

Alexander Tank Farm Crude Oil Pipeline

McKenzie County

Pipeline Route Application

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INTRODUCTION

Hiland Crude, LLC (“Hiland”), submits this Route Permit Application to the North Dakota Public Service Commission (“Commission”) for the conversion of an approximately 4.5-mile-long, 8-inch existing crude oil gathering pipeline to a transmission line. The pipeline is located in McKenzie County, North Dakota and is known as the Alexander Tank Farm Crude Oil Pipeline (“Alexander Pipeline”), which is an extension of the Market Center pipeline system (“Market Center System”). Because of the interconnection with the Market Center System, and the status of the Market Center System as a gathering line at the time of planning and construction for the Alexander Pipeline, the Alexander Pipeline was initially constructed as a gathering line.

At the time the Alexander Pipeline was constructed, the Market Center System was the only system capable of gathering crude oil from lease sites in Williams, McKenzie, and Mountrail Counties, North Dakota, with connections to transmission pipelines capable of transporting crude oil to refineries located on the Gulf Coast, without utilizing truck or rail transport. In conjunction with the Market Center System, the Alexander Pipeline was originally designed and constructed to serve delivery points at Alexander Station in conformance with gathering line activities.

However, now that the Market Center System has been approved for conversion to a transmission pipeline (Case No. PU-13-136), Hiland desires to convert the 4.5-mile-long lateral segment of the Alexander Pipeline to a transmission line to allow for delivery of crude oil passing through the Market Center System or alternatively to allow for transport of crude oil from Alexander Station to the Market Center System.

Hiland is cognizant of the fact that it should have foreseen the conversion of the Market Center System to a transmission line affecting the jurisdictional status of the Alexander Pipeline. However, due to the timing associated with the conversion application of the Market Center System to a transmission line and the planned construction of the Alexander Pipeline, Hiland did not include this small pipeline as part of the Market Center System conversion filing.

Hiland now seeks to remedy the matter of the Alexander Pipeline being built as a gathering line and receive Commission approval for utilization of the Alexander Pipeline as a transmission line. In accordance with Chapter 49-22 of the North Dakota Century Code, Section 69-06-08-02 of the North Dakota Administrative Code, and the Commission’s Energy Conversion and Transmission Facility Siting Guidelines, Hiland provides the following information to support its request for a Route Permit for the Alexander Pipeline.

SECTION A DESCRIPTION OF PROPOSED FACILITY

A.1 Type of Facility

The Alexander Pipeline consists of an existing 8-inch, 4.5-mile-long underground crude oil gathering pipeline. As presently constructed, the Alexander Pipeline originates five miles north-northeast of Alexander, North Dakota at a connection with the Market Center System and runs 4.5 miles north to Hiland’s Alexander Station. The Market Center System touches a significant number of major crude oil rail and pipeline networks in northwestern North Dakota.

The purpose of the Alexander Pipeline is to transport crude oil from smaller crude gathering systems and truck facilities to existing rail and pipeline network destinations. Upon conversion

to a transmission line, the Alexander Pipeline will enable the transportation of crude oil produced in northwestern North Dakota to multiple shipping points for out of state sale.

As initially constructed, the Alexander Pipeline provided another outlet for crude oil collected by Hiland's Market Center System to various facilities at Alexander Station. If conversion is allowed, Hiland may reverse crude flow and use pump facilities from Alexander Station storage in the future, should its customers desire to transport crude oil from the Alexander Station to the Market Center System. Small fenced-in enclosures to house associated power and control systems were installed to allow some valves to be operated remotely. Figure 1.A.1 shows the general location of the Alexander Pipeline.

The total cost of the Alexander Pipeline was approximately \$3.6 million.

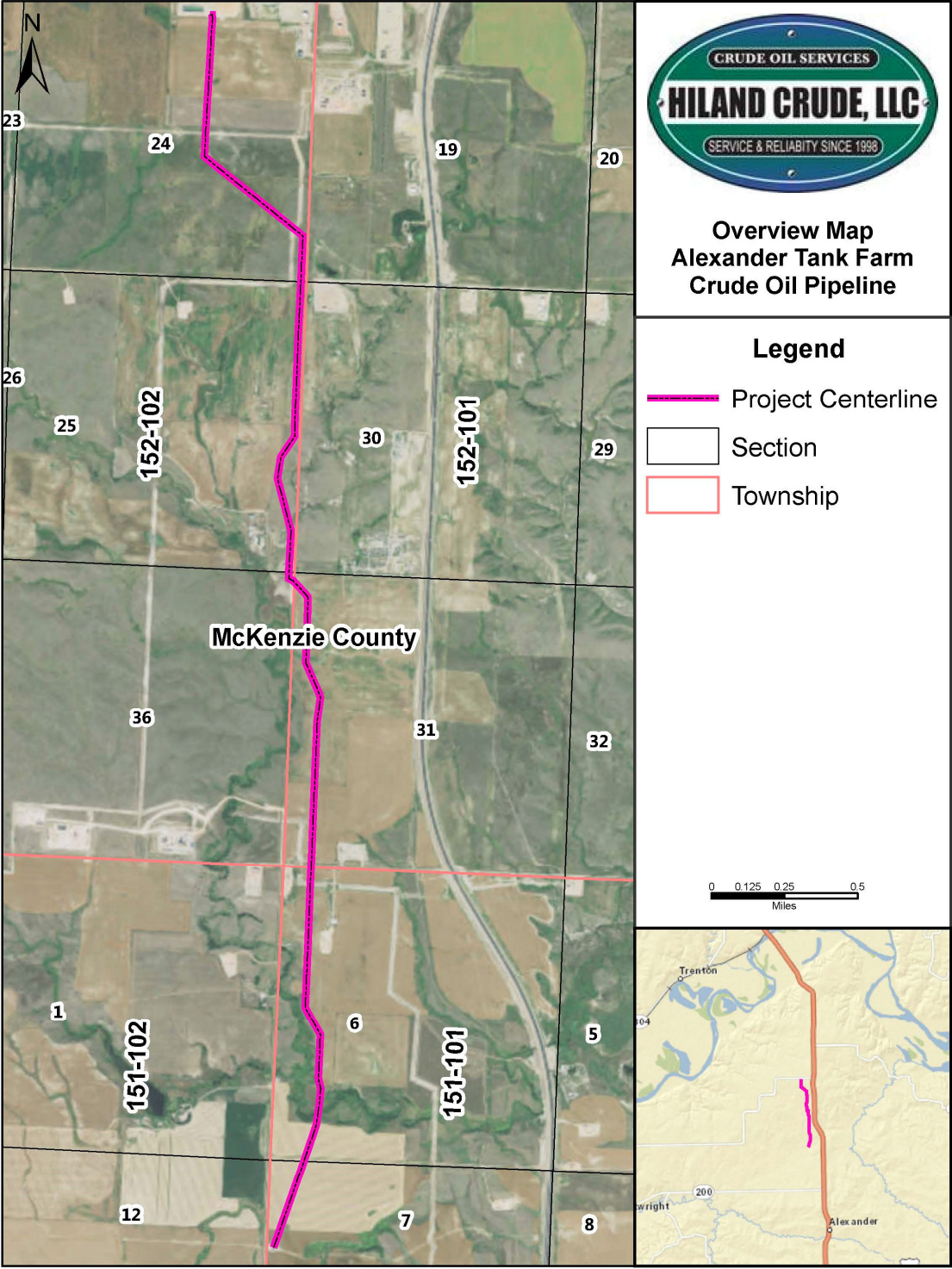


FIGURE 3.A.1 – General Project Location Map

A.2 Product

Upon conversion to a transmission line, the Alexander Pipeline will provide pipeline transportation for produced crude oil. Historically Hiland has operated a light sweet common stream system and Hiland will continue to accept sweet crude into its common stream. This specification is consistent with the quality of crude oil produced from the Bakken formation, which is currently the largest exploration play in the region.

A.3 Size and Design

Construction of the Alexander Pipeline as a gathering line involved the installation of 8-inch nominal diameter carbon steel pipeline with a nominal wall thickness of 0.188 inches with fusion bonded epoxy ("FBE") coating denoted as American Petroleum Institute ("API") Code 5L specification X52 pipeline pipe. For bored crossings, 0.252 inch wall thickness FBE coated pipe was used. Upon conversion of the gathering line to a transmission line, the maximum temperature of the crude will be 120°F, which is within design parameters. However, the Alexander Pipeline will typically operate between 60°F and 120°F.

The Alexander Pipeline was installed using 8-inch ANSI 600, flange end by flange end, full port, rising stem gate valves and similar ball valves. Valves were manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." The maximum operating pressure ("MOP") of the valves is 1,440 pounds per square inch gauge ("psig").

The carbon steel pipe utilized for the Alexander Pipeline meets United States Department of Transportation ("US DOT") regulations, specifically the design criteria outlined in the Code of Federal Regulations ("C.F.R."), Title 49, Subpart 195(C). The Alexander Pipeline was constructed per 49 C.F.R. Subpart 195(D). Upon conversion to a transmission line, the Alexander Pipeline will be operated and maintained per 49 C.F.R. Subpart 195(F).

A.4 Time Schedule

Hiland proposes to develop the Alexander Pipeline on the following time schedule:

A.4 (a) Certificate of Corridor Compatibility

The Certificate of Corridor Compatibility Application is being submitted in July 2015 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (b) Route Application

The Route Permit Application is being submitted in July 2015 as part of this Consolidated Certificate of Corridor Compatibility and Route Permit Application.

A.4 (c) Right-of-Way Acquisition Date

Right-of-Way ("ROW") acquisition was completed prior to construction of the Alexander Pipeline.

A.4 (d) Issuance of Certificate of Corridor Compatibility and Route Permit

A Certificate of Corridor Compatibility and a Route Permit for the Alexander Pipeline are expected to be issued in September of 2015.

A.4 (e) Construction Start Date

Activities associated with the transmission approval will begin on or around December 1, 2015, upon Commission approval.

A.4 (f) Construction Complete

There are no anticipated construction activities as part of this conversion filing.

A.4 (g) Test Operations

There are no anticipated construction activities as part of this conversion filing.

A.4 (h) In-Service Date

All facilities associated with the gathering line were put into service in June of 2014. Activities associated with the transmission approval will be in-service by December 2015, upon approval by the Commission.

SECTION B ROUTE ANALYSIS AND STUDIES

A number of criteria, including but not limited to the criteria required by Section 69-06-08-02 of the North Dakota Administrative Code, were considered in evaluating the location of the Alexander Pipeline route, specifically: Exclusion and Avoidance Areas, Selection and Policy Criteria, Design and Construction Limitations, Economic Considerations, Human Environment, Soils, Vegetation/Wildlife, Land Use, Water Resources, and Cultural Resources. Each criterion is discussed in detail, including descriptions, potential impacts, and mitigation measures where appropriate, in Section B involving analysis and studies, or in Section C regarding siting criteria.

Analysis of the Alexander Pipeline entailed both desktop studies and field surveys. A 1-mile-wide study corridor was utilized for the entire route, with the exception of soils that were studied using a 75-foot-wide corridor (“study area”). Surveys were conducted along the entire route in the field from either helicopter or on foot within the specified survey corridor (“survey area”). Survey areas ranged from 250-foot-wide to 1-mile-wide, depending on the survey subject. Survey corridor widths are as follows: 250-foot-wide Class III survey corridor for cultural resources, 500-foot-wide survey corridor for vegetation, 1-mile-wide survey corridor for raptors, and a 1-mile-wide survey corridor for wildlife.

The Alexander Pipeline route has been superimposed on both aerial photographic maps as well as U.S Geological Survey (“USGS”) Topographic Maps that are presented in Tab 4 as Appendix 4.B, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

B.1 Location

B.1 (a) Hiland’s Policies and Commitments to Limit Environmental Impact

Hiland works to protect the environment, home to its employees and customers. Protection of the environment is an integral element of Hiland’s enterprises. Environmental protection efforts span every phase of the Alexander Pipeline, from planning through construction, restoration, and into full operation.

B.1 (b) Construction

Construction of the existing Alexander Pipeline included an 8-inch carbon steel pipe and launcher/ receiver facilities at Dore Junction and Alex Station in a newly acquired ROW located in McKenzie County, North Dakota. Construction resulted in temporary short-term impacts, but did not result in significant long-term changes to the environment.

The permanent ROW for the Alexander Pipeline is 50 feet wide. During construction an additional 25 feet of temporary workspace was utilized for material staging and temporary access roads. Hiland used existing public roads to access the 75-foot-wide construction ROW, and did not modify roads or create new permanent access roads.

Environmental inspections were conducted during and following construction of the Alexander Pipeline. Environmental training was provided to the construction manager, who then trained construction inspectors on environmental requirements. Inspectors monitored compliance with required environmental protection measures and specifications, and provided ongoing oversight of day-to-day issues. Inspectors were well-versed in the implementation of environmental best management practices during construction. Construction specifications incorporated

environmental protection and mitigation measures, which were implemented in the field. Contractor training and project orientation were provided by Hiland.

Section D of this application further discusses mitigation measures implemented for planning, design, construction, and restoration of the Alexander Pipeline.

The Alexander Pipeline is located primarily on private land. Landowner concerns were addressed during all phases of construction for the Alexander Pipeline, including final restoration. Land agents assigned to the Alexander Pipeline worked closely with landowners to the extent practicable, and responded to issues that arose during the course of the Alexander Pipeline. Permission from all private land owners was obtained prior to construction of the Alexander Pipeline.

A small parcel of North Dakota State land was crossed by the Alexander Pipeline, totaling less than 1 percent of the total length of the original gathering system. No new facilities are proposed on State lands at this time. However, if additional capacity is sought in the future, additional pipeline construction may involve State lands.

B.1 (c) Ongoing Pipeline Operation

Hiland has a continuing commitment to conduct its operations in an environmentally responsible manner. Substantial, continual effort is placed on pipeline integrity, operational safeguards, emergency response, and landowner relationships, all of which reduce the impact of the Alexander Pipeline on the environment. Additional information regarding operations and safety is provided in Section G.3.

B.1 (d) Energy Conservation Considerations

Conversion of the Alexander Pipeline to a transmission line will expand Hiland's service area while improving crude oil delivery destination options for system shippers.

The key energy economic impact will be the substitution of the most energy efficient mode of crude oil transportation, i.e., pipeline, for the least efficient mode of transportation, i.e., on-road transport via cargo tanker truck. The maximum potential flow rate of the Alexander Pipeline will be 50,000 barrels per day ("bbls/day").

Beyond the direct energy benefit of using an efficient mode of transportation (e.g., a pipeline), energy conservation is a major concern at Hiland. Energy and power costs represent the largest single recurring expense in pipeline operation.

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

B.2 Human Environment

The Alexander Pipeline study area is sparsely populated, with ranching and farming as the predominant economic activities. The pipeline route crosses land owned by 8 different landowners. The route does not pass through parks or recreational areas.

The Alexander Pipeline route passes within 500 feet of one residence. Hiland is obtaining a waiver from this residence, which is located approximately 350 feet from the existing pipeline. See Section C.4 involving avoidance areas for a more detailed discussion.

The majority of the Alexander Pipeline route is located on private land. Landowner concerns and routing preferences were addressed during the establishment of easement agreements and through all phases of construction, including final restoration, of the Alexander Pipeline. Land agents assigned to the Alexander Pipeline worked closely with landowners and were responsive to issues that arose during construction of the gathering line to the extent practicable. Hiland has finalized easement agreements with all landowners along the route.

No municipal water supplies or production water wells were identified within the study corridor.

A small portion of the Alexander Pipeline as constructed is located on land under the jurisdiction of the State of North Dakota. However, no permanent population resides in this area.

The Alexander Pipeline does not transect any U.S. or North Dakota highways. The pipeline crosses three gravel roads which were crossed via horizontal directional drilling or boring. Through traffic was not disrupted during the boring process. Two two-track vegetated trails were temporarily impacted by open cut during construction.

Road crossings for the route are summarized in Table 3.B.1.

For construction of the Alexander Pipeline, all roads and section line crossings were subject to review and approval by the County Engineer and County Commission. Necessary applications were submitted and permits obtained for the road crossings prior to the start of construction.

TABLE 3.B.1 – Alexander Pipeline Road Crossings

Legal Description	Coordinates	Road Name	Description of Road
McKenzie County			
Section 7 T152N R102W	47.956610, -103.669047	144 th Ave	Two Track
Section 36 T152N R102W	47.949497, -103.669087	37 th St	Gravel
Section 31 T152N R101W	47.935192, -103.666572	36 th St	Gravel
Section 6 T151N R101W	47.924227, -103.665177	Unnamed	Two Track
Section 6 T151N R101W	47.920727, -103.666115	35 th St	Gravel

B.3 Terrain and Geology

The Alexander Pipeline route is located within the McKenzie Upland section of the Great Plains Physiographic Province in western North Dakota. The McKenzie Upland section is characterized by: rolling to hilly plains except in badlands areas and near prominent buttes;

evidence of glaciation near the Missouri River; gentle slopes characterized by 50 to 80 percent of the area; and local relief ranges from 300 to 500 feet. Major drainages are the Missouri, Yellowstone, and Little Missouri Rivers. The present day path of the Missouri River formed when glaciers blocked the northeastward flowing drainages and diverted drainage southeastward along the margin of the glacier. The Little Missouri River flowed northward in the valleys now occupied by Red Wing Creek and Tobacco Garden Creek prior to glaciations. Subsequently, the Little Missouri River was diverted eastward from Red Wing Creek. Similarly, the Yellowstone River flowed through the Charbonneau Creek-Timber Creek Valley prior to glaciations. The process of adjustment to the lowered base level of the Missouri River has developed a band of badlands along these drainages.

The Alexander Pipeline route is located entirely within the Williston Basin, a large elliptical depression bounded by the Canadian Shield (northeast), Alberta Shelf (northwest), Black Hills (southeast), and Wisconsin Dome (southwest). The Williston Basin covers approximately 300,000 square miles. The Williston Basin is a structurally simple basin, deepest at its center (16,000 feet below the surface near Williston, North Dakota), becoming shallower and thinning towards its edges.

The Alexander Pipeline route is entirely within the glacial deposits of the Coleharbor Group. The Coleharbor group is Pleistocene in age and includes an unbedded, unsorted mixture of clay, silt, sand, pebbles (till), plus a few cobbles and boulders. Terrain exists mainly as gently undulating to undulating topography and consists of a variety of landforms. The Bedrock is exposed along the major drainages and their tributaries in McKenzie County as far south as the limit of glaciations.¹ South of this limit, bedrock forms the surface material.

Surface elevations along the route range from approximately 2,009 feet to 2,285 feet.

B.3 (a) Geologic Hazards

Potential geologic hazards along the Alexander Pipeline route include seismic hazards, landslides, subsidence, and flooding. Since the Alexander Pipeline route is located in relatively flat and stable terrain, as opposed to active mountain belts or coastal areas, the potential for geologic hazards is reduced.

Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. A fault is a fracture along which the blocks of crust on either side have moved relative to one another parallel to the fracture. Rapid slippage of blocks of crust past each other can cause energy to be released, resulting in an earthquake. No active faults have been identified in the Alexander Pipeline study area, according to the U.S.G.S. Geologic Hazards Science Center.² An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years.

¹ Erling A. Brostuen, *Physical Data For Land-use Planning - Divide, McKenzie, and Williams Counties, North Dakota*, North Dakota Geological Survey Report of Investigation 62 (1977).

² U.S. Geological Survey, U.S.G.S. Geologic Hazards Science Center, Quaternary Fault and Fold Database of the United States, available at <http://earthquake.usgs.gov/hazards/qfaults> (accessed Mar. 2, 2015).

North Dakota historically contains little earthquake activity and is therefore not in an area of seismicity. No earthquakes of intensity V or above (Modified Mercalli Scale) have occurred within North Dakota during historical times. Furthermore, using the U.S Geological survey 2009 PSHA Model for predicting probabilities of earthquake occurrence and magnitude, there is less than a 2-4% chance of an earthquake occurring within the Alexander Pipeline study area within the next 50 years.

The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Alexander Pipeline study area is low. The hazard map uses estimated peak ground acceleration expressed as a percentage of the acceleration due to Earth's gravity. According to the ground motion hazard map there is a 2-4% probability of exceedance in 50 years; furthermore, the map predicts the most likely exceedance to be minor.³

Landslides

Landslides can be defined as gravity-caused mass movements of earth material. Included in this definition are rock falls, slumps, rock slides, mud slides, and debris flows. Landslide risks are highest in areas with steep slopes, and typically occur on steep terrain during conditions of partial or total soil saturation. In areas with landslide risk, anything impacting slope condition, such as seismic activity, construction, and increased soil moisture all aid in increasing mass movements. Landslide susceptibility is defined as the probable degree of response of the areal rocks and soils to natural or artificial cutting or loading of slopes, or to anomalously high precipitation. The entire Alexander Pipeline study area is located in areas that have moderate landslide susceptibility, yet historically low incidence.

Subsidence

Subsidence, a gradual settling or sudden sinking of earth's surface, is not a major concern along the Alexander Pipeline route. Subsidence is commonly caused by underground mining, drainage of organic soils, thawing permafrost, natural compactions, and depletion of aquifer systems. In the Alexander Pipeline study area, the only potential for concern is underground mining. Because all of the mines (open and closed) are at least 7 miles from the Alexander Pipeline route, the concern for subsidence is minimal.⁴

Flooding

In North Dakota, most flooding occurs in the spring, when the winter snow cover melts. The potential for a flood to negatively impact the Alexander Pipeline is minimal due to the lack of major stream crossing. The Alexander Pipeline as constructed is waterproof and thus the only hazard that exists is scouring.

For a flood event to affect the pipeline, 4 to 6 feet of the surface must be displaced. During construction of the Alexander Pipeline, all standing water was bored for pipe installation resulting in depths below streams and intermittent streams significantly below the 6 foot

³ U.S. Geological Survey (USGS), Geologic Hazards Science Center, *available at* geohazards.usgs.gov/hazards/apps/cmmaps/ (accessed Mar. 9, 2015).

⁴ U.S. Geological Survey, Mineral Resource Data System (MRDS), Mineral Resource Data for North Dakota, *available at* <http://tin.er.usgs.gov/mrds/>.

minimum depth required by Commission criteria. All streams crossed by the Alexander Pipeline are minor in size. Even flood events are not expected to present a scour risk in streams of this size. In addition, the periodic visual inspection of pipeline routes required under US DOT Part 195 will include a regular assessment for impacts due to flooding.

Following construction of the Alexander Pipeline, control of surface soil erosion was proactively managed while awaiting re-vegetation. Repair to soil cover will continue to occur until re-vegetation is complete.

B.4 Soils

Detailed soil characteristics along the Alexander Pipeline route were identified and assessed using the Soil Survey Geographic database (“SSURGO”; U.S. Department of Agriculture (“USDA”), Natural Resources Conservation Service (“NRCS”), 2003). The SSURGO database is a digital version of the original county soil surveys developed by the NRCS for use with geographic information systems (“GIS”). It provides the most detailed level of soil information for natural resource planning and management. The mapping scale in the Alexander Pipeline study area is 1:20,000, with a minimum delineation size of 4.0 acres. SSURGO is linked to an attribute database that gives the proportionate extent of the component soils and their properties for each map unit (USDA, NRCS 1995). The SSURGO database was used to define soil characteristics along the pipeline route in McKenzie County. SSURGO attribute data consists of physical properties, chemical properties, and interpretive groupings. Attribute data apply to the whole soil (e.g., listed hydric, prime farmland soils, slope class) as well as to layer data for soil horizons (e.g., texture, permeability). The soil attribute data can be used in conjunction with spatial data to describe the soils in a particular area.

The Alexander Pipeline study area is in the Rolling Soft Shale Plain (Major Land Resource Area 54) of the Northern Great Plains Spring Wheat Region and lies within the Missouri Plateau Section of the Great Plains Physiographic Province.

The soils in the Alexander Pipeline study area range from having course to fine loamy sands to silty clay loam.

Wind erosion may be a hazard on a few soil types in the Alexander Pipeline area. Wind erosion is severe on coarse textured and moderately coarse textured soil. These are primarily the Beisigl, Flasher, and Telfer soils. They are susceptible to wind erosion in the spring if they have been bare throughout the winter. Because of freezing and thawing, soil structure can break down, resulting in aggregates that are susceptible to movement. This can also cause fine textured soils such as Rhoades, Daglum, Arnegard, Noonan, Niobell, Williams, Bowbells, Cabba, Tally, and Maschetah soils to have a severe wind erosion hazard. Nearly all soils can be damaged by wind erosion if they are not protected by residue.

Water erosion is a hazard on gently rolling and steeper soils such as Zahl, Cabba, and Maschetah. The hazard is greatest when the surface is bare, therefore, the precautions outlined in the Environmental Mitigation Plan (“EMP”) found in Tab 5 were implemented to minimize impacts.

Tables 3.B.2 and 3.B.3 list the soil associations and the approximate acreage of each soil association, and provide a summary of soil limitations for the Alexander Pipeline route. STATSGO MUIDs are geologically and geographically related soils which correspond to soil

associations. Approximately .01 percent of the soils crossed by the pipeline route are NRCS-classified prime farmland, provided there is sufficient artificial drainage to remove excess surface water and sufficient irrigation.

TABLE 3.B.2 – Alexander Pipeline Study Area Soil Characteristics

County	Total Acres	Prime Farmland	Hydric Soils	Highly Erodible	
				Water	Wind
Acres ^a (%)					
McKenzie	40.7	.1 (.01%)	.6 (1.5%)	3.7 (9%)	1.8 (4.4%)

^aAcres is based on a 75-foot wide construction right-of-way and does not include access roads, temporary extra workspace, or areas of open water, and does not account for reduced right-of-way widths in wetlands and forested areas. Prime Farmland includes areas that are prime if drained or irrigated

TABLE 3.B.3 – Alexander Pipeline Study Area Topsoil Depths and Slope Classes

County	Total Acres	Topsoil Depth (Inches) *Depth to restrictive feature				Slope Class (%)				
		0-6	>6-12	>12-18	>18	0-6	>6-9	>9-15	>15-30	>30
Acres ^a (%)										
McKenzie	40.7	5.5 (12.4%)	0 (0)	0 (0)	35.5 (87.6%)	21.6 (53%)	7.8 (19%)	7.7 (19%)	1.8 (4.5%)	1.8 (4.5%)

^aAcres is based on a 75-foot wide construction right-of-way and does not include access roads, temporary extra workspace, or areas of open water, and does not account for reduced right-of-way widths in wetlands and forested areas.

Potential temporary effects on soil resources include the loss of soil productivity due to erosion, soil mixing, or soil compaction. Soil disturbances associated with clearing, grading and trenching expose soils to water and wind and increase the potential for erosion. Analysis of STATSGO data indicates that soils in the study area are susceptible to erosion by wind. Soil erosion by water is also common along the Alexander Pipeline route. During construction, the effects of erosion by water on steep slopes was mitigated by use of silt fences and other erosion control measures as described in Hiland’s EMP (see Tab 5).

Soil productivity could have potentially been affected if topsoil mixed with subsoil during construction. To minimize this potential, topsoil was segregated during trench excavation. Topsoil was removed to a maximum depth of 12 inches from the trench and spoil storage area unless otherwise requested by the landowner. Topsoil was stored separately from the trench spoil and was returned to its approximate original location after the trench was backfilled.

Construction caused temporary removal of vegetation and resulted in temporary exposure of soil. These actions may have resulted in some minor temporary erosion. Re-vegetation of disturbed areas, with native species, mitigates these concerns.

Heavy equipment used to construct the Alexander Pipeline may have caused soil compaction along the right-of-way. Soils were tilled with a chisel plow or other deep-tillage equipment to loosen the soil to the reasonable satisfaction of the landowner. Because the soils of the study area generally have a high shrink-swell potential, compaction will correct itself over time as the soil goes through wet-dry and freeze-thaw cycles.

B.5 Vegetation and Wildlife

Investigations were conducted on potential impacts of the Alexander Pipeline on wildlife and plant species. Information was gathered from a variety of sources to compile the existing conditions of plant, wildlife, and critical habitats within the proposed corridor. Sources included field surveys, literature reviews, and personal communications with agencies. The North Dakota Game and Fish Department (“NDGFD”), the United States Fish and Wildlife Service (“USFWS”), Lake Ilo National Wildlife Refuge, the North Dakota Parks and Recreation Department (“NDPRD”), and the US Army Corps of Engineers (“USACE”) were all contacted to assist in identifying species and ecologically significant habitats within the Alexander Pipeline corridor and along the Alexander Pipeline route. Possible areas of concern discussed with these agencies included federally-listed endangered, threatened, candidate, sensitive or watch species, state-listed protected species, and critical habitats.

The USACE was sent an overview of the Alexander Pipeline. USACE regulatory offices administer Section 10 of the Rivers and Harbors Act (Section 10) and Section 404 of the Clean Water Act (Section 404) authorizations. They requested applicable permits relating to Nationwide Permit 12, Section 10, or Section 404 may be applied for and obtained from the USACE regulatory office for future construction. No navigable river crossings were proposed, nor was any fill material placed in jurisdictional waters. All other river crossings and wetlands were horizontally directionally drilled, therefore not requiring USACE coordination or approval. The USACE reply is included in Appendix 4.E in Tab 4.

The NDGFD concurred the Alexander Pipeline will not have any significant adverse effects on wildlife or wildlife habitat based on the information provided. The NDGFD reply is included in Appendix 4.E in Tab 4.

The USFWS was sent an overview of the Alexander Pipeline. The USFWS reply is included in Appendix 4.E in Tab 4.

The Lake Ilo National Wildlife Refuge was sent an overview of the Alexander Pipeline and no comments have been received to date.

The North Dakota Natural Heritage Inventory System maintained by the NDPRD was reviewed for Species of Concern that were identified by prior field studies within the one-mile-wide environmental study corridor. A map and shapefiles were provided to the NDPRD for the analysis of each location of concern. The NDPRD reply is included in Appendix 4.E in Tab 4.

No sensitive, threatened, or endangered plant species were identified within the construction ROW. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

Field surveys were conducted on foot and via utility terrain vehicle. Field data was collected with Trimble GeoXH 6000 Series Global Positioning System handheld unit.

Analysis within the corridor included a complete inspection for species of concern, habitat components required to support species of concern, noxious weeds, and waters/wetlands. The survey area was expanded to encompass nearby areas that may have been impacted by the Alexander Pipeline. Species of concern, noxious weeds, plant species, and wildlife species were identified in the field and mapped. Any unknown species were photographed and later identified using available up-to-date literature. Personal communications and knowledge of species and species habitat were used to make a determination regarding the potential effects of the Alexander Pipeline.

B.5 (a) Vegetation

Botany surveys were performed along the approximately 4.5-mile long Alexander Pipeline route in McKenzie County during June of 2014. The Alexander Pipeline route crosses terrain mainly consisting of prairies, pasture land, and cropland. Grass species that were common in the Alexander Pipeline survey area include blue grama (*Bouteloua gracilis*), crested wheatgrass (*Agropyron cristatum*), green foxtail (*Setaria viridis*), Japanese brome (*Bromus japonicas*), junegrass (*Koeleria macrantha*), needle-and-thread (*Hesperostipa comate*), porcupine grass (*Hesperostipia spartea*), and smooth brome (*Bromus inermis*). Common forbs within the Alexander Pipeline survey area include alfalfa (*Medicago sativa*), field bindweed (*Convolvulus arvensis*), and prairie fleabane (*Erigeron strigosus*).

No federally threatened or endangered species were identified within the construction ROW or survey corridor. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7. The primary impact was the removal of vegetation in the ROW during construction activity.

In areas that required re-vegetation, Hiland specified appropriate seed mixes, application rates, and seeding dates, taking into account the requirements and recommendations of appropriate state and federal agencies as well as preferences of landowners.

Species that are considered noxious weeds under North Dakota state law are listed in Table 3.B.4. There were no noxious and invasive species that were recorded during field study that are a concern on farm and pasture lands.

TABLE 3.B.4 – Noxious Weeds Listed Under North Dakota State Law

Common Name	Scientific Name	State Status	McKenzie County Status	Impact
Baby's Breath	<i>Gypsophila paniculata</i>	Invasive	Noxious	Displaces native vegetation. Reduces protein content of desirable grasses.
Halogeton	<i>Halogeton glomeratus</i>	Invasive	Noxious	Extremely difficult to control. The extensive root system and twine-like growth disrupts harvesting operations and replaces desirable vegetation.
Burdock: Common	<i>Arctium minus</i>	Invasive	Noxious	Displaces important plant communities. Taint milk products if heavily grazed.
Henbane: Black	<i>Hyoscyamus niger</i>	Invasive	Noxious	Toxic to humans and animals. Replaces desirable native species.
Houndstongue	<i>Cynoglossum officinale</i>	Invasive	Noxious	Displaces desirable plant communities, decreases grazing.
Common tansy	<i>Tanacetum vulgare</i>	Invasive		Aggressive plant that can form dense vegetative colonies, thus reducing rangeland productivity.
Knapweed: Diffuse	<i>Centaurea diffusa</i>	Noxious		May seriously reduce productive potential of infested rangelands.
Knapweed: Russian	<i>Acroptilon repens</i>	Noxious		Most distributed knapweed and most difficult to control. Inhibits growth in crop plants and other desirable plant species.
Knapweed: Spotted	<i>Centaurea maculosa</i>	Noxious		Reduces livestock and wildlife forage and increases surface water runoff, soil erosion, and stream sedimentation.
Loosestrife: Purple	<i>Lythrum salicaria</i>	Noxious		Quickly displaces native wetland vegetation and has the potential to cause a severe impact on wildlife. Roots of the plant can cause obstruction of water flow in ditches in canals.
Saltcedar	<i>Tamarix chinensis</i> <i>T. parviflora</i> <i>T. ramosissima</i>	Noxious		Displaces native vegetation by releasing salts to inhibit the growth of vegetation.
Spurge: Leafy	<i>Euphorbia esula</i>	Noxious		Contains milky latex which causes oral and digestive irritation in cattle. The plant also replaces desirable forage.
Thistle: Canada	<i>Cirsium arvense</i>	Noxious		Displaces desirable plant species and is unpalatable to livestock. Infestations decrease land value for crop production and grazing.
Thistle: Musk	<i>Carduus nutans</i>	Noxious		Corrupts pastures and reduces grazing in the vicinity.
Toadflax: Dalmatian	<i>Linaria genistifolia</i>	Noxious		Unpalatable to livestock and will flourish over native species.
Toadflax: Yellow	<i>Linaria vulgaris</i>	Noxious		Displaces existing plant communities and associated wildlife. Corrupts pasture lands and reduces grazing.

Common Name	Scientific Name	State Status	McKenzie County Status	Impact
Wormwood: Absinth	<i>Artemisia absinthium</i>	Noxious		Reported to contaminate the milk produced by cattle. Species inhibits growth of desirable forage.

B.5 (b) Wildlife

Wildlife surveys were performed along the 4.5-mile Alexander Pipeline route in McKenzie County during June of 2014. Keitu environmental field surveyors conducted a thorough inspection of private land consisting of prairies, cropland, rangeland, and wetland environment.

Common wildlife identified in the survey area included brown-headed cowbird (*Monothrus ater*), coyote (*Canis latrans*), mallard (*Anas platyrhynchos*), northern pintail (*Anas acuta*), pronghorn antelope (*Antilocapra americana*), ring-necked pheasant (*Phasianus colchicus*), sharp-tailed grouse (*Tympanuchus phasianellus*), and western meadowlark (*Sturnella neglecta*).

The following state-listed Species of Conservation Priority, U.S. Forest Service (“USFS”) Sensitive, and Bureau of Land Management (“BLM”) Sensitive species were identified during the biological field survey conducted in the survey area in June of 2014: bobolink (*Dolichonyx oryzivorus*), lark bunting (*Calamospiza melanocorys*), northern harrier (*Circus cyaneus*), northern pintail (*Anas acuta*), and sharp-tailed grouse (*Tympanuchus phasianellus*). There were no state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive species identified within the construction ROW. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

The Alexander Pipeline has had no significant effects on the State Sensitive Species for North Dakota. Based on the size of the Alexander Pipeline and route locations, the Alexander Pipeline’s effect on habitat is not anticipated to alter a species population.

B.5 (c) Raptors

A ground raptor survey was conducted in June of 2014 to locate any raptors as well as suitable nests. Two surveyors thoroughly examined the area within the 1-mile-wide survey corridor along the ROW to locate currently active or inactive raptor nests. Nesting habitat along the survey corridor included shelterbelts and grasslands. No nests large enough to support raptors were recorded during the survey.

The North Dakota raptor species of concern detailed by the North Dakota Natural Heritage Inventory System with potential to be located in McKenzie County include the following: golden eagle (*Aquila chrysaetos*), Swainson’s hawk (*Buteo swainsoni*), merlin (*Falco columbarius*), prairie falcon (*Falco mexicanus*), and the burrowing owl (*Athene cunicularia*).

The following state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive species was identified in the study corridor during the aerial raptor survey conducted in June of 2014: Northern harrier (*Circus cyaneus*).

Even though a raptor of concern was spotted during the survey, due to the range of these raptors it is not uncommon for one to be seen at a distance greater than one mile from their

nests, making it quite probable that the raptor species of concern seen during the survey was in fact nesting outside the corridor. Findings are reported on the appropriate plate in Appendix 4.B in Tab 4, as well as electronically presented as ESRI ArcGIS software compatible data files in Tab 7.

B.6 Cultural Resource Studies

Beaver Creek Archaeology, Inc. (“Beaver Creek”) of Bismarck, North Dakota was engaged to review existing site file data maintained by the North Dakota State Historic Preservation Office (“SHPO”) to determine if any portion of the Alexander Pipeline route was previously surveyed for cultural resources. The file search was performed in May of 2014 using a 1-mile-wide study corridor for the entire route.

A Class III Cultural Resource Inventory was conducted on the Alexander Pipeline survey area on July 8, 2014. A report was issued in July of 2014. The majority of the cultural field study corridor was 250 feet wide, for a total area of 131 acres inventoried; however, only 81 acres will be under review as a part of this Application. The Class III Cultural Resources Inventory report prepared by Beaver Creek is included in this application under Tab 4, Appendix 4.A.

The file search revealed 15 sites, no site leads, and no isolated finds in a one-mile radius of the survey area. During the course of the inventory, no cultural resources were found. Beaver Creek recommended that the Alexander Pipeline proceed under a *No Historic Properties Affected* as surveyed, mapped, and described herein.

The cultural resource location details are not publicly available per request of the North Dakota State Historic Society, but Beaver Creek has provided a redacted version of the report to be available for this application.

The SHPO has been provided with a complete version of the Class III Cultural Resource Inventory report issued by Beaver Creek. A letter of concurrence with a finding of “No Significant Sites” was received from SHPO dated July 31, 2014.

B.7 Land Use

Specific to the Alexander Pipeline study area, agricultural production is the predominant land use. Approximately 84% is cropland or pasture, 15% is native rangeland, and 1% is forest, shrub, or wetland. The Alexander Pipeline is not located within any city limits or urban areas.

The primary crops cultivated in the area include wheat, grain, and alfalfa. The Alexander Pipeline only resulted in temporary impacts to agricultural land use. Landowners were compensated for crop loss or reduced yields caused by construction of the Alexander Pipeline. No permanent crop loss occurred. Deep tillage was implemented as necessary to mitigate effects of soil compaction.

The Alexander Pipeline route runs in the vicinity of, and sometimes adjacent to, existing oil well sites. Although developers will have to abide by state and/or local ordinances and easement restrictions, future residential developments will not be precluded by the Alexander Pipeline. After installation of the pipeline, disturbed areas were restored to pre-construction conditions to the extent reasonably practicable, and generally reverted to pre-construction uses. No long-term change in land use is anticipated.

B.8 Water Resources

B.8 (a) Water Resources-Ground Water

The project lies in the Missouri River Basin, which is one of the five major hydrologic subdivisions in North Dakota. The Missouri River Basin is the largest in the state and drains approximately 48% of the state's total area. With respect to the ground water used in the basin, 69% is used for irrigation, 14% is used for livestock, 7% is used for industrial, 6% is used for municipal, 3% is used for rural domestic, and 1% is used for rural water systems/other.⁵

Groundwater in North Dakota occurs within bedrock or unconsolidated deposits. Bedrock aquifers underlie the glacial drift aquifers (aquifers in unconsolidated deposits). There are 10 Aquifer systems within the Alexander Pipeline study area that contain suitable water. Water from rocks of Pre-Cretaceous Age and the Dakota Group of the Cretaceous System would not be suitable for most purposes.

The aquifers of Tertiary Age include the Tongue River Aquifer System (bedrock aquifers). This aquifer underlies all of McKenzie County at a depth between 140 to 500 feet in most areas, and is used for domestic and livestock purposes. The median dissolved solids concentration is about 1830 milligrams per liter. The estimated yield from this aquifer is 25 gallons per minute and the water type is Sodium Bicarbonate.

The glacial drift aquifers within the Alexander Pipeline study area of the Quaternary age include the Charbonneau and Tobacco Garden Aquifer Systems.

The Charbonneau and Tobacco Garden Aquifers in McKenzie County are suitable for domestic and livestock supplies, with some parts of the aquifers suitable for municipal and industrial supplies and irrigation use. The median dissolved solids concentration ranges from about 947 to 1,100 milligrams per liter. Estimated yield from these aquifers ranges from 100 gallons per minute in the Charbonneau Aquifer to 500 gallons per minute in the Tobacco Garden Aquifer. The water types in these aquifers are Sodium bicarbonate.

The groundwater information reviewed for the Alexander Pipeline came from County Ground Water Studies.⁶ The following tables summarize the Aquifer information.

⁵ North Dakota State Water Commission, *A Reference Guide to North Dakota Waters* (2014), available at <http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryPDF/136/WaterRefGuide.pdf>.

⁶ M.G. Croft, *Ground Water Resources of McKenzie County, North Dakota*, North Dakota Geological Survey Bulletin 90, part III, and North Dakota State Water Commission County Ground-Water Studies 37, part III, p. 57 (1985).

TABLE 3.B.5 – Alexander Pipeline Study Area Aquifer Information

Aquifer Name	Area (sq mi)	Depth (ft)	Re-Charge (In/Yr)	Estimated yield (gpm)	Topography (%Slope)	Water Type	Conductivity (gpd/ft2)	Median dissolved solids (ppm)	Permitted Water Use (Ac Ft/Yr)
Charbonneau	24	33	1.4	100	11	NaHCO ₃	288	1100	315.0
Tobacco Garden	23	44	1.5	500	15	NaHCO ₃	3740	947	1056.5
Tongue River		140 - 800		25 – 50		NaHCO ₃		1830	

* North Dakota Department of Health —Ground Water-Aquifer Monitoring—Table B-7 North Dakota Geographic Targeting System Scoring All Aquifer Data Listed by Aquifer Name 09/05/96, available at <http://www.ndhealth.gov/wq/gw/pubs/gwt.htm>; County Ground Water Studies, available at <http://www.swc.nd.gov/4dlink9/4dcgi/GetSubCategoryRecord/Reports%20and%20Publications/County%20Ground%20Water%20Studies>.

TABLE 3.B.6 – Alexander Pipeline Study Area Well Information

Aquifer	Number of wells by type in Alexander Pipeline study area						
	Domestic	Stock	Municipal	Industrial	Irrig.	Prod.	Unknown
Glacial Drift Aquifers:							
Charbonneau	6	2	0	2	12	0	0
Little Muddy	0	0	0	0	0	0	0
Yellowstone Buried Chanel	14	0	0	0	5	0	16
Tobacco Garden Creek	16	5	5	3	4	0	2
Yellowstone-Missouri	0	0	0	3	1	0	0
Bedrock Aquifers:							
Fox Hills	37	60	0	5	0	4	15
Hell Creek	0	3	0	0	0	0	0
Tongue River	5	10	0	3	0	0	6
Sentinel Butte-Tongue River	49	43	0	9	0	0	9
Dakota Group	0	0	0	0	0	0	1
Fort Union	23	10	0	1	0	1	12

* North Dakota State Water Commission, Ground and Surface Water Date Query, available at <http://www.swc.state.nd.us/4dlink2/4dcgi/wellsearchform/Map%20and%20Data%20Resoursrce>.

No sub-surface injection of water is expected for the Alexander Pipeline. Any released water was discharged to surface water, subject to the requirements of the general National Pollutant Discharge and Elimination System (“NPDES”) permit issued by the ND Department of Health.

The Alexander Pipeline is not expected to impact North Dakota ground water quality.

B.8 (b) Surface Waters

Topographic maps and current aerial photos were reviewed to identify streams, rivers, and lakes crossed by the Alexander Pipeline route (See Table 3.B.7). Waterbodies were crossed via HDD or bored in accordance with applicable regulatory requirements. No creeks were permanently drained or filled as part of the Alexander Pipeline, and effects on creeks were

short-term and minor. Hiland restored the construction ROW as close to pre-construction contours as practicable.

TABLE 3.B.7 – Alexander Pipeline Wetland and Waterbody Crossings

Name	Location	Resource Type	Construction Method	Impacted Acreage
McKenzie County				
Camp Creek	S6 T151N R101W SWSW	Waterbody	HDD	0.0
Un-named drainage to Camp Creek	S25 T152N R102W SESE	Waterbody	HDD	0.0
Un-named drainage to Low Area Wetland	S24 T152N R102W SESE	Waterbody	HDD	0.0

B.8 (c) Wetlands

Hiland, through its consultants, conducted a desktop evaluation using aerial-based photography and USGS topographic maps identifying potential waters of concern within North Dakota to identify wetlands along the Alexander Pipeline route. No wetlands were identified during the desktop evaluation. No wetland impacts occurred during construction of the Alexander Pipeline.

B.8 (d) Water Use

The Alexander Pipeline did not have a significant effect on water use patterns. Following construction, drains, swales, and flowages were restored to pre-construction contours to the extent practicable to minimize disruption of water resources.

The Alexander Pipeline required temporary appropriations of water for use in the hydrostatic testing of the newly installed pipeline. The majority of the water used for hydrostatic testing was purchased from freshwater wells and transported to testing sites. The Alexander Pipeline did not result in a significant effect on existing or future water uses in the region.

B.8 (e) Water Runoff from Surfaces

Much of the Alexander Pipeline study area is level or only gently sloping, which limits the potential for runoff effects.

During construction of the existing Alexander Pipeline, Hiland complied with the North Dakota Department of Health NPDES general permit for Storm Water Discharges associated with Construction Activity and the associated Storm Water Pollution Prevention Plan (“SWPPP”) to prevent and minimize construction-related effects of the Alexander Pipeline on surface waters.

Hiland obtained authorization under a general permit for Storm Water Discharges Associated with Construction Activity from the North Dakota Department of Health, which implements a

federal program under the Clean Water Act. Hiland implemented the requirements from the NPDES and SWPPP into the EMP describing best management practices for construction and post-construction. Hiland, its general contractor, and Alexander Pipeline subcontractors implemented measures to minimize off-site erosion from site storm water runoff. These practices protected surface water and soil resources within the Alexander Pipeline ROW. Hiland's EMP was included in the construction specifications for the Alexander Pipeline and enforced by one or more environmentally trained construction inspectors during construction. Because the ROW was restored to pre-construction conditions following Alexander Pipeline construction, area runoff following construction generally reflects surrounding land use.

B.8 (f) Discharges to Surface Waters

During construction of the Alexander Pipeline, point source wastewater discharge was generated from hydrostatically testing the new pipeline prior to placing it in service. Discharges also occurred as needed for trench dewatering during construction. The North Dakota Department of Public Health has developed a General Permit (Permit No. NDG-070000) which authorizes the discharge of waters related to temporary dewatering and hydrostatic testing.

Testing and discharge was consistent with the General Permit (Permit No. NDG-070000). Discharges of hydrostatic test water typically are controlled discharges directly to the ground surface or occasionally into Waters of the State. Typically, water was purchased from freshwater wells. The NDPDES permit specifies that discharge water must be free from process and other wastewater discharge.

B.8 (g) Protection from Fuel Spills

Motorized construction equipment utilized for construction was powered by gasoline- or diesel-fueled engines. Fuel for construction vehicles was used and stored consistent with regulations of the US Environmental Protection Agency set forth in 49 C.F.R. § 195.112 for areas with at least 1,320 gallons of aggregate storage capacity and/or consistent with the National Fire Protection Association Code 395 for storage and handling of petroleum-based fuels in isolated and/or remote areas.

If more than 1,320 gallons of oil storage occurs at one area, the contractor is required to prepare and implement a spill prevention, control, and countermeasure ("SPCC") plan in accordance with 49 C.F.R. § 195.112, including having the plan reviewed and certified as adequate by a registered professional engineer. The SPCC plan outlines required secondary containment measures to be installed around bulk storage containers (i.e., tanks and drums) as well as other oil-handling areas such as unloading and dispensing areas. The SPCC plan also describes response, containment, and cleanup measures. Training requirements of impacted employees were outlined. Hiland utilized the SPCC plan when necessary.

Contractors were required to provide trained personnel, appropriate equipment, and materials to contain and clean up spills of fuel, lubricating oil, or hydraulic fluid that result from equipment failure when working in or near wetlands or surface water bodies. Storage of bulk fuels was prohibited within 100 feet of an open waterway or surface water during construction.

SECTION C SITING CRITERIA

C.1 Relative Value and Effects upon Each Criterion Including Location, Construction, and Operation of the Facility (N.D.A.C. § 69-06-05-01(2)(k))

In accordance with Section 49-22-09 of the North Dakota Century Code and Section 69-06-08-02 of the North Dakota Administrative Code, the Alexander Pipeline route was developed after consideration of its impact on humans and the environment. Alternative routes or options, which are discussed in Section C.2 of the Application for Certificate of Corridor Compatibility, are not optimum and may result in more significant impacts.

Underground pipeline installation minimizes potential impacts on human and animal welfare and aesthetics. Construction of the Alexander Pipeline resulted in temporary disruption to the environment, but did not result in long-term negative impacts to the environment. A general analysis of the existing human and natural environment along the Alexander Pipeline route and the impacts or potential impacts of ROW preparation, construction practices, and operation and maintenance procedures are included in Section B. The additional factors and criteria to be considered are discussed below.

C.2 Factors to be Considered in Evaluating Applications and Designation of Sites, Corridors, and Routes (N.D.C.C. § 49-22-09)

C.2 (a) Available Research and Investigations Relating to the Effects of the Location, Construction, and Operation of the Proposed Facility on Public Health and Welfare, Natural Resources, and the Environment

Record and database research relating to the effects of the location, construction, and operation of the Alexander Pipeline included (1) conducting a Class I Cultural Resource Inventory, (2) reviewing the Water Well Inventory maintained by the North Dakota State Water Commission, (3) utilizing the United States Fish and Wildlife Service's Wetlands Mapper, and (4) utilizing the North Dakota Game and Fish Department's Wildlife Action Plan. In addition, site-specific information, such as the presence of occupied buildings, protected species and/or environmentally sensitive areas, was obtained during field studies conducted in June of 2014. A Class III Cultural Resource Inventory was conducted in July of 2014.

C.2 (b) The Effects of New Energy Conversion and Transmission Technologies and Systems Designed to Minimize Adverse Environmental Effects

The Alexander Pipeline design is consistent with existing pipeline technologies and does not include new energy conversion or transmission technologies.

C.2 (c) The Potential for Beneficial Uses of Waste Energy from a Proposed Energy Conversion Facility

The Alexander Pipeline does not involve construction of an energy conversion facility.

C.2 (d) Adverse Direct and Indirect Environmental Effects which cannot be Avoided Should the Proposed Site or Route be Designated

Unavoidable adverse direct and indirect environmental effects included temporary construction-related effects on vegetation, wildlife, agricultural operations, transportation, and noise levels, as described in Section B.4 below. However, since construction was completed (1) outside of the prime growing season when feasible and (2) on an accelerated timeline, impacts to agricultural operations were minimal and impacts to transportation were short-term. Impacts on vegetation and wildlife were also minimal. Vegetation was removed from the ROW prior to Alexander Pipeline construction, and the area was returned to pre-construction contours and re-seeded following construction. Wildlife may have temporarily avoided the ROW during construction, but no long-term impacts are anticipated. Noise level increases were associated only with construction. In addition, Hiland implemented thorough mitigation measures to minimize construction-related impacts as described in its EMP presented as Tab 5 and Tab 6 in this consolidated application.

C.2 (e) Alternatives to the Proposed Site, Corridor, or Route which are Developed During the Hearing Process and which Minimize Adverse Effects

Desktop studies for portions of the pipeline corridor and route, including a Class I archaeology study and environmental database retrieval, were conducted by a North Dakota-based environmental consulting firm prior to initial pipeline construction. The corridor was selected to avoid or minimize environmental and socioeconomic impacts along the route. The route was modified prior to initial construction to avoid or minimize environmental, cultural resource, and socioeconomic impacts.

The addition of pump stations, control features, and relief tankage occurred adjacent to previously disturbed areas and in locations where no protected plant habitats, animal habitats, or culturally relevant features exist.

In addition, the Alexander Pipeline route was selected based on voluntary landowner participation and landowner input regarding the specific location of the Alexander Pipeline. The route is described in Section A and depicted in diagrams presented in Tab 4.

C.2 (f) Irreversible and Irretrievable Commitments of Natural Resources Should the Proposed Site, Corridor, or Route be Designated

The Alexander Pipeline required minimal irreversible or irretrievable commitments of natural resources. Oil field gathering systems and natural gas pipelines are located in the vicinity of the Alexander Pipeline. Steel was utilized for the pipeline, and petroleum fuel was required for construction equipment.

C.2 (g) The Direct and Indirect Economic Impacts of the Proposed Facility

Upon conversion, the Alexander Pipeline will present an optimization of new and existing pipeline capacity to meet the need for additional liquid petroleum transportation to this region. Hiland's shippers support the proposal to be an appropriate economical response to the need for additional mid-stream pipeline transport capacity.

Application of horizontal drilling technology and high crude oil prices resulted in a resurgence of oil drilling activity in North Dakota. Unprecedented success has occurred in the Bakken oil formation, resulting in more than doubling of oil production in North Dakota in the last three years. A summary of annual crude oil production in the state is presented in Table 3.C.1, below.

Year	Total Crude Oil Production, Barrels	% Gain over 2010
2010	113.1 million	---
2011	153.0 million	35.3 %
2012	242.5 million	114.4 %
2013	313.2 million	176.9 %

Crude oil produced in North Dakota is generally shipped by pipeline to one of three market hubs: (1) Tesoro's Mandan, North Dakota refinery; (2) the Guernsey, Wyoming interconnection hub; and/or (3) the Clearbrook, Minnesota interconnection hub. Crude oil can also be transported by truck to Canada, and by rail directly to refineries or to East, West, and Gulf Coast markets.

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

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

The purpose of the Alexander Pipeline is to provide "mid-stream" transportation alternatives for the expanding volumes of crude oil produced in North Dakota. Conversion of the Alexander Pipeline will help bring North Dakota sweet crude to more markets in the United States, therefore allowing for a more competitive price.

Upon conversion from a gathering line to a transmission line, the Alexander Pipeline will transport crude oil from McKenzie County to major crude markets via Hiland's Market Center System using a connection near Alexander, North Dakota. The Alexander Pipeline's proximity to other crude gathering systems in northwestern North Dakota will provide a pipeline alternative to trucking.

In addition to increasing the crude oil transmission capacity within North Dakota, the Alexander Pipeline provides other benefits. For example, the Alexander Pipeline has increased, and has

⁷ U.S. Energy Information Administration, Crude Oil Production by State, North Dakota Field Production of Crude Oil, *available at* <http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=MCRFPND1&f=A> (last visited March 2, 2015).

the potential to further increase, the tax base of McKenzie County. Construction workers were hired from pipeline contractors, equipment contractors, suppliers, and regional testing firms. Forty to fifty percent of the labor force was hired from the regional labor pool. In addition, environmental consultants, safety, and construction inspectors were employed during Alexander Pipeline construction and restoration. North Dakota-based consulting firms were selected to assist with the permitting process. Wages paid to non-local contractors and/or personnel benefit the regional economy through expenditures for supplies, lodging, fuel, and other services.

Materials for the expansion were obtained from U.S. and North American suppliers. The materials and equipment needed for construction, including welding supplies, heavy equipment, electrical components, and building materials, were supplied from this region when possible.

C.2 (h) Existing Plans of the State, Local Government, and Private Entities for Other Developments at or in the Vicinity of the Proposed Site, Corridor, or Route

Over the past several years, the North Dakota Pipeline Authority has been working with producers and regional pipeline companies to address issues surrounding the safe transportation of crude oil produced in the state. "The Williston Basin: Greasing the Gears for Growth in North Dakota" was published by Bentek Energy, LLC under funding from the North Dakota Pipeline Authority, providing an update regarding the State's current and forecasted production and projected infrastructure needs. The 129-page report released July 25, 2012 highlights that oil production from the Williston Basin, which includes the Dakotas and Montana, soared more than 400% in the 5 years prior to 2012. Oil production from the Williston Basin is expected to continue to grow until 2025. Bentek Energy, LLC also speculated that planned refinery and pipeline projects will not be sufficient to keep up with the increased production. Producers will therefore continue to utilize more expensive transportation options until additional pipeline capacity is available.⁸ A report excerpt on crude oil alternatives is presented as Appendix A in Tab 2.

Paradigm Midstream Services - ND, LLC and Phillips 66 Partners plan to construct a 70-mile pipeline and other facilities to transport crude oil from Johnson's Corner in McKenzie County, North Dakota, to Stanley Station in Mountrail County, North Dakota with connections to Dakota Plains Holdings, Inc.'s Pioneer crude oil rail terminal located in New Town in south Mountrail County, North Dakota. The pipeline will also tie into Enbridge Pipeline's station located near Stanley in north Mountrail County. The interconnection will allow access to all of Enbridge North Dakota's existing pipeline, as well as the Sandpiper Pipeline currently under construction. Enbridge also operates a crude oil rail terminal at Berthold. The intrastate pipeline and its interconnections to rail terminals and other pipeline systems will provide access to multiple refinery markets throughout the United States.

Energy Transfer Partners/Phillips 66 Partners is expecting to build the 1,100 mile long Dakota Access Pipeline to move crude oil from North Dakota to Patoka, Illinois. The pipeline, with an initial capacity of 320,000 barrels per day and expandable to 575,000 barrels per day, will allow shippers to access markets in the Midwest, East Coast, or Gulf Coast in addition to a new rail terminal planned in Illinois. The 16-inch to 30-inch diameter pipeline is expected to begin operation in 2016. The pipeline will originate near Stanley in Mountrail County, loop west along the north side of Lake Sakakawea, and cross the Missouri River near Fort Buford. The pipeline

⁸ Bentek Energy, LLC, "The Williston Basin: Greasing the Gears for Growth in North Dakota," July 25, 2012, pp. 35, 47.

will then transect McKenzie County, connecting to new terminal tankage at both Watford City and Johnson's Corner until it parallels the Northern Border natural gas pipeline corridor to exit the state to the southeast.

A letter was sent to the county planning director for McKenzie County to gain information on planned developments within the vicinity of the Alexander Pipeline. McKenzie County Planning and Zoning provided a list of permits throughout the county. No developments conflicting with the Alexander Pipeline have been discovered as of the date of this application.

Due to recent and continued crude oil volume expansion in the state, the Alexander Pipeline and any proposed projects can be supported under current and foreseen economic conditions.

Hiland is not aware of any other existing plans by state, local government, or private entities with respect to any other planned development in the vicinity of the Alexander Pipeline's corridor based on a review of publicly available documents. However, based on recent history, it is likely that expansion of crude oil and natural gas pipeline systems will continue to occur. No potential conflicts with any developments have been identified.

C.2 (i) The Effect of the Proposed Site or Route on Existing Scenic Areas, Historic Sites and Structures, and Paleontological or Archaeological Sites

The Class III Cultural Resources Inventory report prepared by Beaver Creek is included in this application under Tab 4, Appendix A. See Section B.6 of this application for a further discussion on the findings of this study.

The file search revealed 15 sites, no site leads, and no isolated finds in a one-mile radius of the survey area. During the course of the inventory, no cultural resources were found. Beaver Creek recommended that the Alexander Pipeline proceed under a *No Historic Properties Affected* as surveyed, mapped, and described herein.

The cultural resource location details are not publicly available per request of the North Dakota State Historic Society, but Beaver Creek has provided a redacted version of the report to be available for this application. General locations of cultural resource sites are included in Tab 4, Appendix 4.B.

The SHPO was provided with a complete version of the Class III Cultural Resource Inventory report issued by Beaver Creek. A letter of concurrence with a finding of "No Significant Sites" was received from SHPO dated July 31, 2014.

C.2 (j) The Effect of the Proposed Route on Areas which Are Unique Because of Biological Wealth or Because They are Habitats for Rare and Endangered Species

The following animal state-listed Species of Conservation Priority, USFS Sensitive, and BLM Sensitive Species were identified during the biological field survey conducted in the one-mile-wide environmental survey area in June of 2014: bobolink (*Dolichonyx oryzivorus*), lark bunting (*Calamospiza melanocorys*), northern harrier (*Circus cyaneus*), northern pintail (*Anas acuta*), and sharp-tailed grouse (*Tympanuchus phasianellus*).

There were no state-listed animal Species of Conservation Priority, USFS Sensitive, and BLM Sensitive Species identified within the construction ROW during the field survey.

Because no populations of sensitive animal species were found within the construction ROW, Hiland’s environmental consultants have concluded that the Alexander Pipeline had no significant effect on unique areas of biological wealth or habitats for rare and endangered species.

C.2 (k) Problems Raised by Federal Agencies, Other State Agencies, and Local Entities

No problems or concerns have been raised by federal agencies, state agencies, or local entities.

C.3 Exclusion Areas (N.D.A.C. § 69-06-08-02(1))

The Commission has identified certain sensitive or otherwise important environmental features that must be considered during the selection of a corridor and a route for transmission facilities. These features have been classified as either “Exclusion Areas” or “Avoidance Areas.” As set forth in Section 69-06-08-02(1) of the North Dakota Administrative Code, Exclusion Areas are areas that are to be excluded from consideration for transmission facility routes, and may encompass only up to fifty percent of the width of transmission facility corridors unless there is no reasonable alternative.

Appendix 4.B (see Tab 4) contains maps depicting Exclusion and Avoidance Areas within the one-mile-wide study corridor centered on the Alexander Pipeline route. The Alexander Pipeline route has been superimposed on both aerial photographic maps as well as USGS Quadrangle Topographic Maps.

TABLE 3.C.2 – Exclusion Areas

Exclusion Area	Within Study Area	Crossed By Route	Description of Exclusion Area and Proposed Buffer
Designated or registered national: parks; memorial parks; historic sites and landmarks; natural landmarks; monuments; and wilderness areas	None	None	
Designated or registered state: parks; historic sites; monuments; historical markers; archeological sites; nature preserves	None	None	
County parks and recreational areas; municipal parks; and parks owned or administered by other governmental subdivisions	None	None	
Areas critical to the life stages of threatened or endangered animal or plant species	None	None	

Exclusion Area	Within Study Area	Crossed By Route	Description of Exclusion Area and Proposed Buffer
Areas where animal or plant species that are unique or rare to this state would be irreversibly damaged	Yes	None	Appendix 4.B (See Tab 4) contains maps depicting Exclusion areas within the one-mile-wide study corridor. Although several sensitive animal species were found within the study area, Hiland's environmental consultants believe these species were not irreversibly damaged.
Areas within one thousand two hundred feet of the geographic center of an intercontinental ballistic missile (ICBM) launch or launch control facility	None	None	
Areas within thirty feet on either side of a direct line between intercontinental ballistic missile (ICBM) launch or launch control facilities to avoid microwave interference.	None	None	

C.4 Avoidance Areas (N.D.A.C. § 69-06-08-02(2))

As set forth in Section 69-06-08-02(2) of the North Dakota Administrative Code, Avoidance Areas are areas that are not to be considered in the routing of a transmission facility unless it is shown that, under the circumstances, there is no reasonable alternative. Avoidance Areas may encompass only up to fifty percent of the width of a transmission facility corridor unless there is no reasonable alternative.

Two types of Avoidance Areas were identified within the Alexander Pipeline study corridor (see Table 3.B.3 below).

Significant archeological sites within the study corridor are summarized in Section B.6 and discussed in detail in the report in Appendix 4.A in Tab 4.

One rural residence was identified within 500 feet of the Alexander Pipeline. The residence is located outside of the construction ROW and does not encompass more than fifty percent of the width of the corridor in any location. Hiland is working with owners of the affected residence to obtain a waiver pursuant to North Dakota Century Code Section 49-22-05.1. Conversion of the existing pipeline from a gathering to a transmission pipeline will have no impact on operations near the residence.

Appendix 4.B (see Tab 4) contains maps depicting Avoidance Areas within the one-mile-wide study corridor centered on the Alexander Pipeline route. The Alexander Pipeline route has been superimposed on both aerial photographic maps as well as USGS Quadrangle Topographic Maps.

TABLE 3.C.3 – Avoidance Areas

Avoidance Area	Within Study Area	Crossed By Route	Description of Avoidance Area and Proposed Buffer
Designated or registered national: historic districts; wildlife areas; wild, scenic, or recreational rivers; wildlife refuges; and grasslands	None	None	
Designated or registered state: wild, scenic, or recreational rivers; game refuges; game management areas; management areas; forests; forest management lands; and grasslands	None	None	
Historical resources which are not specifically designated as exclusion or avoidance areas	Yes	None	Archeological sites within the study corridor are summarized in Section B.6 and discussed in detail in the report in Tab 4 Appendix 4.A.
Areas that are geologically unstable	None	None	
Within five hundred feet [152.4 meters] of a residence, school, or place of business	Yes	None	One residence is within 500 feet of the pipeline. A waiver will be obtained from the landowner.
Reservoirs and municipal water supplies	None	None	
Water sources for organized rural water districts	None	None	
Irrigated land	N/A	N/A	Not applicable for underground transmission facilities.
Areas of recreational significance which are not designated as exclusion areas	None	None	

C.5 Selection Criteria (N.D.A.C. § 69-06-08-02(3))

The North Dakota Administrative Code specifies several selection criteria to be considered in designating a transmission corridor or route. Specifically, the Commission considers whether adverse effects from the location, construction, and maintenance of the facility as they relate to the selection criteria will be at an acceptable minimum, and whether these effects will be managed and maintained at an acceptable minimum. Potential impacts, as they relate to each of the selection criteria, are discussed below. Measures Hiland has implemented, and will implement, to minimize these impacts are noted below and discussed in greater detail in Section D.

C.5 (a) Agricultural Production

The Alexander Pipeline was installed within a new ROW in McKenzie County in northwestern North Dakota. The pipeline crosses agricultural and pasture lands where crop and livestock

production are the primary economic activity. The primary crops cultivated in the area include barley, wheat, and alfalfa.

Construction of the Alexander Pipeline resulted in temporary effects on agricultural land use. Hiland instituted appropriate management practices to restore all areas to pre-construction contours to the greatest extent practicable.

Hiland required that construction equipment be cleaned before arriving on site to prevent the introduction of undesirable species to the surrounding Alexander Pipeline ROW. The addition of above-ground facilities occurred adjacent to previously disturbed areas. Hiland implemented the following mitigation measures during facility construction when undesirable species were found within the construction ROW:

- Hiland made an effort to prevent the spread of noxious weed seeds during clearing and grading activities, and used straw mulch and seed mix that are free of noxious weed seed to re-vegetate the ROW. Contractors and construction inspectors received information to help them identify noxious weeds. Hiland also provided training to its construction inspectors regarding identifying and preventing the spread of undesirable species.
- During pre-construction walkovers, Hiland's environmentally trained construction inspectors flagged and documented areas containing noxious weeds if found. The construction crews were informed of these areas. Hiland instructed the contractors to minimize the amount of construction equipment and limit the number of passes by this equipment through infested areas. Construction mats were used to minimize the transport of weed seed or plant material via construction equipment.
- Equipment and construction mats were cleaned immediately after passing through infested areas. Cleaning consisted of removing large soil clods and/or plant parts from the equipment and construction mats using shovels and brooms and, when necessary, washing the equipment with water or cleaning using compressed air. Soil and water from cleaning activities were not allowed to flow to non-infested areas.
- Final seeding was initiated within 24 hours of final grading, so long as there were appropriate weather and soil conditions, to prevent the establishment of noxious weed seeds that may have been present in the existing seed bed.

The Alexander Pipeline was installed at a depth that exceeds the typical tillage depth. Following construction, agricultural lands were returned to pre-existing contours to the greatest extent practicable. Therefore, the Alexander Pipeline did not interfere with normal agricultural operations on cropland after construction. Construction operations were conducted after the harvest season and prior to the growing season when feasible. Therefore, minimal disruption to agricultural production occurred.

Above-ground facilities on cropland are limited to line markers, cathodic protection rectifiers, and test stations which can be sited within fence lines. Therefore, the Alexander Pipeline resulted in minimal long-term loss of farmland use. Hiland consulted with landowners to place above-ground appurtenances in areas that cause the least amount of disturbance to landowner operations. Landowners have been compensated by either long-term lease agreements or by the purchase of the land for these sites.

Less than 1 percent (0.1 acres) of the 40.7 acres of the Alexander Pipeline route crosses prime farmlands, as classified by the Natural Resource Conservation Service (“NRCS”) (see Table 3.B.2). This total includes prime farmland and land that would be considered prime farmland if drained. Prime farmland is defined as land with the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Construction activities did not significantly affect the factors, such as soil quality, growing season, or moisture supply, that are considered in determining whether land is prime farmland.

C.5 (b) Family Farms and Ranches

The Alexander Pipeline does not alter the pattern of land ownership or create long-term disruptions of family farming operations. Easement payments are beneficial to landowners within the route and no significant interference with farming operations occurred. Equipment traversed only landowner-approved access routes to minimize disruption to soil, drainage, and crops. Hiland’s crop loss compensation program compensated landowners for any crop damage caused by construction. Hiland will also compensate landowners for crop damage that results from future pipeline maintenance and repairs.

In general, construction activity can cause short-term disruption of livestock operations and can inconvenience farm activities. Possible impacts include removal or damage of fences, gates, and private roads. Hiland worked to minimize construction interference. Temporary access across the ROW was provided to allow for livestock and farm equipment movement, as needed. Temporary fences and gates were constructed as necessary to prevent livestock from entering into the construction zone. The Alexander Pipeline was constructed in a timely manner and, upon completion, fences, gates, and roads were restored to pre-construction conditions, to the extent reasonably practicable.

C.5 (c) Lands Suitable for Irrigation

Pursuant to Section 69-06-08-02(2)(h) of the North Dakota Administrative Code, this criterion does not apply to underground transmission facilities such as the Alexander Pipeline. No above-ground facilities will be constructed on irrigated land.

C.5 (d) Surface Drainage Patterns

Construction of the Alexander Pipeline did not alter surface drainage patterns. Streams, swales, ditches, and other natural drains were restored to pre-construction contours after construction was complete. The pipeline was installed beneath drainage ditches in a manner that will not interfere with flow or future maintenance efforts by landowners or the drainage authority. Drainage ditches were bored. Mitigation measures included the installation of the pipe at a sufficient depth to avoid being encountered by drain cleaning equipment. Above-ground facilities were constructed in a manner that minimizes alteration of surface drainage patterns.

C.5 (e) Groundwater Flow Patterns

Groundwater moves under the influence of gravity from areas of higher potential (recharge) to areas of lower potential (discharge). The rate of groundwater flow is indicated as only a few feet per year in the principal aquifers.

Information concerning groundwater is generally available in, or can be estimated from, North Dakota county groundwater resource studies. The groundwater flow patterns from aquifer systems in the Alexander Pipeline study area that contain suitable water are summarized as follows:

The Tongue River aquifer system underlies all of McKenzie County at a depth of 140 to 500 feet below land surface in most areas. Water from the Tongue River aquifer system is not suitable for irrigation or municipal purposes. However, it is suitable for domestic and livestock uses. Water within the aquifer system generally flows south to north in McKenzie County.

The Charbonneau and Tobacco Garden Aquifers in McKenzie County are suitable for domestic and livestock supplies, and some parts of the aquifers are suitable for municipal and industrial supplies and irrigation use. These aquifers generally flow north with the exception of the western part of the Charbonneau aquifer, which flows westward.⁹

Further aquifer details are provided in Section B.8 (a) Water Resources-Ground Water.

Groundwater flow could have potentially been altered by pipeline construction through blasting and trenching activities. However, no exposed bedrock or areas of shallow bedrock were encountered, therefore blasting was not conducted. Trenching may have temporarily disturbed the level of groundwater and increased the sediment in the groundwater. However, given the shallow depth of construction activities and the relatively deep location of the area's aquifers, installation of the Alexander Pipeline did not have a significant impact on regional groundwater flow patterns.

Groundwater could have been affected by accidental discharges of regulated materials, such as fuel, lubricants, and coolants used during construction. However, no reported incidents occurred during construction. Hiland's EMP located in Tab 5 and supporting diagrams in Tab 6 outline precautions that Hiland took to prevent sedimentation or other materials from entering the water supplies in the area. Alexander Pipeline contractors had a current oil spill prevention control and countermeasure plan in place, which requires implementation if the facility contains an aggregate oil storage capacity above 1,320 gallons, consistent with US Environmental Protection Agency requirements outlined in 40 C.F.R. 112. Regardless of the total storage capacity, no bulk oil storage facilities were sited within 100 feet of surface water.

C.5 (f) Impact on Noise Sensitive Land Uses

One residence is located within 500 feet of the Alexander Pipeline. No other sensitive noise receptors, such as schools or hospitals, are located in the vicinity of the Alexander Pipeline. During construction, the residence in close proximity to the construction experienced short-term increases in construction-related noise. The heavy construction equipment needed to construct the Alexander Pipeline generated a short-term increase in ambient noise levels. The increase in ambient noise levels due to heavy equipment operation was limited to the period of construction, typically during daylight hours.

⁹ M.G. Croft, *Ground Water Resources of McKenzie County, North Dakota*, North Dakota Geological Survey Bulletin 90, part III, and North Dakota State Water Commission County Ground-Water Studies 37, part III, p. 57 (1985).

No significant noise is expected to be generated by the Alexander Pipeline during normal operations. No mid-route stations are going to be added to boost capacity.

C.5 (g) Impact on Visual Effect on the Adjacent Area

Above-ground facilities that were constructed as part of the Alexander Pipeline include mainline valves, line markers, cathodic protection equipment, and test stations. Mainline valves were sited at existing above-ground facility sites. Other than these permanent above-ground facilities, the Alexander Pipeline impacts to visual effects were limited to periods of construction activities.

C.5 (h) Impact on Extractive and Storage Resources

No extractive or storage resources were identified that would be affected by the Alexander Pipeline. The Alexander Pipeline does not pose a hindrance for accessing oil and gas resources.

C.5 (i) Impact on Wetlands and Water Bodies

Impacts to water bodies were avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline. Efforts have been made and will continue to be made to restore all areas of disturbed wetland vegetation. No future above-ground facilities were constructed in wetland areas.

Waterbody crossings are described in Section B.8.

C.5 (j) Impact on Woodlands and Wooded Areas

Tree rows and woody areas occur as isolated islands or rows throughout the Alexander Pipeline survey area. Impacts to trees were avoided to the extent practicable in a manner compatible with safe operation, maintenance, and inspection of the pipeline.

While a pre-construction tree count was not conducted, a North Dakota-based environmental consulting firm was engaged to estimate the number of trees likely impacted by the Alexander Pipeline. In accordance with the Commission's Specifications, a desktop review and field visits to the Alexander Pipeline survey area were conducted in June of 2014, to determine the number and species of trees in each potential area that were impacted. Only trees 1-inch in diameter at breast height or greater were inventoried during the survey.

Survey findings concluded no trees were removed in the Alexander Pipeline ROW and additional removal is not anticipated.

C.5 (k) Impact on Radio and Television Reception, and Other Communication of Electronic Control Facilities

No impacts on television or radio reception or communication or electronic control facilities will occur as a result of the Alexander Pipeline.

C.5 (l) Impact on Human Health and Human Safety

During construction, residences and businesses in close proximity to construction activities were exposed to short-term increases in construction-related noise and dust. The construction ROW and access roads near residential areas were watered down to control dust during construction in instances of excessive dust. After construction was completed, measures to stabilize and re-vegetate the ROW were promptly taken to prevent further dust emissions.

The heavy construction equipment needed to install the pipeline generated unavoidable short-term increases in ambient noise levels. Increases in ambient noise levels due to equipment operation were limited to the period of construction and were generally limited to daylight hours. No noise is generated by the pipeline during normal operations.

No residences or other occupied structures were razed due to construction. Construction may have temporarily restricted access to residences along the pipeline route. When this was the case, Hiland either limited the time such restrictions were in place or made arrangements to accommodate the landowner's access needs. Although developers will have to abide by state and/or local ordinances and easement restrictions, residential developments are not precluded by the Alexander Pipeline.

Causes of and Prevention of Accidents on Pipelines

The major causes of pipeline leaks in the United States are corrosion (both internal and external), excavation damage, pipe or weld failure, incorrect operations, or natural causes (e.g., floods or outside force). To prevent these categories of failures, Hiland has constructed and will maintain the Alexander Pipeline to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe utilized meets US DOT Pipeline and Hazardous Material Safety Administration ("PHMSA") federal codes under 49 C.F.R. Part 195 (referred to hereafter as PHMSA regulations), and construction methods followed standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and API. As a safety measure, the pipeline is designed to withstand pressures over and above its normal operating pressures and will operate according to all applicable laws, rules, and regulations. All pipe was inspected and integrity-tested at the factory and transported per the highest technical standards. All pipe was manufactured with FBE coating to protect against corrosion. The actual installation of the pipeline and all construction and testing records were subject to inspection, including by PHMSA inspectors. Although PHMSA does not conduct field inspections on rural, non-exempt pipelines such as the Alexander Pipeline under DOT 195, the pipeline complies with federal regulatory PHMSA requirements, including the integrity testing of the pipeline through the use of internal inspection devices.

The pipeline was subjected to careful testing to verify integrity and compliance with specifications. PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing such as checking coating integrity. Hiland performed as near as possible to 100% X-ray inspections on girth-welded pipe. The percentage of welds inspected varied; however, the percentage of welds inspected never fell below the requisite 10%.

Additional Alexander Pipeline inspections included internal inspection of the entire length of the pipeline using a tool known as a caliper pig, and hydrostatically testing the pipeline to determine

the MOP. The pipeline was placed into service only after inspection verified compliance with all construction standards and requirements.

The pipeline is maintained and inspected according to PHMSA regulations, industry codes, and prudent pipeline operating techniques. All of Hiland's pipelines are externally coated to resist corrosion, internally inspected at regular intervals using in-line inspection technology, and equipped with a cathodic-protection system to prevent external corrosion.

Hiland performs weekly aerial patrols on the pipeline. The Hiland System rights-of-way that are designated Class 1 are patrolled via foot patrol annually. Road crossings are inspected via foot patrol semi-annually. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines.

Hiland also conducts extensive public education and outreach programs that exceed industry (API Recommended Practice 1162) and PHMSA (49 C.F.R. § 195.440) requirements concerning public awareness of pipelines and pipeline safety. All Hiland pipelines are marked with signage and warnings, per federal regulations, at road and highway crossings, railroad crossings, navigable rivers, and other locations to alert the public to the presence of underground lines and to provide information, contact numbers, and emergency data.

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

Hiland's Ten-Year Pipeline Accident Record

Based on a search of the U.S. Coast Guard's National Response Center incident database for the last ten years in North Dakota, Hiland has had only three incidents on its pipeline systems in North Dakota.

On October 16, 2013, Hiland discovered a small leak while performing above-ground, routine maintenance on the right-of-way for its 4-inch, steel, underground crude oil gathering pipeline in Divide County, North Dakota. The affected section of the pipeline was immediately shut down, depressurized, and isolated.

Approximately 20 barrels of oil leaked in the immediate vicinity of the pipeline on company right-of-way land. Hiland identified the source to be a newly formed pinhole in the pipe, which was installed and commissioned in the first quarter of 2013. Hiland submitted the affected cross-section of the pipe to an independent laboratory to determine the cause of the pinhole.

Within an hour of learning of the leak, Hiland notified all appropriate regulatory agencies, completed a North Dakota spill report and filed a report with the National Response Center. Hiland also notified the Divide County Emergency Response Manager, the USFWS, and the landowner the same day. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

On March 20, 2014, Hiland representatives discovered that approximately 800 barrels of crude oil were released from secondary containment resulting from a flange gasket failure on a pipeline in McKenzie County. Within hours, Hiland notified all appropriate regulatory agencies, completed a North Dakota spill report and filed a report with the National Response Center.

Hiland also notified the landowners the same day. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

On November 2, 2014, Hiland discovered and reported a valve failure on an above ground pipe, 8-inches in diameter, which resulted in the release of approximately 55 barrels of crude oil in Mountrail County. Once the leak was identified, the line was shut down and isolated. Hiland performed on-site remediation until the area was restored. No injuries occurred as a result of the incident.

C.5 (m) Impact on Animal Health and Safety

Construction activity within the Alexander Pipeline ROW had temporary impacts on domestic animals and wildlife. The clearing of vegetation temporarily reduced cover, nesting, and foraging habitat for some species. However, species will generally move into adjacent habitats, away from the disturbance area. Once habitat alterations were reclaimed, wildlife reestablished within the area.

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

C.5 (n) Impact on Plant Life

All areas where vegetation was removed were re-vegetated in accordance with applicable county agency standards and landowner requests. There were no permanent impacts to vegetation. Special consideration was taken for known occurrences of sensitive populations and habitat which could potentially establish new sensitive populations within the Alexander Pipeline survey area.

C.6 Policy Criteria (N.D.A.C. § 69-06-08-02(4))

The Commission may give preference to an applicant that will maximize benefits resulting from the adoption of policies and practices identified in Section 69-06-08-02(4) of the North Dakota Administrative Code. These policies, and the extent to which the Alexander Pipeline aligns with or reinforces these policies, are discussed further below.

C.6 (a) Location and Design

Hiland believes that the Alexander Pipeline utilizes an optimal alignment. No designated Exclusion Areas were crossed by the route.

The Alexander Pipeline involved installing 8-inch nominal diameter pipeline with a nominal wall thickness of 0.188 inches with fusion bonded epoxy (FBE) coating denoted as American Petroleum Institute (API) Code 5L specification X52 pipeline pipe. For crossings, 0.252 inch wall thickness FBE coated pipe was used. The maximum temperature of the crude is 120°F, which is within design parameters. However, the Alexander Pipeline will typically operate between 60°F and 120°F.

The valves are 8-inch ANSI 600, flange end by flange end, full port, rising stem gate valves and similar ball valves. These valves were manufactured in accordance with API Standard 6D "API Specification for Steel, Gate, Plug, Ball and Check Valves for Pipeline Service." The MOP of the valves is 1,440 psig.

The carbon steel pipe installed meets US DOT criteria outlined in 49 C.F.R. § 195.11. The Alexander Pipeline was constructed per 49 C.F.R. § 195.200, and will be operated and maintained per 49 C.F.R. § 195.400.

The Alexander Pipeline was designed and is operated in a manner that meets or exceeds state and federal engineering, safety, and operational design standards.

C.6 (b) Training and Utilization of Available Labor in this State for the General and Specialized Skills Required

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

C.6 (c) Economies of Construction and Operation

Utilization of the Alexander Pipeline as a transmission line is believed to be the most cost-effective and operationally sound means of meeting Hiland's delivery obligations. Please refer to section C.2 (g) of this Application and section C.2 of the Application for a Certificate of Corridor Compatibility for further discussion of economic impacts and alternatives.

C.6 (d) Use of Citizen Coordinating Committees

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

C.6 (e) Commitment of a Portion of the Transmitted Product for Use in this State

The Alexander Pipeline receives deliveries of crude oil produced in northwestern North Dakota. This market flexibility is critical to assure the best overall value is obtained for North Dakota's crude oil production. The Alexander Pipeline will provide needed capacity to transport increased production of crude oil from the Bakken and Three Forks formations.

C.6 (f) Labor Relations

The Alexander Pipeline did not have any effect on labor relations within the State of North Dakota during construction.

C.6 (g) Coordination of Facilities

Existing Hiland crude pipelines and the Alexander Pipeline, with their associated pumping, control, and operating systems, will be used in conjunction with each other to optimize system capacity.

C.6 (h) Monitoring of Impacts

Any construction-related impacts of the Alexander Pipeline were mitigated through the use of best management practices, appropriate construction techniques, and environmental inspection during and following completion of construction. Following construction of the Alexander Pipeline, a thorough inspection was performed to ensure restoration efforts were successful. Monitoring and treatment of noxious weeds and/or invasive species will be conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness. Ongoing environmental inspection will continue to be conducted.

C.6 (i) Utilization of Existing and Proposed Rights-of-way and Corridors

The Alexander Pipeline was constructed in a new 75-foot wide temporary construction ROW. Hiland has acquired 50-foot permanent easements for the Alexander Pipeline. Typical ROW configuration is shown in Figure 3.C.1.

Hiland has acquired either fee interests or easements for all Alexander Pipeline sites.

Hiland acquired the right to utilize additional temporary workspace from the landowners, where necessary, during construction. The use of unauthorized workspace was prohibited without the approval of the landowner and Hiland. In all cases, the amount of additional temporary workspace utilized was kept to the minimum necessary to safely conduct work. Temporary workspace was not restricted by or subject to permanent easement restrictions upon completion of construction.

Typical ROW Layout

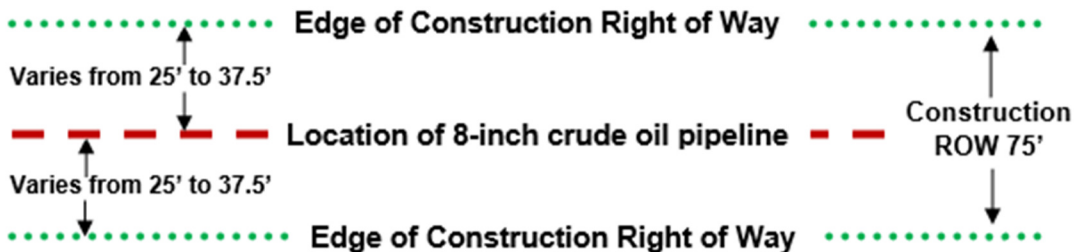


FIGURE 3.C.1 – Typical Right-of-Way Configuration

C.6 (j) Other Existing and Proposed Transmission Facilities

Hiland constructed an additional transmission pipeline in Montana connecting to the Market Center System near Dore, North Dakota. The Double H pipeline will transport crude from Dore, North Dakota to Guernsey, Wyoming. The Double H pipeline started operation in February 2015.

Enbridge Pipelines' Sandpiper Pipeline crude oil project would carry Bakken crude oil from Beaver Lodge, North Dakota to an existing terminal in Superior, Wisconsin, with a mid-route connection to the Clearbrook, Minnesota crude hub. This pipeline is expected to be completed in early 2016. Current projections expect a 225,000 to 375,000 bbls/day capacity depending on shipper commitments. This project will provide capacity for intrastate transports from Beaver Lodge south of Tioga to the eastern edge of the state, and ultimately export capacity to the Great Lake region refiners.

Paradigm Midstream Services - ND, LLC and Phillips 66 Partners plan to construct a 70-mile long pipeline and other facilities to transport crude oil from Johnson's Corner in McKenzie County, North Dakota, to Stanley Station in Mountrail County, North Dakota with connections to Dakota Plains Holdings, Inc.'s Pioneer crude oil rail terminal located in New Town in south Mountrail County, North Dakota. The pipeline will also tie into Enbridge Pipeline's station located near Stanley in north Mountrail County. The interconnection will allow access to all of Enbridge North Dakota's existing pipeline as well as the Sandpiper Pipeline currently under construction. Enbridge also operates a crude oil rail terminal at Berthold. The intrastate pipeline and its interconnections to rail terminals and other pipeline systems will provide access to multiple refinery markets throughout the United States.

Energy Transfer Partners/Phillip 66 Company is expecting to build the 1,100 mile long Dakota Access Pipeline to move crude oil from North Dakota to Patoka, Illinois. The pipeline, with an initial capacity of 320,000 barrels per day and expandable to 575,000 barrels per day, will allow shippers to access markets in the Midwest, East Coast or Gulf Coast in addition to a new rail terminal planned in Illinois. The 16-inch to 30-inch diameter pipeline is expected to begin operation in 2016. The pipeline would originate near Stanley in Mountrail County, loop west along the north side of Lake Sakakawea, and cross the Missouri River near Fort Buford. The pipeline will then transect McKenzie County, connecting to new terminal tankage at both Watford City and Johnson's Corner until it parallels the Northern Border natural gas pipeline corridor to exit the state to the southeast.

TransCanada's Keystone XL pipeline project is a proposed 1,179-mile 36-inch diameter crude oil pipeline. This pipeline would extend from Hardisty, Alberta to Steele City, Nebraska. Along with transporting crude oil from Canada, the Keystone XL Pipeline will also support the significant growth of crude oil production in the United States from producers in the Bakken region of Montana and North Dakota. The pipeline's reported capacity is 830,000 barrels of oil per day to Gulf Coast and Midwest refineries.¹⁰ If the Keystone XL is built, True Oil Company's Thunderbird pipeline, the BakkenLink pipeline, and Hiland's Double H pipeline are all expected to proceed with connections at Baker, Montana to ship crude to Gulf Coast refineries.

¹⁰ TransCanada. "Keystone XL Pipeline," available at <http://keystone-xl.com/about/the-project/> (accessed on March 2, 2015).

C.7 Design and Construction Limitations

See Section A.3 of the Certificate of Corridor Compatibility Application (see Tab 1).

C.8 Economic Considerations

See Section B.2 (g) of this Route Permit Application and Section C of the Certificate of Corridor Compatibility Application (see Tab 1).

SECTION D MITIGATION MEASURES

D.1 Measures to Preserve the Human Environment

Hiland requires its construction contractors to clean up personal litter, bottles, and paper deposited by ROW preparation and construction crews on a daily basis. Waste and scrap produced during construction is always removed and properly disposed of in accordance with applicable regulations prior to the completion of construction.

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

Prior to construction of the Alexander Pipeline, Hiland obtained applicable permits for road crossings from McKenzie County. Hiland also obtained permission from all owners of private roads, including oil lease roads, to cross said roads. Temporary signs were posted at each crossing as appropriate to alert motorists of construction activity. Gravel roads were bored, minimizing interference with traffic flow caused by construction activities for the Alexander Pipeline.

D.2 Measures to Protect Terrain and Geological Resources

Hiland restored the area affected by Alexander Pipeline construction to pre-construction contours to the greatest extent practicable. Measures such as slope breakers, erosion control blankets, and re-vegetation were employed to maintain the stability of slopes along the ROW. No crown of backfill material was left over the trench in wetlands. Restoration was compatible with the safe operation, maintenance, and inspection of the Alexander Pipeline.

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

D.3 Measures to Protect Soils

For construction of the Alexander Pipeline, Hiland implemented temporary and permanent erosion control measures as specified in the EMP (Tab 5 and Tab 6). The EMP was included in contract documents and enforced throughout construction of the Alexander Pipeline.

Temporary erosion and sedimentation control measures included the installation of silt fences, straw bales, slope breakers, trench breakers, erosion control fabric, and mulch.

To minimize potential impacts on soil productivity as a result of the Alexander Pipeline, topsoil was segregated during trench excavation in agricultural land, unsaturated wetlands, and other areas where soil productivity is an important consideration. Topsoil in cropland was removed to the depth of cultivation or a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil. After the trench was backfilled, topsoil was returned to its approximate original location. Compaction of agricultural soils was minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of

compaction could have occurred in agricultural lands, deep tillage equipment was utilized to loosen the soil to the extent reasonably practicable.

Hiland retained environmental experts to train Hiland's construction inspectors to monitor the contractor's compliance with applicable requirements to protect soil resources during construction of the Alexander Pipeline.

D.4 Measures to Protect Vegetation and Wildlife

Hiland cleared the ROW to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the Alexander Pipeline.

Utilizing the measures discussed in Section C.5 (a) above, Hiland and its contractors effectively controlled or limited the spread of invasive plant species through control treatments and avoidance of existing populations where possible. Treatments were initiated prior to construction to lessen the potential for this activity to disperse propagules along the freshly disturbed route. Monitoring and treatment are conducted on an annual basis to ensure a high degree of control and maximize treatment effectiveness.

In areas that required permanent re-vegetation, Hiland specified appropriate seed mixes, application rates, and seeding dates, taking into account recommendations of appropriate state and federal agencies and landowner requests. In non-agricultural areas, vegetation cleared from extra workspace was allowed to re-vegetate after construction depending on arrangements with the landowner.

Over the next three years, Hiland will continue to work to re-establish vegetation consistent with prior cover types in each area. Hiland will similarly re-vegetate any areas affected by future construction.

Hiland took appropriate precautions to protect livestock and crops during construction. These same measures are expected to be implemented during any future Alexander Pipeline construction activities. Operation of the Alexander Pipeline has not and is not anticipated to significantly affect terrestrial wildlife, fisheries resources, or other aquatic species. Shelter belts and trees were protected and restored by Hiland to the extent practicable in a manner compatible with the safe operation, maintenance, and inspection of the Alexander Pipeline, and in accordance with the Commission's tree and shrub mitigation specifications.

D.5 Measures to Protect Land Use

Hiland obtained and complied with applicable county permits regulating zoning and land use for the Alexander Pipeline. These permits include a Pipeline Utility Permit and a Road Crossing Permit. Hiland retained one or more construction inspectors to monitor compliance with environmental conditions of county permits during Alexander Pipeline construction activities.

Following construction of the Alexander Pipeline, Hiland repaired surface drains disturbed during ROW preparation, construction, and maintenance activities. Hiland repaired private roads and farm lanes damaged when moving equipment or when obtaining access to the ROW. Hiland repaired or replaced fences and gates removed or damaged as a result of ROW preparation, construction, or maintenance activities.

The Alexander Pipeline was installed at a minimum depth of 48 inches from the surface contour to minimize the potential for environmental damage resulting from deep tillage activities, unless modified to accommodate special construction issues at a particular site.

Shelter belts and trees were avoided by Hiland to the extent possible in a manner compatible with the safe operation, maintenance, and inspection of the Alexander Pipeline.

D.6 Measures to Protect Water Resources

Hiland's EMP describes best management practices that were implemented to minimize off-site erosion from surface water runoff and to protect water and soil resources within the Alexander Pipeline ROW.

No additives to discharge water were permitted without written approval from Hiland, in accordance with the applicable permits. Construction inspectors with environmental training monitored compliance with permits. Where appropriate, water was discharged into an energy dissipation and/or filtering device to remove sediment and to reduce the erosive energy of the discharge.

D.7 Measures to Protect Cultural Resources

Based on the results of the Class I and Class III cultural resource inventories, a finding of "No Historic Properties Affected" has been issued by Beaver Creek, provided that the recommendations were followed as discussed in section B.6 for the Alexander Pipeline.

An "Unanticipated Discovery Plan" has been developed should unexpected artifacts be uncovered during future Alexander Pipeline construction. The plan has been sent and approved by the SHPO. Beaver Creek recommends that the "Unanticipated Discovery Plan" approved by the SHPO be used during any future construction phase of the Alexander Pipeline.

Unanticipated Discovery Plan

In order to minimize the potential for the accidental discovery of cultural resources, Hiland conducted intensive pedestrian inventories along the entire Alexander Pipeline route. To ensure that Hiland maintains full and complete compliance with all Federal and State regulations concerning the protection of cultural resources, an Unanticipated Discovery Plan has been prepared for the Alexander Pipeline. Future construction may result in the discovery of unanticipated cultural resources, or of cultural resources in areas where they were not expected to occur.

All inspectors have the responsibility to monitor the construction of sites for potential archaeological remains throughout construction. If, during the course of construction, sites for potential cultural resources are identified, the inspector will immediately stop tasks in the vicinity of the potential find and make work stoppage recommendations to the Construction inspector. Should a work stoppage authority be deemed necessary, Hiland will notify the SHPO and will inform the archaeological consultant who will survey the site and provide an immediate verbal report to Hiland and the SHPO. Hiland will continue to consult with the SHPO as per the requirements of Section 106 of the National Historic Preservation Act ("NHPA"). The contact is:

Paul R Picha, Chief Archaeologist
North Dakota State Historic Preservation Office
State Historical Society of North Dakota
612 East Boulevard Avenue
Bismarck, North Dakota 58505-0830
(701) 328-3574

If the unanticipated discovery is determined to be not eligible for inclusion on the National Register of Historic Places (“NRHP”), Hiland will proceed with the Alexander Pipeline following written concurrence from the SHPO. If the site is determined to be potentially eligible for inclusion on the NRHP, additional work such as a Determination of Eligibility of Data Recovery will be performed as required/approved by the SHPO. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other Federal and State regulations have been successfully completed.

If human remains and/or a burial are encountered, these remains, features, and any associated artifacts shall be left undisturbed, work at the site of discovery shall cease immediately, and the site shall be secured from further trespass. Hiland shall immediately contact the SHPO and local law enforcement and shall not resume work at the site until further notice from the SHPO per North Dakota Century Code Section 23-06-27 – Protection of human burial sites, human remains and burial goods, and North Dakota Administrative Code Chapter 40-02-03 – Protection of Prehistoric and Historic Human Burial Sites, Human Remains, and Burial Goods.

Under no circumstances will human remains be removed from the site without completing all coordination processes with the local law enforcement agency, medical examiner, the SHPO, and Native American representatives, as appropriate. Further work at the site will be suspended until all criteria of Section 106 of the NHPA and other related state and Federal regulation have been successfully completed.

SECTION E QUALIFICATIONS OF PERSONS CONTRIBUTING TO THE STUDY

The qualifications of the personnel who contributed to the route application include:

(1) Jim Suttle, Vice President – Kinder Morgan, Inc.

Degree: Bachelor of Art — Political Science, Wichita State University
Masters of Philosophy, Houston Baptist University

Experience: 34 years in petroleum industry, serving in multiple assignments including pipeline design, operation and construction. Senior Vice President of Hiland Crude, LLC since 2010.

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

Degree: Bachelor of Science - Chemical Engineering, University of North Dakota
Masters in Management, University of Mary

Experience: 33 years' experience in petroleum refining and fuels transportation field as well as regulatory affairs and compliance.

Professional License:

Registered Professional Engineer: North Dakota, South Dakota, Montana

(3) Karine Becker, Project Manager – Biology/GIS – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science, Natural Resource Management,
University of Minnesota - Crookston

Experience: 6 years' experience in natural resource management.

Other Training: GIS, Listed and candidate species in the Endangered Species Act compliance in North Dakota, Bald and Golden Eagle Protection Act, piping plover and least tern surveying, prairie restoration, Keitu In-Service Classes on North Dakota Plant and Animal Habitat Identification, Raptor Identification

(4) Ryan King, Staff Consultant – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Science Construction Management,
North Dakota State University
Master of Natural Resources Management,
North Dakota State University

Experience: 2 years' experience in botany and wildlife surveys throughout western North Dakota and eastern Montana.

Other Training: Keitu In-Service Class on North Dakota Plant and Animal Habitat Identification, Raptor Identification.

(5) Josh Swann, Field Technician – Keitu Engineers & Consultants, Inc.

Degree: Bachelor of Arts Ecology and Evolutionary Biology
University of Colorado - Boulder

Experience: 3 years' experience in field technical services and regulatory affairs

Other Training: GIS, Groundwater Monitoring and Sampling, Keitu In-Service Class on
North Dakota Plant and Animal Habitat Identification, Raptor Identification.

SECTION F MAPS

See Tab 4, Figure 4.B, for the Alexander Pipeline Mapbook and Tab 7 for ESRI software “shapefiles.”

SECTION G OTHER MATTERS

The information provided below is in accordance with North Dakota Century Code Sections 49-22-08.1(1)(e), (f), and (g).

G.1 Right-of-Way Preparation, Construction, and Reclamation Procedures

Critical safety aspects of pipeline installation are governed by US DOT regulations subject to the jurisdiction of the PHMSA, which has tended to standardize installation techniques. The advance of technology has introduced significant improvements in the techniques and equipment available to install underground pipelines, reducing both the time required and the size or “footprint” of impact.

Construction of the Alexander Pipeline followed standard techniques employed by other projects installed in North Dakota. Typical ROW preparation, pipeline construction, and reclamation using girth full penetration welds include: (1) survey and staking of the right-of-way; (2) clearing; (3) front-end grading; (4) right-of-way topsoil stripping; (5) pipeline route staking; (6) pipe stringing; (7) pipe bending; (8) pipe alignment and initial weld; (9) fill and cap with final weld; (10) as built footage; (11) x-ray inspection and weld repair; (12) coating field welds and coating inspection; (13) trenching; (14) lowering pipe into trench; (15) as-built survey; (16) pad, backfill to rough grade; (17) hydrostatic testing and system tie-in; (18) clean-up; and (19) restoration and re-vegetation.

G.1 (a) Survey and Staking

Before construction of the Alexander Pipeline, Hiland crews surveyed and staked the centerline and exterior boundaries of the construction ROW. The exterior boundary stakes mark the limit of approved disturbance areas, which were maintained throughout the construction period. The North Dakota One Call system was utilized to identify and mark the locations of underground utilities in the construction corridor. During this period, equipment involved in pipeline construction was moved onto the ROW using existing roads for access wherever practicable.

G.1 (b) Clearing

Hiland bored under tree rows and therefore no trees or shrubs were removed in the ROW. No merchantable timber was cleared from the ROW.

G.1 (c) Grading

Following clearing, the surface was graded to provide a relatively smooth working surface and a safe working area.

G.1 (d) Topsoil Stripping

Topsoil was stripped and segregated in agricultural areas, cropland, hayfields, pasture, residential areas, and other areas as requested by the landowner along the Alexander Pipeline route in accordance with Hiland's EMP. In unsaturated wetlands, a maximum of 12 inches of surficial soils was also stripped from the trench areas. Topsoil was stripped to the depth of cultivation or a depth of 12 inches, whichever was greater.

G.1 (e) Pipeline Route Staking

Once the topsoil had been stripped and stockpiled, the route was resurveyed and staked.

G.1 (f) Pipe Stringing

Before excavating pipeline trenches, individual joints of pipe were strung along the construction right-of-way and arranged to be accessible to construction personnel. This operation involved specially designed stringing trucks to deliver pipe from pipe yards to the ROW. Small portable cranes and/or side-boom tractors were used to unload the stringing trucks and place pipe along the ROW.

G.1 (g) Pipe Bending

A pipe-bending machine bent individual joints of pipe to the desired angle to accommodate natural ground contours or pipeline alignment. In certain areas, prefabricated fittings were used where field bending was not practicable.

G.1 (h) Pipe Alignment and Initial Weld

After stringing and bending were completed, pipe sections were aligned and placed on temporary supports located adjacent to the proposed trench locations. Pipe ends were attached to each other using short welds or high pressure joining techniques.

G.1 (i) Fill and Cap Segment Welds

Final welds were completed around the entire circumference of the pipe joints in compliance with applicable industry standards and PHMSA requirements.

G.1 (j) As-built Footage

Once welding was complete, Hiland compared the as-built condition and length of the pipeline with construction drawings. Documents were edited to reflect impacts of field decisions as well as final locations of lateral tie-in points, other pipeline apertures, and cathodic protection connections.

G.1 (k) X-Ray Inspection and Weld Repair

PHMSA regulations require that at least 10% of the field welds be inspected using radiological (i.e., X-ray) and/or other non-destructive testing, such as checking coating integrity. Hiland engaged a third-party inspection service provider meeting PHMSA certification requirements to perform X-ray inspections of nearly 100% of the welds. After adequate performance had been

established based on statistically significant data, and each of the Alexander Pipeline's welders had demonstrated proper weld material handling, a reduction in the percentage of welds inspected was considered; however, the percentage of welds inspected never fell below the requisite 10%. When welds were deemed inadequate, appropriate repairs were made consistent with PHMSA regulations and re-inspected. Inspection records were cross-referenced against the final "as-built" footage of the pipeline.

G.1 (l) Coating and Coating Inspection of Field Welds

The pipe was delivered with a factory coating of FBE or similar material to prevent corrosion. Hiland applied coating at welded joints and electronically inspected the pipeline coating before the pipe was lowered into the trench.

G.1 (m) Trenching

Backhoes and/or ditching machines were used to excavate trenches in accordance with PHMSA regulations, which require a minimum 30 inches of cover for normal excavations and 18 to 30 inches of cover in rocky areas. Hiland uses a minimum cover of 48 inches. The trench walls were generally kept vertical to the extent practicable and the trenches were typically 30 to 40 inches wide.

Water from trench dewatering was discharged directly to the ground if there was adequate vegetation along the ROW to filter the water effectively. Where vegetation was sparse or absent, or in environmentally sensitive areas (e.g., adjacent to water bodies or wetlands), straw bale dewatering structures or suitable filtering alternatives were used to minimize siltation in adjacent water bodies.

G.1 (n) Lowering Pipe into Trench

After welding and coating were completed and the trench was excavated, the pipe was lowered into the trench by side-boom tractors.

G.1 (o) As-built Survey

A survey of the final location of the pipeline was made.

G.1 (p) Pad and Backfill to Grade

Bladed equipment or a specially designed backfilling machine was used to backfill the trench to the approximate ground surface elevation. This consisted of replacing the material excavated from the trench. In areas where topsoil had been segregated, subsoil was replaced first, and topsoil was spread uniformly on top. Directly above the pipeline, an excess of soil or "crown" was placed to allow for future settling, except in wetlands.

Construction debris, including wooden supports, welding rods, containers, brush, trees, or refuse of any kind, was not permitted in the backfill. If an excessive amount of rocks was present in the backfill, the pipeline was protected with rock shield or similar protective coating and/or backfilled with clean padding prior to backfilling with the rocky material.

G.1 (q) Hydrostatic Testing

After backfilling, Hiland tested the pipe pneumatically in accordance with the PHMSA regulations to ensure that the system was capable of operating at the design pressure. The testing process involved filling a segment of the pipeline with water and maintaining a prescribed pressure for a specified amount of time.

G.1 (r) Cleanup

Cleanup involved removing construction debris (including litter generated by construction crews and excess rock) and replacing fences removed during construction. In addition, extraneous material that would impede seed bed preparation was removed from the ROW. Fences that were removed to install the pipeline were reconstructed.

G.1 (s) Restoration and Re-vegetation

Following installation and final cleanup of the Alexander Pipeline construction area, original grade and contours were restored to the extent practicable, and temporary and permanent erosion controls were installed. Disturbed areas are in the process of being re-vegetated in accordance with permit requirements, agency input, and site-specific landowner requests. Monitoring will continue until 70% or higher vegetative cover has been established.

G.2 Landowner Issues

G.2 (a) Procedures for Landowner Relations

Hiland has finalized easement agreements with all landowners along the Alexander Pipeline route. Construction occurred after the harvest and prior to the planting season when feasible, minimizing impacts to agriculture.

A brief description of the pipeline was mailed to affected landowners and known tenant farmers. Hiland is committed to providing landowners complete information about the pipeline and keeping them informed throughout the lifetime of the Alexander Pipeline. Hiland personally contacted landowners to discuss methods of calculating damage settlements and tenant's rights, and to address any unique property concerns.

G.2 (b) List of Landowners

By use of county records, a current list of landowners was generated and used to contact residents. In addition to landowners, all known tenant farmers in the construction area were notified prior to pipeline construction. A list of landowners and tenants is provided in Tab 4, Appendix 4.C.

G.3 Operations and Safety

G.3 (a) Pipeline Operation and Control

Hiland's Control Center is monitored by pipeline operators 24 hours a day. The Control Center also serves as an emergency center to receive calls from employees, the public, or public

officials reporting unusual conditions of the pipeline, associated storage or pumping equipment, and/or pipeline failures.

The Alexander Pipeline was also designed to accommodate an instrumented internal inspection device to detect and record the type and location of corrosion or other defects for long-term monitoring of the pipeline integrity.

G.3 (b) Communications Capabilities

Land-lines and satellite communications are used to exchange the necessary computerized data for pipeline monitoring and control. Hiland uses cellular phones as needed to facilitate personnel communications during operation, maintenance, or emergency activities.

G.3 (c) Protection of the Pipe from Damage

Hiland has an aggressive program to educate excavators and the public about the presence of the Alexander Pipeline and prevent damage to the Alexander Pipeline from excavating equipment. Hiland participates in and supports the North Dakota One-Call system.

The Alexander Pipeline is protected from corrosion in a number of ways. The pipeline is covered with a protective coating. In addition, the pipeline is under a cathodic protection system, as required by PHMSA regulations.

G.3 (d) Inspections

Hiland conducts routine inspections of the Alexander Pipeline to determine that the system is operating properly, in compliance with PHMSA regulations.

Each calendar year (not to exceed a 15-month interval), the cathodic protection system is monitored by taking pipe/structure-to-soil readings and, where possible, line current readings. Additionally, each rectifier and anode ground bed used to impose cathodic protection on the pipeline is inspected to ensure proper operation. Repairs and adjustments to the cathodic protection system are either made during the annual survey or during later maintenance activities. At least six times per year, each rectifier and critical cathodic protection interference bond to foreign structures is inspected and corrective measures are taken, if needed.

Hiland also periodically evaluates the effectiveness of its cathodic protection system by conducting supplemental close interval surveys (e.g., close interval pipe to soil, etc.) of the system.

Hiland conducts weekly aerial inspections. These inspections are to verify that no abnormal conditions or dangerous activities, e.g., unauthorized excavation, have taken place along the routes of the lines.

Isolating valves are checked at least twice per year to ensure proper operation. Other components of the Alexander Pipeline, such as tanks and pump stations, will also be routinely inspected.

Hiland periodically inspects the pipeline internally with a tool called a caliper pig. These devices travel through the inside of the pipeline and either mechanically, ultrasonically, or magnetically

examine the condition of the pipe using on-board computers. Results of the inspection are analyzed, and the pipe is manually inspected to verify preliminary findings. Repairs are conducted where necessary.

All overpressure safety devices capable of limiting, regulating, controlling, and/or relieving operating pressures are inspected and tested to ensure the device is in good mechanical condition and functioning properly.

Periodically, government officials inspect compliance with applicable government regulations. Inspections of Hiland's written procedures, records, and facilities are routinely conducted by PHMSA.

G.3 (e) Maintenance

Many other maintenance activities are and will continue to be performed on the Alexander Pipeline. Hiland has a comprehensive preventative maintenance program that meets and, in many cases exceeds, minimum federal safety standards set forth in PHMSA regulations, including 49 C.F.R. Part 195. When facilities are added or replaced, there are comprehensive standards for their design and installation in both Hiland procedure manuals and contract specifications. Repair pipe is pre-tested and other components used to repair the pipeline meet national standards and regulatory requirements. Other procedures, such as welding procedures, movement of the pipe, coating repair, corrosion control, and tank maintenance are all guided by written procedures which have been reviewed by the PHMSA inspectors.

G.3 (f) Training of Personnel

Hiland has established a comprehensive orientation, technical, safety, emergency, and on-the-job training program that is in compliance with the Operator Qualification rules issued by PHMSA under 49 C.F.R. Part 195. As personnel progress in pipeline operation and maintenance positions, they receive hundreds of hours of formal and on-the-job training. Demonstrations of competence are shown through review of job performance, periodic pipeline control system simulators, emergency exercises, welding certification tests, and other functions required to continue safe pipeline operation and maintenance.

G.3 (g) Public Awareness Program

Hiland conducts a public education program to ensure that the affected public (i.e., those who work and live near the Alexander Pipeline), excavators, local public officials, and emergency responders can recognize and avoid or respond to a pipeline emergency. Hiland has also been active at the local, county, and state levels in emergency response planning and joint training to prepare all potential responders to deal with emergencies.

The Alexander Pipeline route is marked at all public road and railway crossings (at a minimum) to increase the public's awareness of the underground pipeline. Additional markings are posted at valves, other pipeline facilities, and stations along the Alexander Pipeline route.

G.3 (h) Emergency Preparedness

Hiland's operating and maintenance practices are aimed at preventing emergencies. However, it is imperative that Hiland be prepared to respond to an emergency should one occur. In addition to the preventative activities described above, Hiland's emergency response program includes pre-planning, equipment staging, notifications, emergency and leak containment procedures, and procedures for engaging the services of area contract spill responders. Emergency Response Plans were prepared for all North Dakota transportation and non-transportation related storage and use facilities with aggregate storage capacities in excess of 1,320 gallons. The Emergency Response Plan was submitted and approved by PHMSA as required by 49 C.F.R. Part 194.