foot by 50-foot in size. Three MLVs would be located along the length of the pipeline. Acreages associated with MLVs can be seen below in Table 3.2, with locations along the pipeline shown in Table 5-1. All sites would require gravel, which is further described in section 5.3.

Table 3-2. Pipeline Appurtenance Acreage

Location	Description	Site Size (feet)	Footprint (Acres)
MLVs	3 Total MLVs	50 x 50 (each)	0.17 (Combined MLVs)

The Contractor would be responsible for logistics and securing lodging for the construction personnel. It is anticipated the existing man camps available commercially would be utilized for housing of personnel. These sites would have the requisite permitting and authorization from state, local and federal agencies. Additional information pertaining to construction personnel can be found in section 7.9.

3.2) Site-Specific Engineering Surveys for Critical Areas

Aerial LiDAR (Light Detection and Ranging) data was collected and processed at a width of 500 feet along the entire route to identify critical areas for site-specific surveys (i.e., wetlands). With this approach, the only additional survey work required was to locate the "entry and exit" points for the horizontal directional drills and to capture all of the above and below ground facilities crossed, such as roads, powerlines, pipelines, telephone lines, fiber optic cables, etc.

3.3) Waterbody Crossings

"Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes. Waterbody crossings would be constructed in accordance with applicable permits. Waterbody crossings will be constructed using various methodologies including: Designed Pipeline Self-Lowering, Open-cut trenching, and/or Horizontal Directional Drilling (HDD) technology. The methodology for each waterbody location would be determined by the crossing size and sensitivity. Waterbody crossings and methods are listed in **Appendix IX**. Specific methodologies for waterbody crossings have not been determined at this time, but would be determined by the Contractor based on construction site-specific circumstances as well as recommended mitigation based on input from the agencies. Additional HDD crossing information is included in Table 10-2.

The Route traverses the Lake Sakakawea (HUC 10110101) watershed. The route crosses one perennial stream (one total crossing): the Missouri River (Lake Sakakawea). Stream crossing locations and crossing methods are summarized in **Appendix IX**. A list of total stream crossings by county can be seen below in Table 3-3. The crossing of the Missouri River (i.e., Lake Sakakawea) is included as a perennial stream crossing.

Table 3-3. Stream Crossing Totals by County

County	Intermittent	Perennial	Total
McKenzie	17	1	18
Williams	10	1	11
Total	27	2	29

Except for Lake Sakakawea, all water bodies that would be crossed by the BakkenLink Pipeline Project would have a minimum of five (5) feet of cover from the top of the pipe to the bed of the waterbody. For Lake Sakakawea, the minimum depth of cover would three (3) feet as shown below in Table 3-4.

Table 3-4. Exceptions to General Depth of Cover

Waterbody	Crossing Method	Depth of Cover
Lake Sakakawea	Trench/Pull	3 feet minimum cover below the lake bed

Pertaining to the crossings of Lake Sakakawea, specific crossing details, plans, and maps can be found in **Appendix X**. Crossing depths for this water body crossing is partially determined by the construction method. Three feet minimum cover for the lake crossing meets the federal requirement for pipeline cover and is standard for marine pipelay techniques. In addition to the minimum cover, extra measures were taken in the design to protect the pipeline crossing the lake.

Additional protective measures for Lake Sakakawea pipeline crossing include:

- Increased 0.375" wall thickness will be used for pipe crossing lake as compared to standard line pipe of 0.312" wall thickness
- Reinforced concrete weight coating for enhanced mechanical protection and buoyancy control
- Increased depth of cover at the shorelines with additional rock cap
- Remote controlled isolation double block valves as close as practical to the shoreline
- Remote line pressure monitors/transmitters at the valve locations

An alternative HDD crossing method for Lake Sakakawea was also considered, and is included in **Appendix X**. BakkenLink evaluated both the proposed and alternative lake crossing methodologies. The determination that the alternative HDD method was not a viable method and will be discussed more in **Appendix X**.

3.4) Land Status Right-of-Way Acreage

The proposed pipeline route would traverse private, state, and federal lands. Approximately 28.9 miles (78 percent) of the proposed route would be on private lands, 3.12 miles (8.4 percent) on state lands,

and 5.04 miles (13.5 percent) on federal lands. A breakdown of the pipeline length and acreage for the permanent easements (i.e., 50 ft wide typical, except 20 ft wide for USFS) and temporary construction ROW (i.e., 100 ft wide, except 50 ft wide for USFS) can be seen below in Table 3-5**.**

Table 3-5. Pipeline Right-of-Way by Land Status

Land Status	Percentage (%)	Pipe Length (Miles)	Pipe Length (Feet)	Permanent Easement (Acres)	Temporary Construction ROW (Acres)
Federal (USFS)	6.5	2.43	12,830	5.9	14.7
Federal (USACE)	7.0	2.61	13,781	15.8	31.6
State	8.4	3.12	16,474	18.9	37.8
Private	78.0	28.94	152,803	175.4	350.8
Total	-	37.1	195,888	216.0	434.9

3.5) Identification and Map Notation of Temporary Construction Workspace

In addition to the pipeline acreage used for both the permanent easements and temporary construction ROW specific to the pipeline, ATWS would be required along the route and would amount to a total of 51.6 acres as previously mentioned. Specific Project ATWS locations and acreage can be found in **Appendix I**. A total of four temporary pipe storage yards would be required during the project [one 15-acre, one 30-acre, one 13.58-acre, and one 40-acre yard (Table 3-1)]. The 15-acre pipe yard will be located at the existing Dry Creek Receipt Point. The 30 and 40-acre pipe yards will both be located at the two new receipt points, Keene and Beaver Lodge, respectively. The 13.58 pipe yard will be located at the existing scoria pit near HWY 1804. Three MLV sites along the proposed pipeline would account for an additional 0.17 acres (Table 3.2).

In sum, a total of 801.08 acres of land would be required for construction-related activities for the project [i.e., 650.9 acres for combined temporary construction ROW and permanent easements, 51.6 acres for ATWS, 98.58 for temporary pipe storage yards and purchased project-related land (for receipt points)]. Typical Project ROW and ATWS construction drawings can be found in **Appendix II.**

4. Facility Design Factors

4.1) Pipeline Specifications (Pressure, Temperatures, and Depths)

The BakkenLink Pipeline is designed to be a 16-inch-diameter steel pipeline for the transportation of crude oil. The system would only accept for transport light sweet crude, generally low in sulfur content and typical of production from the Bakken pools in North Dakota. The specifications of the pipeline segments are described below:

- 16-inch Trunkline -- 16.00” OD X 0.312” WT, API 5L-X65
- 16-inch Drilled/Bored Crossings -- 16.00” OD X 0.375” WT, API 5L-X65

The pipeline is designed for a maximum temperature rating of 120 degrees Fahrenheit and a maximum operating pressure of 1,480 pounds-force per square inch gauge (psig). The Project would typically operate at 60 degrees Fahrenheit and between 200 to 1,480 psig. The 16-inch-diameter trunkline is

designed for an initial flow rate of 100,000 BPD. The maximum design flow rate of the 16-inch-diameter trunkline is 135,000 BPD with the projected associated facilities.

USDOT regulations specify a minimum cover of 3 feet from natural ground to top of pipe. For 16-inch-diameter pipe, the trench is typically about four and a half feet deep to allow for approximately three feet of cover. The trench would be approximately two feet wide in stable soils and up to 11 feet wide in saturated or otherwise unstable soils. Additional trench width may be required to maintain stability of trench walls for the safety of pipeline workers and equipment. The pipeline would be installed to a minimum depth of 5 feet below the bottom of waterbodies including rivers, creeks, streams, ditches, and drains, to maintain four feet of cover. This depth would normally be maintained over a distance of 15 feet on each side of the waterbody measured from the top of the defined stream channel. The following table indicates standard depths that would apply to pipeline construction.

Table 4-1. Pipeline Depth

Location	Excavation (inches)
Undeveloped Section Line crossing	72
Rangeland and cultivated lands	48
Industrial, commercial, and residential areas	48
Crossings of inland bodies of water with a width of at least 100 ft from high water mark to high water mark	60
Drainage ditches at public roads and railroads	48

Depth of cover requirements may be modified by BakkenLink based on site-specific conditions. Lake Sakakawea is an example of modifications to the general depth of cover requirements due to site-specific conditions. Information about these crossings is provided in Section 3.3. All depths, however, would be in compliance with all established codes.

5. Additional Components of Right-of-Way

5.1) Location of Facilities and Connections to Existing Facilities

Three receipt points, described in Table 2-2, would be used for input of product. Receipt points would consist of an interconnection installed in the pipeline to allow connection to a truck terminal or other third-party facilities.

Due to the sufficient pressure to be provided from existing input sources, no separate pumping stations would be built as part of the Project. The pressure provided by input at the receipt locations through delivery pumps would be adequate for operation of the pipeline at the current projected flow rates. Truck unloading facilities, Lease Automatic Custody Transfer (LACT) units, and delivery pumps would be provided by others at the receipt points. Surface facilities included in the Project would be limited to pipeline markers, cathodic protection test stations, communications equipment, and MLVs. Fenced-in enclosures may be installed to house power, control systems, and communications equipment, allowing valves to be operated remotely. All pig launchers/receivers will be located within receipt point sites. Site footprints and layouts for pig launchers/ receivers and MLVs can be observed in **Appendices IV, V, VI, and VII**.

Table 5-1 summarizes the approximate milepost (Approx. MP) designations between receipt points and lateral interconnections of the trunkline and MLV locations.

Table 5-1. Pipeline Mileposts

Location	Approx. MP
Dry Creek Terminal (includes pig launcher)	Trunkline - 0
Keene Receipt Point	Trunkline - 7.5
MLV 1	Trunkline – 20.3
MLV 2	Trunkline – 22.8
MLV 3	Trunkline – 25.6
Beaver Lodge Receipt Point (includes pig receiver)	Trunkline – 37.4

5.2) Possible Future Components

New pumping stations or additional equipment may be added at planned receipt point locations in the future to boost the Project's capacity from 100,000 BPD to approximately 135,000 BPD. Aboveground storage tanks (AST) also may be installed in the future at strategic locations to allow for storage and other operational considerations. The location for new pumping station and future ASTs would be determined based on future demand and needs.

5.3) Need for Gravel and Sand

Gravel and/or sand are expected to be required for construction. The gravel type is assumed to be dry gravel ranging from ¼ to 2 inches. Approximately 3,016 tons would be used for improving access roads. Locations where gravel or matting will be needed are provided in **Appendix XI** and specific gravel estimates are noted as well. Approximately 419 tons of gravel would be used for HDD staging areas for the HDDs described in Table 10-2. While the pig launchers and receivers and the majority of valves would be located within the receipt point facility footprints, the three MLV sites however would require gravel within their respective footprints. The three MLV sites would require 210 tons of gravel combined. The total expected need for gravel for road improvements, HDD staging sites and, MLV sites is approximately 3,644 tons. No blasting is expected as part of the construction process, so no gravel would be needed to replace rock areas. Should additional gravel or sand be required during the course of construction, the Contractor would be responsible for providing the materials and finding a local site or vendor approved by BakkenLink for procurement. Any potential additional sand or gravel source would be inventoried for noxious weeds by an environmental inspector prior to approval for use on the ROW.

6. Government Agencies

6.1) Permit Stipulation and Federal, State, and Local Agencies Involved

Federal agencies involved in the Project and which BakkenLink has been working directly with include the U.S. Fish and Wildlife Service, Natural Resources Conservation Service, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, U.S. Forest Service (McKenzie Ranger Districts), U.S. Department of Transportation Federal Highway Administration, U.S. Department of Transportation Pipeline and

Hazardous Materials Safety Administration, U.S. Bureau of Land Management, and National Park Service.

State agencies with which BakkenLink has been working include the North Dakota Department of Transportation, North Dakota Game and Fish Department, Parks and Recreation Department, Department of Health (Air and Water Quality Divisions), State Historical Society, State Public Service Commission (PSC), and State Water Commission. BakkenLink also has been working with McKenzie and Williams Counties, and Pleasant Valley and Dry Fork Townships.

A list of required state and federal permits and stipulations can be found in Table 6-1. BakkenLink would also work with all other local entities (i.e., gas, oil, public utilities, etc.) and adhere to all crossing standards required as necessary. In addition, BakkenLink would treat all private landowners fairly and honor commitments and agreed upon requirements as applicable.

Table 6-1. State and Federal Permitting

Agency	Type of Approval	Need
Federal Permits		
Army Corps of Engineers	Outgrant Application Permit to Construct	Required for Lake Sakakawea Crossing
	Section 10/404 Permit to Construct	Required for Lake Sakakawea Crossing
	Nationwide Permit 12	Will obtain if required
Bureau of Land Management	Lead Federal Agency	Coordinate federal review
	Decision Document for Environmental Assessment	Required to allow construction of the project to begin
	Federal ROW Grant	Required to allow construction of the project to begin
Department of Transportation, Federal Highway Administration	Permit	Required to cross federal-aid highways
U.S. Forest Service	Permit to Construct	Required on U.S. Forest Service Land
U.S. Fish and Wildlife	Section 7 Consultation	Biological Opinion
State of North Dakota and County Permits		
ND State Land Department	Permit	Before Individual landowner consultations
ND Department of Transportation	Utility Occupancy Permit	ROW occupancy permit for state roadway crossings
ND State Water Commission	Sovereign Land Permit	ROW access across Missouri River
	Water Use Permit	Prior to use of water from State regulated source
ND State Historical Society	Cultural Resource Review	Compliance with NDCC 55-03 to assess the potential project impacts to cultural resources
ND Game and Fish	Consultation	Suggested timing restrictions for

Agency	Type of Approval	Need
Department		construction in waterways. Cooperating agency on Federal EA
ND Department of Health, Air Quality Division	Permit to Construct	Required for construction of receipt points
ND Department of Health, Water Quality Division	401 Water Quality Certification	ND Department of Health is cooperating agency with the USACE and would determine impacts to water quality
	North Dakota Pollutant Discharge Elimination System SWPPP	Required for construction projects disturbing 1 or more acres, must have either individual storm water permit or coverage under one of North Dakota's general permits
	Discharge of Hydrostatic Test Water	Permit to discharge hydrostatic test water
ND Public Service Commission	Certificate of Corridor Compatibility and Route Permit	Required to construct a transmission facility
	Certificate of Public Convenience and Necessity	Required for a public utility to construct or operate a public utility
	Permit	Required for road crossings
McKenzie County, ND	Permit	Required for road crossings
Williams County, ND	Permit	Required for road crossings
Other Entities	Permit	For all other utility crossing

6.2) Existing Plans of the State, Local Government, and Private Entities

BakkenLink has identified several energy infrastructure projects near the Project but has not identified any potential conflicts. BakkenLink has consulted with various federal, state, and local governments, as well as local businesses and residents, and has not identified any conflicts with proposed developments in the vicinity of the Project.

7. Construction of the Facilities

7.1) General Construction Description

BakkenLink's facilities would be designed, constructed, tested, operated, and maintained in accordance with applicable requirements of the USDOT regulations in 49 CFR §195, United States Department of Labor regulations, Occupational Safety and Health Administration (OSHA) requirements, and other applicable federal and state regulations. These regulations are intended to ensure adequate protection for the public and to prevent crude oil pipeline accidents and failures. Among other design standards, 49 CFR §195 specifies pipeline material selection; minimum design requirements; protection from internal, external and atmospheric corrosion; and qualification procedures for welding and operations personnel.

Pipeline construction is much like a moving assembly line. Construction of the pipeline involves several procedures that are summarized in the following Sections. These operations include:

- Survey and staking;
- Clearing and grading;
- Trenching;
- Pipe stringing;
- Bending;
- Welding;
- Lowering the pipeline;
- Backfilling;
- Hydrostatic testing; and
- ROW cleanup and restoration.

Construction would proceed along the pipeline in one continuous operation. As construction proceeds along a segment, as described in Table 7-1 and depicted in **Appendix XII**, construction at any single point along the pipeline, from initial surveying and clearing, to backfilling and finish grading, is anticipated to last about six to ten weeks. Multiple segments may be constructed at the same time. The entire process would be coordinated in such a manner as to minimize the total time an individual tract of land is disturbed, exposed to erosion, or temporarily precluded from its normal use. Typical construction ROW drawings can be found in **Appendix II** and typical construction drawings for the Project can be found in **Appendix III**.

Table 7-1. Construction Segments

Segment No.	Start Location	End Location	Approximate Length* (Miles)	Approx. MP	
1	Dry Creek Terminal	South of Lake Sakakawea	22.8	0	23
2	South of Lake Sakakawea	North of Lake Sakakawea	2.8	23	26
3	North of Lake Sakakawea	Beaver Lodge Receipt Point	11.5	26	37

*Segment lengths are approximate and the exact location for each segment beginning and end points will be provided in Issue for Construction (IFC) drawings.

7.2)Survey and Staking

The first step of construction would involve marking the limits of the approved work area (the construction ROW and ATWS), the pipeline centerline, access roads, existing utility lines, and other special areas. Sensitive areas such as wetland boundaries and cultural resource sites would be marked and flagged for implementing protective measures. Markers will be labeled “Environmental Sensitive Area” and won’t specifically identify the resource. BakkenLink would notify landowners in advance of construction activities that could affect their property, business, or operations.

7.3)Clearing and Grading

The construction ROW would be cleared and graded (where necessary) to provide a relatively level surface for construction equipment, a sufficiently wide workspace for the passage of heavy construction

equipment, and safety for the pipeline workers. Vegetation would be mowed and cleared to the edge of the work area in grassland areas where grading is not required.

To avoid soil mixing, topsoil would be removed and segregated from the underlying subsoil. Topsoil would be removed from the entire width of the ROW (i.e., over the trench, spoil side, and on the working side of the temporary construction ROW) for the entire length of the pipeline. Topsoil would be segregated and stored on the temporary construction ROW on the opposite side of the trench from the "working side" where construction activity would take place. After pipeline installation is complete, the subsoil would then be replaced in the pipeline trench and adjacent areas to restore the land's natural contours. Only then would the topsoil be replaced in the locations from where it was initially removed. Special, site-warranted cases, however, may require the storage of topsoil on the "working side" of the trench (e.g., construction on an upward facing side slope), however, topsoil would still be removed from the entire width of the ROW. In these instances the topsoil would be stored outside of the actual work area and would be located on the adjacent ATWS. Typical construction schematics depicting topsoil and subsoil storage locations in relation to the Project ROW for these special site-warranted cases, in addition to most other field cases which will be encountered during construction, can be found in **Appendix II**.

The depth of topsoil stripping would vary according to the ROW landscape position. Construction activities would be suspended during abnormally wet conditions to prevent excessive rutting or mixing of topsoil with subsurface soils.

Fences and gates would be constructed during the clearing and grading operations to allow continuous use of pastures, grazing units, and livestock facilities. Silt fence would be installed along the ROW adjacent to wetlands and streams. When crossing small water features such as small ponds, streams, and creeks, approved temporary flumed structures will be constructed to minimize impacts to the water feature. Specific methodologies for waterbody crossings have not been determined at this time, but would be determined by the Contractor based on construction site-specific circumstances as well as recommended mitigation based on input from the agencies. Temporary erosion controls will be installed after initial disturbance of soils, where necessary, to minimize erosion. Erosion controls would be maintained throughout construction. Typical schematics for the temporary structures mentioned above can be found in **Appendix III**.

7.4) Pipe Stringing, Bending, and Welding

After clearing and grading, the Contractor would string the pipe along the ROW. Pipe would either be stored at storage yards or transported directly to the pipeline ROW. The pipe lengths are typically 40 to 80 feet long. A stringing crew using special trailers would move the pipe along the ROW.

A pipe-bending machine would be used to make slight bends in the pipe to account for changes in the pipeline route and to conform to the topography. The bending machine uses a series of clamps and hydraulic pressure to make a smooth, controlled bend in the pipe. All bending is performed in strict accordance with federally prescribed standards to ensure integrity of the bend.

Pipe would be bent at the mill when necessary for sharp bends. The pipe would be pre-coated at the mill with a fusion-bonded epoxy external coating (or other coating technique) to provide corrosion protection.

A welding process would be utilized to join the sections of pipe into one continuous length. Each welder would be required to pass an approved qualification test to work on a particular pipeline aspect. The qualification tests would be conducted using project specific weld procedure(s) that would be developed in accordance with federally adopted welding standards.

Welds would be nondestructively tested to ensure structural integrity and compliance with the applicable USDOT regulations. Those welds not meeting established specifications would be repaired or removed. Once the welds are approved, the welded joints would be externally coated and the entire pipeline would be visually and electronically inspected for coating defects, scratches or other damage. Any damage or defects would be repaired before lowering into the trench.

7.5)Trenching

Trenches would be excavated using a wheel trencher or backhoe. Special excavation equipment or techniques may be used if large quantities of solid rock are encountered.

Trenches would be excavated to a depth sufficient to provide the minimum cover required by federal, state and local municipalities as well as landowner requirements. USDOT specifies a minimum cover of 3 feet from natural ground to top of pipe. Specific trench dimensions and depths of cover are discussed in Section 3.3 and 4.1.

The amount of open trench permitted at any time during the project will be governed by the stability of the trench and the prevailing weather conditions. The open trench will be restricted so as not extend more than three miles ahead of the “firing line” unless approved by Company. When the trench is excavated through lands where livestock is confined or through cultivated fields where it is desirable for the landowner to have a passageway across the trench, temporary fences, gates and/or bridges will be installed to provide appropriate restriction or safe access across the open trench.

7.6)Lowering-in, Padding, and Backfilling

A series of side-boom tractors would simultaneously lift welded sections of the pipe and carefully lower the sections into the trench. Non-metallic slings protect the pipe and coating as it is raised and moved into position. In rocky areas, the Contractor may place sandbags or foam blocks at the bottom of the trench prior to lowering-in to protect the pipe and coating from damage. Trench breakers or water stops will be installed, as necessary, adjacent to wetlands and stream crossings to eliminate groundwater migration along the trench. Construction schematic drawings can be found in **Appendix III**.

The trench would be dewatered, as necessary, prior to lowering in. Dewatering effluent would pass through sediment filters (hay bale structures and/or filter bags), to ensure compliance with applicable water quality requirements. Construction schematic drawings can be found in **Appendix III**.

The trench would be backfilled after the pipe has been installed. Soil would be returned to the trench in the reverse order of excavation. Where topsoil was segregated, subsoil would be backfilled first followed by the topsoil. The trench line (subsoil) would be compacted with a wheeled-roller or other suitable construction equipment. A crown would be left over the trench line to allow for natural subsidence. If the excavated material (rock) can damage the pipe and/or coating, the pipeline would be protected with a rock shield and/or covered with select fill, obtained from commercial borrow areas or by separating suitable material from nearby trench spoil. Topsoil would not be used for padding.

7.7) Hydrostatic Testing

The entire length of the pipeline would be hydrostatically tested before being placed into service. Requirements for this test are prescribed in the USDOT's federal regulations. Depending on the varying elevation of the terrain and the location of available water sources, the pipeline may be divided into sections to facilitate the test. The pipeline section breakdowns are provided in Table 10-1 and 10-2. Water use from municipal and/or private water sources is anticipated.

Each pipe section would be filled with water and pressured to a level higher than the operating pressure. The test pressure would be held for a specific period to confirm that it meets the design strength requirements and if any leaks are present. BakkenLink would require a minimum hydrostatic test pressure of 1850 psig. The maximum pressure would be limited to 95% of the SMYS (Specified Minimum Yield Strength) of the steel pipe, which is 2408 psig.

Hydrostatic test water would be discharged in accordance with applicable permits. It is anticipated that hydrostatic test water would be discharged overland within or along the edges of the construction ROW using energy dissipation devices to minimize erosion and sedimentation. Test water will not be discharged onto USACE land. Test water would contact only new pipe and BakkenLink does not plan to add chemicals to the test water. Once a test section successfully passes the hydrostatic test, the water is emptied from the pipeline in accordance with federal and state requirements. The pipeline would then be dried to assure it has no free water in it before oil is put into the pipeline. A *Hydrostatic Test Plan* can be found in **Appendix XIV**.

7.8) Cleanup

The final step in the construction process is restoring the ROW as closely as possible to its original condition. Depending on the Project requirements, this typically involves decompacting construction work areas, replacing the topsoil, and seeding non-cultivated land. Decompaction would occur in areas where the topsoil was not stripped but would have experienced sufficient construction traffic to cause soil compaction. As discussed in section 7.3, since topsoil would be stripped across the width of the entire construction ROW, it is anticipated that decompaction measures would only be necessary for specific, site-warranted circumstances. Decompaction measures are further described in **Appendix XIII**. Final grading is anticipated to occur within 20 days of backfilling the trench. Permanent erosion control measures including, but not limited to trench plugs, permanent slope breakers, erosion control matting, and riprap would be installed as necessary and shown in construction drawings within the ROW during this phase. Additional information pertaining to permanent erosion and sediment control can be found in the *Construction Mitigation and Reclamation Plan* (CMRP) in **Appendix XIII.**

Rocks greater than 6" across would not be placed within one foot of the surface on tilled land. Rocks would be collected and disposed of off the ROW or at a location designated by the landowner.

Pipeline markers and/or warning signs would be placed along the pipeline centerline at specified intervals to identify the location of the pipe. Access roads would be restored to pre-construction conditions, unless otherwise specified by the property owner and approved by regulatory agencies. Private and public property (fences, gates, driveways, roads, etc.) that were disturbed by construction would be restored to their original or better conditions, consistent with agreements with individual landowners, counties and/or townships, and any applicable permit requirements.

The schematic diagram below in Figure 7-1 shows the above described typical construction sequence for pipeline installation.

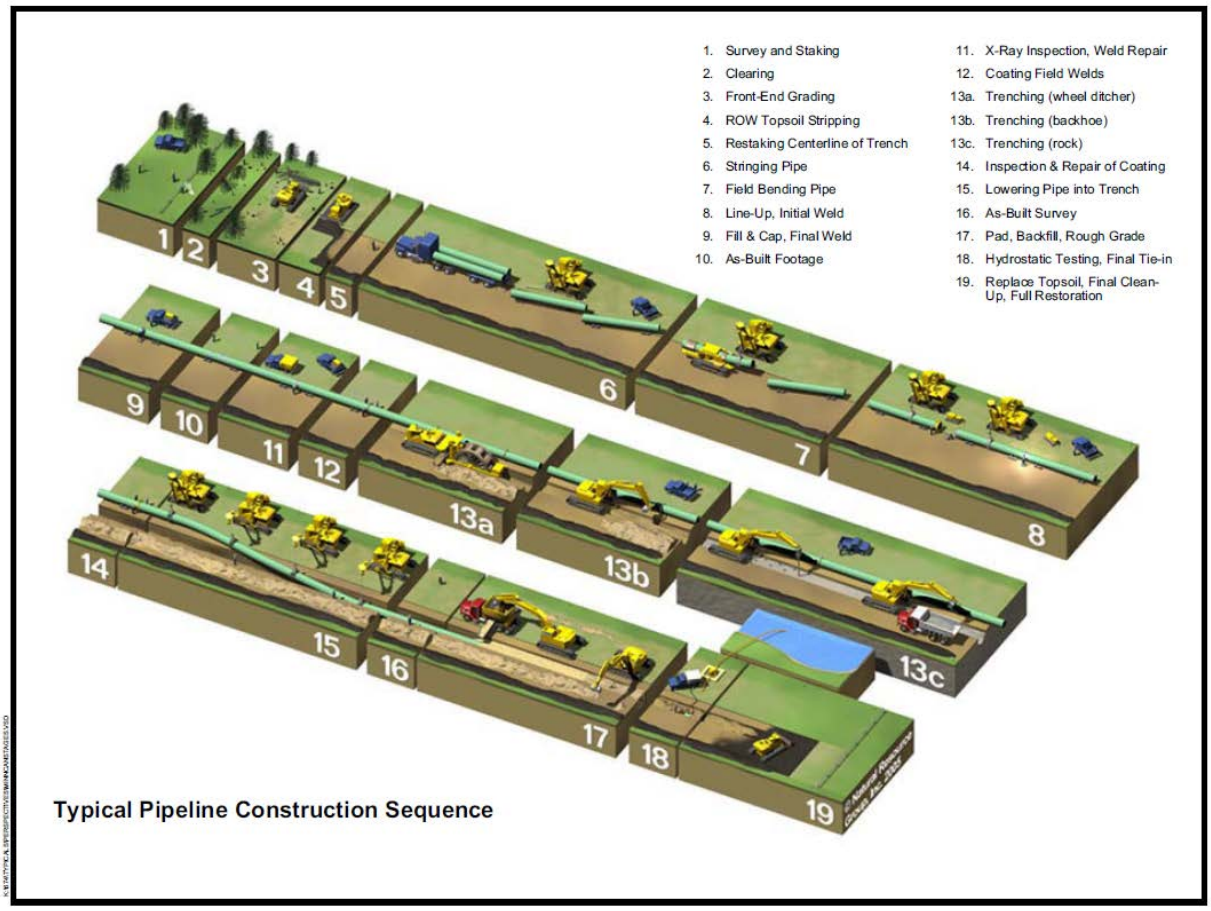

Figure 7-1. Typical Construction Sequence

7.9)Typical Workforce and Equipment

The workforce for this Project is estimated to be approximately 100 personnel per construction spread. This includes managers, laborers, foremen, inspectors, equipment operators, welders, etc. Table 7-2 below provides an estimated list of typical equipment that would be used per spread during construction activities. Further specifics about the number of construction spreads and their composition will be determined after contractor selection and negotiations.

Table 7-2. Typical Equipment List per Spread

Typical Equipment List for each Spread	
Description	Units
1 1/2 yd Trackhoe BH-33	5
1 1/4 yd Trackhoe	7
1 Ton Crew Cab w/Radio	3
2 Ton Flatbed Truck	2

Typical Equipment List for each Spread	
250-375- CFM Air Compressor	5
3/4 Ton Pickup w/Radio	13
4 inch pump	5
Pipe Layers	10
6-20" Bending Machine	1
Construction Office	1
Dozers	4
Enviro Carrier - IC100 EC-22	5
Farm Tractor w/Implements	3
Float Trailer	4
Forklift	3
Fuel Truck	2
Longreach Trackhoe	1
Lowboy Trailer	4
Mechanic Rig	2
Operator Truck	35
Rolligon	5
Rolligon Tow Tractor	4
Rubber Tire Backhoe	1
Sandblasting pot w/hoses	3
Streetsweeper	1
Tac Rig VW-01	1
Tack Rig	1
Tandem Truck	6
Tool Box	10
Utility Trailer	2
Welding Rig	10
Vacuum Excavator	1
EQUIPMENT TOTALS	125
Drill Rigs	
1 million pound rig	1
300,000 pound rig	2
100, 000 pound rig	2
Drill Shack	3
Frac Tank	5
Mud Mixer	3
EQUIPMENT TOTALS	16

Special equipment includes the need for HDD drill rigs. These rigs vary in size depending on the installation and drill requirements. The rigs are described by their thrust/pull-back capacities. So a one-million pound rig has a thrust/pull-back capacity of approximately 1 million pounds. Rigs for this Project are expected to be one-million, 300,000 and 100,000 pound rigs with approximate 765-, 486-, and 225-horse power engines, respectively.

BakkenLink has divided the Project into three distinct construction segments, as shown in Table 7-1. The construction spreads that would be mobilized to install the pipeline would be determined during contractor selection, negotiation and planning phases.
Similarly, specific information about man camps would be determined during contractor negotiations and planning. BakkenLink does not anticipate the creation and/or use of a project specific man camp as commercial camps in the area are expected to be available for use. Pending contractor selection and labor resources, it is expected that a majority of the labor force would come from the local area and will not result in an influx of new, non-local labor and personnel. Oil and gas projects in the Bakken and Three Forks region of North Dakota generally maintain a level of established, local labor, and resources. As projects ramp up and draw down, a phasing of resources occurs where labor no longer needed at one project site could move to another project where additional resources are needed. Because of this mobility of established, local resources, BakkenLink does not foresee an influx of outside labor to the area.

7.10) Workforce Labor/Installation Costs

The estimated construction cost for the BakkenLink Pipeline is approximately $21,165,550 for combined labor and installation costs. Of this total, the approximate combined labor and installation costs by North Dakota Counties are summarized in Table 7-3 below.

Table 7-3. Labor and Installation Costs

County	Combined Labor and Installation Costs
Williams	$7,359,450
McKenzie	$13,806,100
Total	$21,165,550

7.11) Facility Construction

The receipt points provided in Table 2-2 are facilities that are not part of this Project, but are associated with the pipeline system. Two of the three receipt points would be “green field” construction and would require approximately 70 acres of land. **Appendix VIII** provides preliminary process flow diagrams (PFDs). The pipeline scope does include the construction of above ground appurtenances including pig launchers/receivers and MLVs. All facilities and above ground appurtenances will be within the fence lines of the receipt points, except for the mainline valves, which will have impacts as noted in MLV layout typical drawings shown in **Appendix VII**. MLV locations are identified in Table 5-1. In general, the appurtenance facilities for MLVs would be enclosed with chain link fence and have proper egress for operations and maintenance vehicles.

7.12) Access to Right-of-Way

All construction vehicles and equipment traffic would be confined to the public roads, private roads acquired for use by BakkenLink, and the construction ROW. If private access roads are required, BakkenLink and the landowner would reach a mutually acceptable agreement on the route that would be utilized by the Contractor for entering and exiting the pipeline construction ROW should access to the construction ROW not be practicable or feasible from adjacent segments of the pipeline construction ROW, public road, or railroad ROW. If temporary private access roads are constructed, they

would be approximately 12-feet wide, will be designed to maintain proper drainage, and would be built to minimize soil erosion.

All construction-related access roads to the ROW would be marked with signs. Any private roads not to be utilized during construction would also be marked.

BakkenLink would offer landowners or managers of forested lands to install and maintain measures to control unauthorized vehicle access to the construction ROW where appropriate. On federal lands, all travel management will be in accordance with applicable travel management plans, and reviewed/approved by the authorized officer. Measures may include the following unless otherwise approved or directed by BakkenLink and relevant government authority based on site specific conditions or circumstances:

- signs;
- fences with locking gates;
- slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; and
- conifers or other appropriate trees or shrubs across the construction ROW.

7.13) Site Specific Plans and Mitigation

Routing the Project to avoid cultural resources should negate any adverse effects. In the event that an adverse impact may occur, the nature of the impact would be determined and the North Dakota State Historic Preservation Office (SHPO) would be consulted to determine eligibility for listing on the NRHP. If the site is determined eligible, mitigation could include an effort to minimize Project impacts on the resource and/or collection of additional documentation.

BakkenLink has developed an *Unanticipated Discovery Plan* to guide procedures if an unknown cultural resource or human remains are inadvertently encountered during construction. The *Unanticipated Discovery Plan* outlines the framework for handling such discoveries in an efficient and legally compliant manner, and can be found in **Appendix XV**.

In order to minimize the risk of accidental damage from trenching, drilling, or other excavation activities, BakkenLink is currently a subscriber to the state One Call system. Because pipelines are normally buried underground, markers are used to show the approximate, not exact, location of the pipeline.

The Corridor includes crossings of highways, railroads, utility facilities, rivers, woodlands, and wetlands. BakkenLink would implement trenchless technology methods in some of these crossing areas to minimize impacts to sensitive areas. Waterbody and Road Crossing locations, lengths and methodologies are described in **Appendices IX and XX**, respectively. Cropland areas, hay fields and native grasslands would be temporarily disturbed but permanent impacts to the Corridor are not anticipated.

BakkenLink's *Spill Prevention Control and Countermeasure Plan* (SPCC) and *Stormwater Pollution Prevention Plan* (SWPPP) (**Appendices XVI and XVII**) address preventive and mitigation measures that would be used to avoid or minimize the potential impact of hazardous material spills during construction. The Project would be monitored through use of a SCADA system, which would alert operations personnel to any potential leaks. Additionally the communications equipment would be

installed allowing valves to be operated remotely to minimize any potential impacts of a spill. All actuation locations have not yet been determined, and are dependent on operator locations, response times, and protocols based on additional consultation with the Pipeline and Hazardous Materials Safety Administration (PHMSA). Actuators are expected on either side of the Lake Sakakawea Crossing, however, additional locations are pending consultation.

7.14) Safety Requirements

Experienced, well-trained personnel are essential for the successful implementation of this Project. BakkenLink and its Contractors would undergo prevention and response, as well as safety training. The program would be designed to improve awareness of safety requirements, pollution control laws and procedures, and proper operation and maintenance of equipment. The Contractor would provide a minimum one (1) qualified and experienced safety personnel and a minimum one (1) emergency personnel to each construction spread. All work would be conducted in compliance with the Contractor's Safety Plan and Procedures as approved by BakkenLink.

The construction Contractor and all of his subcontractors would ensure that persons engaged in Project construction are informed of the construction requirements and that they attend and receive training regarding these requirements as well as all laws, rules and regulations applicable to the work. Prior to construction, all Project personnel would be trained on environmental permit requirements and environmental specifications, including fuel handling and storage, cultural resource protection methods, stream and wetland crossing requirements, and sensitive species protection measures.

All visitors and any other personnel without specific work assignments would be required to attend a safety and environmental awareness orientation prior to being granted access to any construction sites.

Construction activities would be carried out during daylight hours unless approved by BakkenLink. Burning along the ROW would be controlled and be in accordance with local permits and requirements. Spill prevention measures would be undertaken to maintain the safety of the construction personnel and protect the environment. Access to the ROW would be controlled to allow only authorized vehicles and maintain the safety of the construction crews.

7.15) Emergency Response Plan

After contracts are awarded, a unified Project Safety Plan and Procedures would be developed with the Contractor. All work would be conducted in compliance with the Safety Plan and Procedures. A copy of the Safety Plan would be maintained on site at all times during work. During construction planning, emergency egress and nearest urgent care facilities would be identified and used in the Safety Plan.

7.16) Fire Control Measures

The Contractor would comply with all federal, state, county, and local fire regulations pertaining to burning permits and the prevention of uncontrolled fires. The following mitigation measures would be implemented to prevent fire hazards and control fires:

- A list of local fire authorities and their designated representative to contact would be maintained on site by construction personnel.

- Adequate firefighting equipment would be available on site in accordance with the applicable regulatory requirements.
- The level of fire hazard would be posted at the construction office (where visible for workers) and workers would be made aware of the hazard level and related implications.
- The Contractor would provide equipment to handle any possible fire emergency. This would include, although not be limited to, water trucks; portable water pumps; chemical fire extinguishers; hand tools such as shovels, axes, and chain saws; and heavy equipment adequate for the construction of fire breaks when needed.
- Specifically, the Contractor would supply and maintain in working order an adequate supply of fire extinguishers for each crew engaged in potentially combustible work such as welding, cutting, grinding, and burning of brush or vegetative debris.
- In the event of a fire, the Contractor would immediately use resources necessary to contain the fire. The Contractor would simultaneously notify local emergency response personnel.
- All tree clearing activities would be completed in accordance with local rules and regulations for the prevention of forest fires.
- Burning would be done in compliance with applicable state, county, or local regulations.
- Any burning would be done within the ROW. Only small piles would be burned to avoid overheating or damage to trees or other structures along the ROW.
- Flammable wastes would be removed from the construction site on a regular basis.
- Flammable materials kept on the construction site must be stored in approved containers away from ignition sources.
- Smoking would be prohibited around flammable materials.
- Smoking would be prohibited on the entire construction site when the fire hazard level is high.

7.17) Hazardous Materials

The Contractor would ensure that all hazardous and potentially hazardous materials are transported, stored, and handled in accordance with all applicable regulations. Workers exposed to or required to handle dangerous materials would be trained in accordance with the applicable regulations and the manufacturer's recommendations.

The Contractor would dispose of all hazardous materials at licensed waste disposal facilities. Hazardous wastes would not be disposed of in any other fashion such as un-permitted burying or burning.

All hazardous wastes being transported off-site would be manifested. The manifest would conform to requirements of the appropriate state agency. The transporter would be licensed and certified to handle hazardous wastes on the public highways. Incidents on public highways would be reported to the appropriate agencies. The vehicles as well as the drivers must conform to all applicable vehicle codes for transporting hazardous wastes. The manifest would conform to 49 CFR Parts 172.101, 172.202, and 172.203.

If toxic or hazardous waste materials or containers are encountered during construction, the Contractor would stop work immediately to prevent disturbing or further disturbing the waste material and would immediately notify BakkenLink. The Contractor would not restart work until clearance is granted by BakkenLink or the appropriate agency.

8. Resource Values and Environmental Concerns

8.1) Introduction

BakkenLink has committed to specific environmental protection measures as part of the Project design to minimize potential impacts to natural and human resources during construction and operation. These protection measures are summarized by resource in **Appendix XVIII**. The temporary construction ROW may be reduced in some areas as necessary to avoid impacts to environmentally sensitive areas. In addition, a high consequence area location study would be conducted during the initial design phase of the Project to determine appropriate placement of the valves to minimize environmental impact. For the purpose of this Chapter 8, "Corridor" refers to a one-mile-wide corridor for the entire length of the pipeline, and "Route" refers to the proposed pipeline alignment. Legal descriptions for the Corridor can be found in **Appendix XIX**.

8.2) Public Health and Safety

The Project would be designed, constructed, and operated in compliance with applicable portions of the U.S. Department of Transportation (USDOT) regulations as set forth in 49 CFR Part 195, Transportation of Hazardous Liquids by Pipeline. These regulations encompass general requirements, accident reporting and safety related condition reporting, design requirements, construction, pressure testing, operation and maintenance, qualification of pipeline personnel, and corrosion control. Relevant industry standards are incorporated into these regulations by reference, including those of the American Petroleum Institute (API), American Society of Mechanical Engineers (ASME), and the American Standard for Testing and Materials (ASTM) and others.

8.3) Transportation

Construction operations for the Project would temporarily impact public transportation. Increased truck traffic on adjacent roadways can temporarily be expected and has a documented negative, but manageable, impact on road conditions. The total traffic load on these roadways is expected to be negligible as transportation of oil from wells adjacent to the Project would continue using heavy trucks and truck traffic would increase over time as more wells are installed. Appropriate measures and construction plans (i.e., road signing and warning measures) would be developed by BakkenLink to ensure the safety of all local traffic during construction activities adjacent to public roadways. In addition, all required county and state utility crossing permits would be obtained. All roadways which are paved or comprised of stabilization material would be crossed using HDD as required and to the extent possible, which should serve to greatly reduce impacts to traffic. BakkenLink would also require all contractors to obtain appropriate oversize/overweight permits and follow all state and federal regulations for the transportation of all construction material related to the Project. All road crossing locations, type, and method for crossing are listed in **Appendix XX.**

In addition, construction of the Project would require the construction of temporary access roads along the Route. A list of current roads which would be used for access as well as respective planned improvement for those needing improvement can be found in **Appendix XI**. Landowners would be

contacted in advance to obtain approval if temporary access on private roads is necessary. Placement of temporary accesses would be designed to avoid sensitive features such as wetlands. Areas used for temporary roads or working areas during construction would be restored to their original condition to the extent practicable. All necessary construction road signing and warning measures would also be utilized to ensure the safety of traffic.

8.4) Noise

Noise levels would be greater closer to the Route. The Route is located a minimum distance of 500 feet from existing residences. This would help minimize noise heard along the Route. At 500 feet or greater from the Route, pipeline construction noise would generally be below background noise levels and would be temporary. Post-construction activities would be periodic and noise associated with them would be temporary. Additionally, these activities are similar in nature to operation activities that take place for any existing facilities in the area.

8.5) Visual Impacts

The majority of the Route would be visible to travelers along nearby county roads, as well as local residents. These impacts would be temporary. Impacts to aesthetics are minimized by the placement of the Route along existing road and utility line corridors. Visual impacts along the reclaimed Route would be dependent on the land use in the area. Areas across croplands and hay fields would be rapid in re-establishment, whereas areas on native grasslands would be visible longer following reclamation.

Visual impacts to the Route would diminish in time. Impacts to annual cropland and perennial hay fields are anticipated to have little visibility after the first year. Impacts to native grassland areas would take longer to recovery and may be visible for a significantly longer time following construction, and would be dependent on the reclamation and seasonal conditions following reclamation (**Appendix XIII**). The only long-term visual impacts would be those associated with the two new receipt points, Emergency Response Equipment Storage Areas and MLV sites as attributed to the permanent facilities which would be constructed (**Appendices IV, V, VI, and VII**). Most permanent facilities (i.e., MLV sites) would likely blend in with the existing character of the landscape over time. Mitigation practices would continue through pipeline maintenance and repairs.

8.6) Recreational Areas

Recreational impacts would be primarily visual and limited to individuals using public or private property for hiking, hunting, fishing or nature observation. Public access to the temporary construction ROW would be restricted during construction. Impacts to recreational activities are not anticipated within the Route. Once installed, recreational activities would resume on private and public properties. No designated recreational areas would be converted to non-recreational properties. Mitigation is not anticipated to be necessary.

8.7) Cultural Resources

A Class III Cultural Resource Inventory was performed prior to construction. Cultural resource sites that are unevaluated or have been determined to be eligible for the National Register of Historic Places (NRHP) have been avoided.

BakkenLink has developed an *Unanticipated Discovery Plan* (**Appendix XV**) to guide procedures if unknown cultural resources or human remains are inadvertently encountered during construction. This plan outlines specific procedures for appropriately handling such discoveries in an efficient and legally compliant manner.

8.8)Surface Water

Construction of the Project could affect surface water in several ways. Clearing, grading, trenching and soil stockpiling activities could temporarily alter overland flow. Surface soil compaction caused by the operation of heavy equipment could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for ponding. These impacts would be localized and temporary following proper and sufficient de-compaction during reclamation (**Appendix XIII**).

Environmentally sensitive areas such as wetlands and waterbodies, if necessary and warranted, can be by-passed underground with trenchless methods. When HDD is employed, as listed in Table 10-2, inadvertent releases of drilling fluids and lubricants through seepage may occur, which sometimes can reach surface water(s). BakkenLink has developed an *Inadvertent Returns Contingency Plan* and *Hydrostatic Test Plan*, provided in **Appendices XXI and XIV**, respectively. The Project would be designed and constructed so it would not impede the flow of any waterway. The pipeline would be installed below the bed of the waterway, at a level so the channel bed gradient does not change.

Pipeline crossings would be scheduled at times when there is as little rainfall as possible to minimize the risks of debris, stockpiled soil, and other sources of sediment from being washed into water bodies or wetlands. Temporary erosion and sediment control mitigation or protection measures would be installed across the entire width of the construction ROW, upslope of and on both sides of each waterbody crossing, after clearing and before ground surface disturbance. No silt/turbid discharge water from the trench dewatering operations would be allowed to enter any waterbody or wetland.

If temporary dewatering of groundwater is required during construction activities, water would be discharged in compliance with a National Pollutant Discharge Elimination System (NPDES) permit and the SWPPP. The SWPPP would provide guidance on the location of dewatering structures, resulting in no deposition of sediments into wetlands and water bodies, and no impacts on cultural resources or habitat for sensitive species. The discharge of water from dewatering and hydrostatic testing operations would comply with relevant state discharge guidelines, and would follow the *Hydrostatic Test Plan* in **Appendix XIV**. Effects from dewatering would be localized, temporary, and generally insignificant. The SWPPP is included in **Appendix XVII.**

8.9)Groundwater

Construction activities could temporarily alter overland flow and groundwater recharge. Surface soil compaction caused by the operation of heavy equipment could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for erosion. These impacts would be temporary and localized following proper and sufficient de-compaction during reclamation (**Appendix XIII**).

Some dewatering of construction areas and the pipeline trench may occur; however, relatively small volumes are expected and effects on the overall groundwater system would be small and temporary. Potential impacts on the groundwater would include minor fluctuations in groundwater levels and/or increased turbidity within the aquifer adjacent to the activity. Because of the relatively small amount of

water removed, the short duration of the activity, and the local discharge of the water, groundwater levels would quickly recover after pumping stops.

The greatest risk for impacts to groundwater would result from the accidental release of a hazardous substance during construction or from a release during operations of the pipeline. BakkenLink has developed a SPCC and SWPPP to address preventive and mitigative measures that would be used to avoid or minimize the potential impact of hazardous material spills during construction. The Project would be monitored through a SCADA system, which would alert operations personnel to any potential leaks. Additionally, communications equipment would be installed allowing valves to be operated remotely to minimize any potential impacts of a spill. Expected actuator locations include on both sides of the Lake Sakakawea Crossing, however, additional locations are pending consultation with the PHMSA, with further discussion found in section 7.12. The SPCC is included in **Appendix XVI**.

8.10) Wetlands

The pipeline would be routed to avoid most wetland crossings. Wetlands that cannot be avoided would be crossed using open cut methods and mitigation measures. Standard wetland construction mitigation measures would include reducing construction ROW to 75 feet and limiting equipment working in wetlands to that essential for clearing the ROW, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the ROW. In areas where access to the ROW is only available through the wetland area, non-essential equipment would be allowed to travel through wetlands only if the ground is firm enough, or has been stabilized, to avoid rutting. If rutting is anticipated, non-essential equipment would be allowed to travel through the wetlands only once, and essential equipment would need to be stabilized with prefabricated mats or terra mats. Areas that would be disturbed by excavation, grading, and construction traffic may increase sedimentation into a wetland area. Reasonable efforts would be employed to limit any sediment movement within the Corridor. Following completion of pipeline installation, it is anticipated that there would be no additional impacts on surface wetlands or water quality. Permanent impacts are not anticipated.

Erosion and sediment control mitigation or protection measures would be used during construction, operation, and maintenance of the pipeline to protect topsoil and minimize soil erosion into adjacent wetlands. Vegetation clearing would be limited to trees and shrubs, and excavation would be limited to the pipeline trench only. During clearing activities, sediment barriers would be installed and maintained adjacent to wetland areas and within temporary extra workspaces, as necessary to minimize the potential for sediment runoff.

8.11) Geology

Construction and operation of the Project would not materially alter the geologic conditions of the Project Area. Similarly, the geologic conditions of the area are not expected to affect the installation or operation of the pipeline. Seismic events, such as earthquakes, shocks and tremors have been felt in North Dakota, but have not reached an intensity V or above (Modified Mercalli Scale) in The State's recorded history, according to the USGS. Such events would not be expected to have sufficient forces to damage the pipeline during operation. Should a seismic event occur, pipeline operators generally take precautionary measures to ensure the condition of the system before returning to normal operation.

Landslide data obtained from the North Dakota state geologist's office shows historical landslide fields within the pipeline corridor concentrated in the areas north of Lake Sakakawea, shown in **Appendix**

XXII. Due to the topography of these areas and the potential for future landslides, BakkenLink plans to cross these areas via HDD technology. This method would allow installation of the pipe with minimal impact to the surface geology and provide sufficient depth of cover to prevent the operation of the pipeline to be affected by potential landslides.
Any effects from construction could include disturbances to the natural topography along the ROW, due to trenching and grading activities. Alteration of topographic contours would consist of grading the construction ROW and modification to steeper topographic formations to provide a safe, level working surface for construction equipment. Construction and operation of the Project is not anticipated to have any effect on future mining production, including loss of revenue or diminished mineral land values. No geological hazards are expected to be created.

8.12) Soils

No permanent impacts to the soils in the Corridor are anticipated as a result of pipeline installation or operation, except at those locations where new receipt point facilities are constructed, MLV sites are located, or pig receivers are placed. The location and footprint for all permanent facilities can be found in sections 3.1 and 5.1. The majority of the soil disturbance in the Corridor would be limited to the route but temporary access, staging areas, and temporary workspaces may be needed at select locations.

In order to prevent effects on the soil due to compaction by construction operations, topsoil stripping, and/or soil decompaction techniques would be used during clearing, grading, and restoration activities. Topsoil stripping would occur in the Project ROW above the trench and on both working side and the spoil side of the trench (i.e., the entire width of the construction ROW) along the entire length of the pipeline. In locations where topsoil was not stripped due to specific site-warranted cases, but significant compaction occurred, decompaction measures would be taken, with decompaction measures further described in **Appendix XIII**.

Soil impacts may occur due to wind and water erosion on areas that are disturbed during construction. Wind erosion would be more of a hazard in those portions with coarse-textured soils. Erosion potential can be influenced by the size of area being disturbed at any given time. Because the length of the pipeline would be disturbed in segments during the construction phase, erosion potential would be minimized.

Soils crossed by the Route would be susceptible to contamination from spills or leaks of liquids used during construction. BakkenLink has developed a SPCC (**Appendix XVI**) that would outline methods to reduce spills or leaks. Any contaminated soils would be excavated and removed from the Project area, and the appropriate agencies would be notified as required.

Other impacts may include the mixing of topsoil and subsoil, the potential loss of topsoil due to wind and/or water erosion, and compaction/rutting. The impacts would primarily result from trench excavation and backfilling, and equipment and vehicle traffic along the ROW. Grading may be required in some places to ensure safe working platforms for equipment, as well as to improve access roads (**Appendix XI)**. Generally, these areas would be on steep slopes which are not agriculturally productive.

8.13) Vegetation

Temporary impacts would occur within the Route and where access is needed for Project construction activities. Wooded or forest areas within the Corridor are primarily associated with streams and wind

breaks found near current or former homesteads. Loss of vegetation will occur within the footprint of truck receipt points, MLV sites, and pig receiving sites as discussed in sections 3.1 and 5.1. Any trees along the route would be protected to the extent practicable and in a manner compatible with safe operation, maintenance, and inspection of the pipeline. The construction ROW would be reduced to 50 feet through areas where trees are established, which would help reduce the overall impact to forested areas. Trees would be allowed to re-grow within the permanent easement; however, not within 15 feet of either side of the pipeline.

Existing agricultural and grazing practices along the Route have substantially altered the original vegetative landscape. Minimal impacts are expected to occur to native plant communities. Permanent vegetative impacts from pipeline construction are not anticipated. Temporarily disturbed areas that are normally cultivated would be available after Project construction. Areas not currently in agricultural use would be seeded with native seed mixes per USACE, USFS, USFWS, and NRCS recommendations, or as otherwise negotiated with private landowners.

BakkenLink would work closely with landowners to minimize adverse impacts to vegetation associated with construction of the pipeline. A survey would be conducted to document tree species and numbers that would be impacted by Project construction. Trees and shrubs would be replaced in accordance with the PSC's tree and shrub mitigation specifications; and as required by other governing agencies. Generally, BakkenLink would conduct an inventory of trees and shrubs that would be removed during construction of the pipeline. Trees and shrubs would be replaced by the same species or similar species suitable for North Dakota growing conditions at a 2:1 replacement ratio. The replacement location(s) would be coordinated with the landowner(s). Documentation identifying the number, variety, type, location, and date of the replacement plantings would be filed with the PSC. Monitoring of the survival rate and overall condition of the plantings would be conducted for three years. If the survival rate is 75% or less, the PSC may require additional plantings. A copy of the PSC *Tree and Shrub Mitigation Specifications*, the BakkenLink *Tree and Shrub Inventory Sampling Plan*, and *USACE SOP #14 –Garrison Project Tree/Vegetation Mitigation* are included as **Appendix XXIII, XXIV, and XXV**, respectively.

8.14) Wildlife

Impacts to wildlife would include modifications to habitat, and an increase of human activity in the area. Activities may result in temporary displacement of wildlife in the area and the disturbance of avian nest locations. The Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703-712) protects bird species, including, but not limited to, cranes, ducks, geese, shorebirds, hawks, and songbirds and their nests. These impacts would be temporary and permanent impacts are not anticipated. Activities closer to the construction would be more concentrated, and may temporarily displace nesting birds and wildlife, or destroy nests. The impact on terrestrial wildlife would be short-term and minimal, and permanent impacts are not anticipated.

To protect species protected under Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act, a presence/absence survey for active nests would be conducted prior to construction. To minimize impacts, migratory birds and nests would be avoided during construction and operation of the pipeline. Any wildlife encountered during work activities would be avoided to the extent possible. Clearing and grubbing of the Project ROW would occur in the fall or early spring to discourage bird nesting. In the event clearing and grubbing of the ROW is not possible prior to the nesting season, nesting surveys for migratory birds would be conducted where suitable nesting habitat exists prior to construction. If active

nests are encountered on the ROW, the USFWS would be consulted for instructions on avoidance and/or mitigation measures. Consultation with the USFWS regarding nesting avian species would be continued during construction activities.

Surveys for raptor nests and sharp-tail grouse lek locations were conducted along the Corridor in the spring of 2012, 2013, and 2014. The methods and results of the surveys are discussed in the *Raptor and Prairie Grouse Survey Spring 2012-2013* and *Raptor and Prairie Grouse Survey Spring 2014* reports included in **Appendix XXVI**. A raptor and migratory bird survey will be conducted five days prior to construction, if construction occurs during the nesting season (February 1 and July 15). However, if the ROW is mowed or cleared of vegetation outside of the nesting season (July 16 and January 31) and vegetative growth is inhibited until commencement of construction activities, then pre-construction migratory bird surveys would not be required.

8.15) Rare and Unique Natural Resources

Adverse impacts to threatened and endangered species are not anticipated. Seven USFS-sensitive plant species populations have been identified within the construction ROW. Consultation with the Forest Service is on-going regarding avoidance measures. If during construction, additional threatened and endangered species and/or their nests are encountered, construction would be halted and the USFS and USFWS would be notified and consulted for additional information on how to proceed. The proposed Corridor does not include any areas designated as Wildlife Management Areas (NDGF 1999) or USFWS Waterfowl Production Areas.

8.16) Noxious Weeds and Aquatic Nuisance Species

Noxious weeds are opportunistic and often exotic (non-indigenous) plant species that readily invade disturbed areas, often producing monocultures and preventing native plant species from establishing communities. Noxious weeds also degrade agricultural productivity, soil and water, wildlife habitat, and recreational and wilderness values.

The North Dakota Century Code (NDCC) §4.1-47-01(6) defines noxious weeds as any plant propagated by either seed or vegetative parts which is determined by the commissioner, a county weed board, or a city weed board, after consulting with the North Dakota State University Extension Service, to be injurious to public health, crops, livestock, land, or other property. Currently, there are eleven species or species groups (some include more than one species and/or cultivars) in North Dakota (North Dakota Administrative Code §7-06-01-02). Pursuant to NDCC 4.1-47 the control and the spread of noxious and invasive weeds is mandatory, and dissemination of noxious weeds must be prevented.

Biological surveys for noxious weeds were conducted during 2011 to determine their occurrence along the proposed ROW. A survey for these species was completed in the 2014 field season. The surveys focused on a 200-ft wide corridor centered on the Project centerline. Noxious weed locations and the extent of localized populations were delineated and recorded using global positioning system (GPS) equipment. Resulting maps showing the current, known locations of noxious weeds along the ROW are depicted in **Appendix XXVII**.

Aquatic nuisance species (ANS) have not been identified in any of the waterbodies or wetlands crossed by the Project. However, BakkenLink will ensure that proper mitigation measures be implemented during construction to prevent the spread of ANS.

Monitoring of noxious weeds would be conducted as part of on-going O&M inspections. BakkenLink would maintain ongoing communication with individual landowners, counties, and land management agencies regarding noxious weeds. These parties would also be supplied with BakkenLink contact information to report noxious weeds along the ROW. BakkenLink would maintain operations personnel trained in the identification of noxious weeds, who would contribute to monitoring reports by documenting noxious weeds observed during the normal course of O&M.

Monitoring would continue for a period of three (3) years after any ground disturbance takes place. Monitoring would be conducted on an annual basis, or as needed following a report of an infestation. Known infestation sites would be monitored on an ongoing basis or until noxious weeds at the site are controlled. BakkenLink shall be responsible for reimbursing all reasonable costs incurred by owners of land adjacent to aboveground facilities when the landowners must control weeds on their land that can be reasonably determined to have spread from land occupied by BakkenLink's aboveground facilities.

BakkenLink would comply with State of North Dakota, County, and federal agency requirements implemented to prevent the spread of noxious weeds and ANS. BakkenLink would implement weed control measures in areas of the Project right-of-way (ROW) where noxious weeds have been identified. Monitoring during construction and O&M would include the identification of areas along the ROW where noxious weeds are present. Monitoring would also include an evaluation of the prescribed control measures in their effectiveness of control. A *Noxious Weed Control Plan* was developed and can be found in attached **Appendix XXVII**.

9. Interim and Final Reclamation

9.1) Reclamation

During construction activities, the Contractor would limit ground disturbance wherever possible and use appropriate erosion and sediment control measures. Disturbed areas would be restored to their original contours and condition to the extent practical, unless landowner consent is obtained to do otherwise. Post-construction reclamation activities include, but are not limited to; removing and disposing of construction debris; dismantling temporary facilities; leveling or filling tire ruts; relieving compaction, rock removal, soil additives, seeding and mulching; erosion control measures including trench breakers, slope breakers, matting and riprap; installing fences, farm terraces, and ROW and pipeline markers , and reseeding non-cultivated areas. The CMRP can be found in **Appendix XIII.**

9.2) Waterbody Crossing Stabilization Plan

Sediment barriers would be installed before initial disturbance of the waterbody or adjacent upland. Sediment barriers would be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. Erosion control matting would be placed on the banks for flowing streams where vegetation has been removed. Matting would extend three feet past the upper edge of the high water mark. If an interceptor dike is present on the approach slope, the matting would begin on the uphill side of the interceptor dike. Matting would be installed across the slope in the direction of the water flow. Double six inch staples would be used every twelve inches before the trench is backfilled and compacted. The matting would be trenched and rolled down the hill with double staples every twelve inches before the trench is backfilled and compacted. The edges of parallel matting would be

overlapped at a minimum of six inches. The upper matting would be placed over the lower matting shingle style and stapled every twelve inches along the length of the edge. Staples would be placed down the center of the matting with three staples in every square yard. In livestock areas, fencing would be used to exclude livestock, with permission of the landowner. Washouts, staple integrity and mat movement would be monitored and replaced as necessary.

9.3)Revegetation

The final seed mix(s) would be based on input from the local NRCS office or managing agency and the availability of seed at the time of reclamation. The landowner may request specific seeding requirements during easement negotiations. All seed would be State of ND Certified or Registered seed (or certified/registered by the state of origin), with certification tags shall be made available to the authorized officer or environmental inspector before seed is planted to limit the introduction of noxious weeds. Seed would be applied at the rate recommended by the managing agency or NRCS. Seeding rates would be based on pure live seed. The Contractor would plant seed at depths consistent with the local or regional agricultural practices.

Post-construction monitoring inspections would be conducted annually for 5 years on USFS and USACE unless successful revegetation occurs sooner. Reclamation monitoring on private land would occur annually for 3 years. Additional information pertaining specifically to tree and shrub revegetation can be found in section 8.13. Areas which have not been successfully re-established would be revegetated by BakkenLink or by compensation of the landowner to reseed the area. If revegetation is successful, additional vegetation monitoring along the Project ROW would consist only of monitoring for noxious weeds and trees and shrubs as described in section 8.13 and 8.16, respectively.

10. Operation and Maintenance

10.1) Operation and Maintenance

After pipeline construction has been completed, BakkenLink's operator would be responsible for monitoring and inspecting the operation of the pipeline as well as maintenance and repair in accordance with the *Integrity Management Plan* (IMP). Leak detection and monitoring systems compliant with API 1130 would be employed utilizing the measuring equipment at the inlet and outlet to the pipeline, which would be interconnected with a SCADA system connected to a central operations center (control room).

Specialized coating for underground pipelines and a cathodic protection system would be utilized to prevent external corrosion. An impressed current style cathodic protection system would be installed on the pipeline. Rectifiers and deep well anode beds are anticipated to be installed at approximately 15 mile intervals. The exact locations would be confirmed with geotechnical testing and availability of commercial electrical power. The deep well anodes would have a minimum 20 year life and the assembly would be designed to allow the anodes to be replaced at the end of the design life to extend the operational life of the pipeline. The rectifiers would be sized to allow sufficient adjustment to compensate for varying conditions. In accordance with 49 CFR, Part 195 the rectifiers would be inspected at least 6 times per calendar year. The pipeline potential would be recorded at every test station (approximately 1 mile intervals) every calendar year. A close interval survey, providing a pipeline potential measurement every 3 ft, would occur every 7 years or more frequently in critical areas identified in the IMP.

Because pipelines are normally buried underground, markers are used to show the approximate – not exact – location of the pipeline. The markers also display the name of the pipeline operator, the product transported in the line, and a telephone number where the operator can be reached in an emergency. Appropriate markers and security fencing would be installed, as necessary.
The following measures would be implemented to prevent or mitigate any adverse effects resulting from the Project operations:

- BakkenLink would follow a written manual of procedures for conducting normal operations and maintenance activities and for handling abnormal operations and emergencies. The manual would delineate the responsibilities of both management and operating personnel and would be reviewed each calendar year to insure it remains effective. The manual would include provisions that address the following:
    - Retention of important construction, operation and maintenance records, including records of pipeline and equipment inspections.
    - Procedures for reporting spills, accidents, and safety related conditions.
    - Identification of sensitive areas along the Project route that would require an immediate response to prevent hazards to the public if the facilities failed or malfunctioned.
    - Procedures for receiving, identifying and classifying notices of events which need immediate response by Project personnel or notice to fire, police or other appropriate public officials.
    - Establishing and maintaining liaison with fire, police and other appropriate public officials. Procedures would be included for notifying these officials of pipeline emergencies and coordinating with them pre-planned and actual responses during such emergency.
    - Maintaining a list and contact information of area contractors that may be used to respond to a spill or emergency.
- A SCADA system would be installed on the pipeline system. Pressures and flow rates would be monitored at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be discussed immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance.
- A continuing training program would be implemented to instruct personnel in safely carrying out the operations, maintenance and emergency procedures related to their assignments. This would include instruction on the characteristics and hazards of the crude oil being transported, the recognition of conditions that are likely to cause emergencies, and the steps necessary to control or minimize the impacts of an accidental release.
- In addition to observation by operating personnel, aerial (or ground) patrols would be used to inspect the surface conditions on or adjacent to the Project ROW. The frequency of inspection would be approximately every two weeks (26 times per year).
- A damage prevention program would be established to prevent damage to the pipeline from excavation activities or other encroachments on the ROW. The damage prevention program would include membership in one or more “One-Call” systems in North Dakota that provide prior notification when excavation by third parties is to occur near the Project.

ROW and access roads are to be inspected at intervals and with methods in accordance with the operator’s protocols. Access to the ROW would be controlled so that only authorized vehicles are allowed access and only for authorized purposes, including inspection and maintenance operations.

10.2) Hydrostatic Testing and Water Management

BakkenLink is responsible for acquiring all permits required by federal, state, and local agencies for procurement of water and for the discharge of water used in the hydrostatic testing operation. BakkenLink would provide the Contractor with a copy of the appropriate withdrawal/discharge permits for hydrostatic test water, which would be kept on site at all times during testing operations. BakkenLink acknowledges the potential for additional water volumes to be required for dust control during construction activities. Dust control measures would be maintained by construction contractors and guided by best management practices. Water volumes and sources would be determined based on site-specific requirements but water use and sourcing would be pursuant to government regulations and relevant permits.

Any water obtained or discharged would be in compliance with permit notice requirements and with sufficient notice for BakkenLink's Testing Inspector to make water sample arrangements prior to obtaining or discharging water. BakkenLink would obtain water samples for analysis from each source before filling the pipeline. In addition, water samples would be taken prior to discharge of the water, as required by state and federal permits.

Currently, no specific hydrostatic test water sources have been identified but details about the sources and quantities from each source are to be determined at a later date and the relevant agencies would be notified. Similarly, discharge locations would be determined by site-specific conditions. Environmentally sensitive areas would be avoided for water discharge. Water discharge would be in upland areas and no water discharge would occur within 500 feet of waterbodies. Appropriate erosion mitigation measures and energy dissipating devices would be employed where discharge occurs. Water sources and discharge locations would comply with regulation and permitting requirements and would be disclosed to the relevant agencies.

In some instances sufficient quantities of water may not be available from the permitted water sources at the time of testing. Withdrawal rates may be limited as stated by the permit. Under no circumstances would an alternate water source be used without prior authorization.

The tables below describe the estimated water volume required for hydrostatic testing activities. The tables are broken down into volumes necessary for the pipeline hydrostatic test based on construction spreads of the entire line and additional HDD testing volumes.

Table 10-1. Hydrostatic Test Segments and Estimated Water Volumes

Seg. #	Segment Break Sections	Approx. MP		Segment length (ft)	Water Volume (gal)	Source	Proposed Discharge Locations (Approx. MP)
1	Dry Creek Terminal - South Lake Sakakawea	0	22.8	120,384	1,161,217	TBD	0
2	Lake Sakakawea	22.8	25.6	14,784	140,278	TBD	25.6
3	North Lake Sakakawea – Beaver Lodge	25.6	37.4	60,720	585,702	TBD	37.4
	Total			195,888	1,887,197		

Table 10-2. HDD Segments and Estimated Hydrostatic Test Water Volumes

HDD Sections	Approx. MP	Segment length (ft)	Water Volume (gal)	Source	Proposed Discharge Locations (MP)
Lake Sakakawea – North Bluff	26.2	3,050	28,940	TBD	26.17
Lake Sakakawea – South Bluff	22.0	3,767	35,743	TBD	22.01
United States Forest Service	20.2	4,183	39,690	TBD	20.24
Totals		11,000	104,373		

The total water use for the hydrotesting and drilling operations is estimated in Table 10-3 below. The estimate reflects water volumes needed for the Trunkline hydrostatic test, HDD pre-installation hydrostatic tests and drilling operations independently. It is possible the water amounts can be reduced if the water is reused between tasks. For example, water used during HDD pre-installation hydrostatic test could be stored, filtered and reused for mixing in the drilling mud. However, the table below does not account for any reuse of water.

Table 10-3. Total Water Usage

Water Usage	Water (gallons)
Hydrostatic Test Total	1,887,197
HDD Pre-installation Hydrostatic Test Total	104,373
Water for Drilling Operations Total*	775,521
Water Totals	2,767,091

*Water use in drilling operations provided in BakkenLink *Inadvertent Returns Contingency Plan*

10.3) ATMOS Monitoring Technology

ATMOS Pipe Leak Detection System, a system that gathers all of the pressure data collected and sends it back to the central SCADA system for detailed filtering and analysis. ATMOS Pipe Leak Detection System uses pressure data to examine all aspects of a potential negative pressure wave front and its propagation through the pipeline to three-dimensionally map time, distance, and wave intensity. This allows the system to accurately detect true leak events from the pressure changes caused by transient operation. If a leak occurs, the system generates an alarm within 2 to 5 minutes and allows location of the leak within 1 to 2 percent of the distance between pressure sensors.

11. Termination and Restoration

11.1) Removal of Structures

BakkenLink has consulted with various federal, state, and local governments, several energy infrastructure projects near the Project area, as well as local businesses and residents, and has not identified any conflicts with proposed developments in the vicinity of the Project. Where above ground structures such as fences and roadways are affected by pipeline installation activities, the Contractor would mitigate damages where possible and restore any removed structures to a state acceptable to BakkenLink and the landowner.

Prior to the completion of construction activities, BakkenLink would ensure that the BLM authorized officer has access to review and inspect vegetation and restoration activities along the ROW. BakkenLink and its contractors would be responsible for the removal of temporary construction facilities, structures or surface materials, reclamation of the original grade contours and restoration of disturbed areas to a state similar to pre-construction conditions.

12. Appendices

I. Additional Temporary Construction Workspace Locations/Acreage
II. Typical Right-of-Way and Temporary Construction Workspace Drawings
III. Typical Construction Drawings
IV. Dry Creek Terminal Connect Detail
V. Keene Receipt Point Connect Detail
VI. Beaver Lodge Connect Detail
VII. Mainline Valve Typical Site
VIII. Facility Typical and Preliminary Process Flow Diagram Schematics
IX. Waterbody Crossings
X. Lake Sakakawea Crossing
   A) Lake Sakakawea Crossing - Report, Methodology, Maps, Soil Report, CWC Protection, Equipment Lowering (Sections A-F)
   B) Lake Sakakawea Crossing - HDD Crossing Report
   C) Lake Sakakawea Crossing – Addendum to Phase I Report
XI. Access Road and Improvements Table
XII. Construction Segment Map
XIII. Construction Mitigation Reclamation Plan (CMRP)
XIV. Hydrostatic Test Plan
XV. Unanticipated Discovery Plan
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XVII. Stormwater Pollution Prevention Plan (SWPPP)
XVIII. Summary of Protection Measures
XIX. Legal Corridor Description
XX. Road Crossings and Methodology
XXI. Inadvertent Returns Contingency Plan
XXII. Landslide Map
XXIII. Tree and Shrub Mitigation Specifications
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XXV. USACE SOP #14 – Garrison Project Tree/Vegetation Mitigation
XXVI. Raptor and Prairie Grouse Survey
XXVII. BakkenLink Noxious Weed Control Plan
XXVIII. Paleontological Plan