DRAFT
ENVIRONMENTAL ASSESSMENT
Dakota Access Pipeline Project
Crossings of Flowage Easements and Federal Lands

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

EXECUTIVE SUMMARY

In accordance with the National Environmental Policy Act (NEPA) and implementing regulations, the following Environmental Assessment (EA) has been prepared to evaluate the effects of the Dakota Access, LLC (Dakota Access) Dakota Access Pipeline Project (Project or Proposed Action), which would cross lands owned by the federal government or cross lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers (Corps). Specifically the Proposed Action crosses federal flowage easements near the upper end of Lake Sakakawea north of the Missouri River in Williams County, North Dakota and crosses federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota.

This EA was prepared by Dakota Access for the Project on behalf of the Corps as the non-federal representative for compliance with the NEPA Act of 1969, the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations (CFR) 1500-15-8), Corps of Engineers Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements for these crossings, including the National Historic Preservation Act (Section 106). Tribes, Tribal Historic Preservation Offices, State Historic Preservation Offices, the Advisory Council on Historic Preservation, and interested parties were consulted by Corps Omaha District personnel as required through their Programmatic Agreement with tribes that reside within the Missouri River basin.

The Corps takes ownership of this EA and incorporates findings within as part of stipulations to issue a real estate easement and consent to cross flowage easements (federal actions) to Dakota Access for the proposed activity. This action is being completed in accordance with CEQ regulations in Section 1506.5(a) and 1506.5(b), which allow an applicant to prepare an EA for federal actions. The Corps has independently evaluated and verified the information and analysis undertaken in this EA and takes full responsibility for the scope and content contained herein.

Based upon extensive route analysis route and system alternatives, including the preferred route (Proposed Action), no action, system options, and various transportation options, the preferred alternative was chosen, because it best meets the purpose and need while avoiding, minimizing, and mitigating environmental impacts. It would also follow the greatest length of existing disturbed linear utility corridors, traverse property whose landowners have previously granted permissions for similar projects, and would minimize the number of permanent aboveground launchers/receivers and valve sites.

Impacts on the environment would be temporary and not significant as a result of avoiding, minimizing, and mitigating any potential impacts. Impacts on the Missouri River/Lake Oahe are avoided by installing the pipeline via horizontal directional drill (HDD) beneath the feature. Impacts on wetlands are limited to vegetation maintenance in the permanent pipeline easement. No known cultural resources would be impacted by the proposed Project. Dakota Access would comply with all applicable local, state, and federal regulations and permits associated with the construction of the Project. Thus, construction of the proposed Project is not expected to have any significant direct, indirect, or cumulative impacts on the environment.

1.0 INTRODUCTION

In coordination with the U.S. Army Corps of Engineers (Corps), the Applicant, Dakota Access, LLC (Dakota Access) as the non-federal representative for compliance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations (CFR) 1500-15-8), Corps of Engineers Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements, prepared this Environmental Assessment (EA) for the Dakota Access Pipeline (DAPL) Project (Project or Proposed Action). Dakota Access is proposing to construct a new crude oil pipeline that would provide transportation service from points of origin in the Bakken and Three Forks plays in North Dakota through portions of South Dakota and Iowa to a terminus in Patoka, Illinois (**Figure 1**). The operator of the Project is DAPL-ETCO Operations Management, LLC.

1.1 DAPL Project Location

The overall proposed DAPL route is an approximate 1,100 mile long crude oil pipeline project beginning near Stanley, North Dakota, and ending at Patoka, Illinois. In North Dakota, there are two pipeline segments, including the 148-mile Supply Line and the 210 mile Mainline, which total approximately 358 miles across seven counties (Mountrail, Williams, McKenzie, Dunn, Mercer, Morton, and Emmons). The diameter of the pipeline increases incrementally at designated tank terminals from 12 inches to 20, 24, and ultimately, 30 inches. The DAPL pipeline is co-locating with existing pipelines and other linear facilities to the extent practical.

1.2 Purpose and Need of the Project

The Project purpose is to efficiently and safely transport crude oil from the Bakken and Three Forks production region in North Dakota to a crude oil market hub located near Patoka, Illinois. The Dakota Access Pipeline is being designed to safely carry 570,000 barrels per day (bpd) or more of crude oil (approximately 450,000 bpd initially) through the states of North Dakota, South Dakota, Iowa, and Illinois and ultimately terminating in Patoka, Illinois. From the Patoka hub, the crude oil would be transported by other pipelines to refineries located in the Midwest and the Gulf Coast, where 80% of the U.S. refining capabilities exist today to further the country's goal of energy independence and support the U.S. consumer's energy demand.

1.3 Authority and Scope of the EA

The proposed Project crossings of Corps-owned lands and easements would require real estate actions and regulatory permits from the Corps, which are the federal actions associated with this EA.

To obtain comments on the EA and Project, Dakota Access sent a request for comment letter on behalf of the Corps as the non-federal representative for compliance with NEPA, the CEQ Regulations (40 CFR 1500-15-8), Corps of Engineers Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements for these crossings. In addition to other requirements, the Lake Oahe and Missouri River crossing portions of this Project shall comply with the National Historic Preservation Act (Section 106). Further, tribes, Tribal Historic Preservation Offices, State Historic Preservation Offices, the Advisory Council on Historic Preservation, and interested parties were consulted with by Corps Omaha District

personnel as required through their Programmatic Agreement with tribes that reside within the Missouri River basin.

These crossings require Department of the Army (DA) authorization under Section 404 of the Clean Water Act (CWA Section 404) and/or Section 10 of the Rivers and Harbors Act (Section 10). Separate Corps authorizations are being sought for Section 404, Section 10, and Section 408 crossings along the route. The Corps Regulatory branch is evaluating each separate and distinct crossing of waters of the United States as a single and complete project, consistent with the requirements of Nationwide Permit 12 (NWP 12) for utility lines. A single and complete project includes crossing a single water at a specific location.

This effect analysis is being completed in accordance with CEQ regulations in Section CFR 1506.5(b), which allow an applicant to prepare an EA for a federal action in coordination with the lead federal agency (i.e., Corps). The Corps will make a final determination regarding compliance of the activities with NEPA and NWP 12 with the completed information contained herein. The Corps independently evaluated and verified the information and analysis undertaken in this EA and takes full responsibility for the scope and content contained within.

2.0 ALTERNATIVES

The Project would be Energy Transfer's (Company's) first asset in the state. For this reason, the manipulation of operating pressures to increase transport capacity in pipelines or altering existing infrastructure to increase storage and transport capacity are not viable options to meet the Project's objectives or shippers' demands. Shipping and routing alternatives were evaluated for the pipeline route as a whole, including through the Proposed Action Areas, which are the focus of this evaluation and discussed below.

2.1 Alternatives Considered but Eliminated from Detailed Analysis

2.1.1 Alternative 1 – Trucking Transportation Alternative

Currently, due to a lack of transport capacity in the Williston Basin, approximately 1% of the crude oil is moved via truck (Kringstad, 2014). While trucking is instrumental in the gathering and distribution of crude on a limited scale, trucking as an alternative for transporting the volume of crude oil the distances planned for the Project is not viable. Factors such as road safety, roadway capacity, and a lack of reliability due to seasonal constraints, in addition to other logistical issues involving availability of labor force, trailer truck capacity, and economics, all contribute to truck transportation not being a realistic alternative.

A sharp increase in traffic on North Dakota roads as a result of the rapid expansion in the number of commercial trucks linked to the oil industry speaks to the issues associated with road safety. In 2012, the Federal Motor Carrier Safety Administration reported a traffic fatality rate in North Dakota of 0.48 per million vehicle miles traveled, with 48 deaths involving a bus or large truck, far surpassing any other state (U.S. Department of Transportation [DOT], 2014). In the pre-boom years of 2001 to 2005, there was an average of only 13 annual deaths involving commercial trucks. Furthermore, the economic cost of severe truck crashes has more than doubled between 2008 and 2012. Much of the increase in the fatality rate can be attributed to the energy production boom, along with the fact that the state's infrastructure still consists of single-lane, rural, and unpaved roads in many areas (Bachman, 2014). Harsh winter weather and seasonal road restrictions compromise the reliability of truck transportation even further.

To meet shippers' demands, Dakota Access plans to transport 450,000 bpd approximately 1,100 miles across four states. A pipeline is a safer and more economical alternative than trucking for the volumes transported and distances covered by the Project. Assuming the average oil tanker truck is capable of holding about 220 barrels of oil, the transportation of 450,000 bpd would require a total of 2,045 (450,000/220) full trucks to depart the proposed tank terminals daily, and more than 85 (2,045/24) trucks would have to be filled every hour with a 24-hour/day operation. Time spent in transit, loading/offloading, and additional time for maintenance would add to the number of trucks needed to offset for the Project.

Analysis of infrastructure considerations (the burden of thousands of additional trucks on county, state, and interstate highways, as well as the loading and offloading facilities that would have to be constructed), economic considerations (e.g., labor costs, purchase and maintenance of hauling equipment, fuel, public infrastructure, etc.), and reliability considerations (e.g., weather, mechanical, manpower, road closures) all contribute to making the truck transportation alternative unviable.

2.1.2 Alternative 2 – Rail Transportation Alternative

Reliance on rail as a transportation method in the Williston Basin has drastically increased in recent years, carrying a negligible percentage of the overall market share as recently as 2010 to nearly 60% of the overall market share by mid-2014 (Nixon, 2014). The rise in the use of rail as a primary transportation method has been driven in large part by the rapid increase in production of crude oil coupled with a lack of pipeline capacity to account for additional supplies.

Negative impacts from the growth in popularity of rail as a method of long-distance transportation of crude oil include delays that disrupt the agricultural sector, reductions in coal-fired power plant inventories, and significant production issues in the food production industry. In August 2014, reports filed with the federal government indicated that the Burlington Northern Santa Fe Railway had a backlog of 1,336 rail cars waiting to ship grain and other products, while Canadian Pacific Railway had a backlog of nearly 1,000 cars (Nixon, 2014). For industries, such as those listed, in which the use of pipelines is not an option, the only viable alternative would be increased reliance on trucking, which would exacerbate some of the issues listed in the section above.

Assuming a carrying capacity of 600 barrels per car, a total of 750 rail cars would be required to depart the tank terminal daily to transport 450,000 barrels of crude oil to its final destination. Loading and offloading 750 rail cars in a day would require servicing more than 31 rail cars per hour. With an assumption of 125 rail cars per train, six trains would have to depart the tank terminal every day. With 10 to 12 trains currently leaving the state per day carrying Bakken crude, the DAPL Project would represent a 50 to 60% increase in the number of trains transporting crude oil out of the state, likely exacerbating issues with delays (Horwath and Owings, 2014).

Rail operations on the scale of the DAPL Project do not exist in the U.S. An oil-by-rail facility designed to handle an average of 360,000 bpd has been proposed in the Port of Vancouver, Washington. Known as the Vancouver Energy proposal, the project would be the largest rail terminal in the country (Florip, 2014). A rail transportation alternative to handle the volumes of the DAPL Project would require the design and construction of 125 to 158% of that of the Vancouver Energy proposal.

From a safety standpoint, railroad transport consistently reports a substantially higher number of transportation accidents than pipelines (DOT, 2005). A series of major accidents taking place in 2013 to 2014 in Canada and the U.S. has heightened concern about the risks involved in shipping crude by rail (Fritelli, 2014).

While rail tanker cars are a vital part of the short-haul distribution network for crude oil, pipelines are a more reliable, safer, and more economical alternative for the large volumes transported and long distances covered by the DAPL Project. As such, rail transportation is not considered a viable alternative.

2.1.3 Alternative 3 – Route Alternatives

Major route alternatives were evaluated for the pipeline route as a whole. During the Project fatal flaw analysis and early routing process, Dakota Access utilized a sophisticated and proprietary Geographic Information System (GIS)-based routing program to determine the pipeline route based on multiple publicly available and purchased datasets. Datasets utilized during the Project routing analysis included

engineering (e.g., existing pipelines, railroads, karst, powerlines, etc.), environmental (e.g., critical habitat, fault lines, state parks, national forests, brownfields, national registry of historic places, etc.), and land (e.g., fee owned federal lands, federal easements, dams, airports, cemeteries, schools, mining, and military installations, etc.).

Each of these datasets were weighted based on the risk (e.g., low, moderate, or high based on a scale of 1,000) associated with crossing or following certain features. In general, the route for the pipeline would follow features identified as low risk, avoid or minimize crossing features identified as moderate risk, and exclude features identified as high risk. For example, the existing pipelines dataset was weighted as a low risk feature, so that the routing tool followed existing pipelines to the extent possible to minimize potential impacts. An example of a high risk feature is the national park dataset. Since national parks were weighted for this Project as high risk, the GIS routing program excluded any national parks from the pipeline route to avoid impacts on these federal lands.

Early in the routing phase of the Dakota Access Project described above, the centerline originated in Stanley, North Dakota within Mountrail County where it connected to customer receipt points and headed southwest through Williams County and crossed the Missouri River approximately 8.5 miles east of the Yellowstone River and Missouri River confluence (Figure 12). The centerline then headed southeast across the state and crossed Lake Oahe approximately 10 miles north of Bismarck (Figure 13) and entered South Dakota approximately 35 miles east of Lake Oahe in McIntosh County.

After review of the route alternative using publically available datasets, concerns with some of the areas crossed by the route immediately removed this route alternative as a feasible option. The route alternative was in proximity to and/or crossing multiple conservation easements, habitat management areas, National Wildlife Refuges, state trust lands, waterfowl production areas, and private tribal lands. Since the route alternative crossed north of Bismarck, wellhead sourcewater protection areas were prevalent due to the proximity of the city. The route alternative also crossed an area of the state that is characterized by a more wet landscape when compared to some of the other regions of the state.

In addition to concerns over the environmentally sensitive areas described above, the route alternative included approximately nine additional miles of pipeline to cross north of Bismarck. It was also estimated that an additional 10 to 15 miles of pipe would be needed to avoid the wellhead sourcewater areas near Bismarck and other exclusion areas identified in the GIS routing program, as previously referenced. The additional nine miles of pipeline to cross north of Bismarck would add an exceedance of approximately 145 acres of workspace to get to the customer receipt points. This increase in pipeline distance to avoid the Corps fee-owned properties at Lake Oahe would significantly increase not only the cost of the Project, but also the area of disturbance and potential environmental impacts.

While the route alternative would avoid crossing Corps fee-owned properties at Lake Oahe, the abundance of easement and tribal properties, potential environmental impacts, and significant cost increase result in the route alternative not being a viable option for Dakota Access to meet the purpose and need of the Project.

Crossing the Missouri River at a location that does not contain flowage easements would move the centerline west of the flowage easements in Williams County. This was not considered, given that this would require approximately eight additional miles of pipe, an exceedance of an additional 130 acres of

workspace, and another major river crossing (Yellowstone River) in addition to the Missouri River. Furthermore, state and federal properties are located along the river west of the confluence of Missouri and Yellowstone Rivers.

2.1.4 Alternative 4 – Major Waterbody Crossing Alternatives

Once an optimal route was selected based on the evaluation of impacts discussed in Section 2.1.3, Dakota Access then identified the preferred major waterbody crossing construction method that would meet the purpose and need while minimizing impacts to resources. Pipeline construction methods utilized at waterbody crossings are highly dependent on the characteristics of the waterbody encountered. A variety of waterbody crossing techniques were considered during the Project planning stages for the crossings of major waterbodies, including Dam and Pump, Flume, Open-Cut, and Horizontal Directional Drill (HDD).

Three possible waterbody crossing methods involving the excavation of a trench on the bottom of the waterbody are typically employed on pipeline construction projects. Two different techniques, including dam and pump and flume crossing methods, are typically used on waterbody crossings well under 100 feet in width and require a temporary diversion of flow within the waterbody. Because of the large volume of water within the Missouri River system, it is not feasible to temporarily divert the water either by pump or flume, and these methods were ruled out of consideration for the crossing of the Missouri River and Lake Oahe.

Aside from trenchless or HDD crossing techniques, the only feasible crossing method from a constructability standpoint for the major waterbodies associated with the Proposed Action is the wet open-cut crossing method, in which flow would be maintained throughout installation of the pipeline. This method of construction would require the construction right-of-way (ROW) to extend right up to the waterbody itself, allowing equipment to operate from the banks of the waterbody to excavate a trench. The sensitive habitat adjacent to the banks of the waterbodies would be cleared of vegetation and graded to create a safe and level workspace that could accommodate excavation equipment and spoil storage for the duration of the open-cut installation (approximately 6 months). Since the widths of the Missouri River and Lake Oahe at the crossing locations is such that operating trenching equipment entirely from the banks would not be possible, trench excavation in the waterbodies would require equipment operating from barges. Furthermore, the depth of the waterbodies crossed (15 to 25 feet) exceeds the reach of a backhoe, and the use of mechanical dragline dredgers would be necessary. Spoil dredged from the bottom of the waterbody would be stored on a spoil barge or otherwise temporarily stockpiled in the waterbody itself. This method of excavation would greatly influence the overall sediment load generated in the waterbody for the duration of the installation. The generation of a downstream turbidity plume would have a direct effect on the aquatic habitat of the waterbody. In addition, the operation of equipment within and on the banks of the waterbody has the potential for adverse effects on surface water quality (i.e., potential contamination of surface water resources from fuel or leaks from the equipment). Compared to trenchless technology, the open-cut method would incur far greater impacts on sensitive habitat located on both the banks of the waterbodies and within the waterbodies. Therefore, this method of construction was eliminated from consideration.

The trenchless construction method known as horizontal directional drilling (HDD) was selected as the preferred construction method of the Proposed Action, because this method of construction involves far less impacts on resources. In addition, the Garrison Project – Lake Sakakawea Oil and Gas Management

Plan explicitly states that: Oil and gas pipelines should use directional drilling technology to traverse beneath sensitive habitat areas. Further information regarding the HDD construction method is provided in Section 2.3.2.6 below.

2.2 No Action Alternative

Under the "no action" alternative, Dakota Access would not construct the proposed Project. The "no action" alternative would not provide the infrastructure necessary to transport light sweet crude oil to refining facilities. In northwest North Dakota, exploration and production of oil is a major economic activity, with crude oil production being the primary mineral resource of interest. Although the "no action" alternative itself would not incur environmental impacts, it would also not address the existing demand to transport crude oil to refining facilities.

It is purely speculative to predict the resulting effects and actions that could be taken by another company or Dakota Access' shippers and any associated direct or indirect environmental impacts in response to the "no action" alternative. However, the "no action" alternative has been carried forward in the environmental analysis of this EA to provide a comparison between it and the impacts of implementing the Preferred Alternative.

2.3 The Proposed Action (Preferred Alternative)

2.3.1 Location and Detailed Description of the Proposed Action

The DAPL Project originates near Stanley, North Dakota, traversing westerly northwest of Williston then turning south, crossing the Missouri River and traverses southeasterly across the state, exiting through the central portion of the southern border. Dakota Access proposes to construct the pipeline, ranging in size from 12 to 30 inches in diameter, so that the majority of lands crossed would be privately-owned lands. The locations for collecting product into the proposed system were largely fixed based on results of the open season, which guided the routing of the supply line. Connecting the input locations was largely a matter of minimizing length and maximizing the avoidance of sensitive features, developments, public lands, and constructability issues (e.g., steep terrain, potholes, excessive bedrock, etc.), as discussed above. Based on the location of the collection points, crossing the Missouri River (Lake Sakakawea) was unavoidable. The selected crossing location of the Proposed Action avoids federally-owned lands to the extent practical, is at a narrow width of the river upstream of the wider Lake Sakakawea, and minimizes impacts on sensitive resources (e.g., piping plover critical habitat, eagle nests, etc.). The pipeline is 24 inches in diameter where it crosses approximately 14,942 feet (2.83 miles) of the Corps flowage easements at the Missouri River and is 30 inches in diameter where it crosses approximately 1,109 feet (0.21 mile) of the Corps-owned federal lands at Lake Oahe.

Within North Dakota, the proposed Supply pipeline crosses seven tracts of flowage easement retained by the Corps located north of the Missouri River in Williams County (**Figure 2)**. The proposed DAPL Project Mainline route travels through land owned and managed by the Corps on both sides of the Lake Oahe crossing at the border between Morton and Emmons counties (**Figure 3**). These lands, and the associated Project impact acreages, expressed as construction workspace, are identified in **Table 2-1** below.

Table 2-1 Flowage Easements and Federal Land Crossings		
Grant of Easement Document Number	**County**	**Construction Workspace Within Tract (acres)**
Flowage Easements		
LL3440E	Williams	9.4
LL3483E-1	Williams	10.8
LL3453E	Williams	10.7
LL3430E	Williams	5.0
LL3450E-2	Williams	5.2
LL3431E	Williams	14.7
LL3426E-2	Williams	3.4
Total Acres	**--**	**59.2**
Federally-Owned Lands		
Federal Land	Morton	0.4
Federal Land	Emmons	0.8
Total Acres	--	**1.2**

The EA review area includes areas within the Corps flowage easements and federal lands that are potentially impacted by construction and/or operation of the Project. The EA review area is hereafter referred to as the Project Area(s). Actions that occur outside of the flowage easements and the federal lands at the Lake Oahe crossing are considered Connected Actions. Connected Actions are those actions that are "closely related" and "should be discussed" in the same NEPA document (40 CFR § 1508.25 (a)(i)). Actions are connected if they automatically trigger other actions that may require an EA, cannot or will not proceed unless other actions are taken previously or simultaneously or if the actions are interdependent parts of a larger action and depend upon the large action for their justification (40 CFR § 1508.25 (a)(i, ii, iii)). Connected Actions are limited to actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not Connected Actions, but may need to be analyzed in the cumulative effects analysis if they are reasonably foreseeable. The only Connected Actions associated with the Proposed Action are those that relate to the HDD workspace at the Missouri River crossing and the HDD workspace, HDD stringing area, and the permanent easement on private lands in the vicinity of the Lake Oahe crossing.

Dakota Access initially proposed an isolation valve to be located within the flowage easements (easement LL3453E); however, the Omaha District has assessed the potential for open water and ice jam flooding within the vicinity of the Project Area in the "Reconnaissance Report, Missouri River, Buford-Trenton Irrigation District, North Dakota" and based on the findings the valve would be located within an area that has the potential to be submerged or damaged by ice jam flooding. Therefore, the valve has been removed from the Project Area.

Table 2-2 defines the components of both the Project Area and related Connected Actions.

Table 2-2 Environmental Assessment Areas of Interest			
Action/Activity	**Federal/ Private Land**	**EA Review**	**Acres**
Flowage Easements–-Williams County			
Construction ROW within Corps flowage easements	Private; Federal Easement	Project Area	58.0
HDD workspace (exit point) within Corps flowage easement	Private; Federal Easement	Project Area	1.2
Permanent easement over HDD profile within Corps flowage easement and placement of temporary waterline	Private; Federal Easement	Project Area	1.2
Flowage Easements Connected Actions – McKenzie County			
HDD workspace (entry point) on private land	**Private**	**Connected Action**	**2.0**
Federal Lands and Connected Actions - Morton County			
HDD workspace (exit point) on private land	Private	Connected Action	1.2
HDD stringing area on private land	Private	Connected Action	13.1
Permanent easement over HDD profile on private land between HDD workspace (exit point) and federal lands	Private	Connected Action	0.8
Permanent easement over HDD profile on federal lands	Federal	Project Area	0.4
Federal Lands and Connected Actions - Emmons County			
Permanent easement over HDD profile on federal land	Federal	Project Area	0.8
Permanent easement over HDD profile on private land between federal land and HDD workspace (entry point)	Private	Connected Action	0.3
HDD workspace (entry point) on private land	Private	Connected Action	1.2
Lake Oahe			
Permanent easement over HDD profile across Lake Oahe	N/A	Project Area	6.3

2.3.1.1 Flowage Easements

The Missouri River HDD is located just upstream of Lake Sakakawea and downstream of the confluence of the Yellowstone and Missouri rivers. The proposed crossing of flowage easements near upper Lake Sakakawea (flowage easements) is located in Sections 7, 18, 19, and 30, Township 152 North, Range 103 West, in Williams County, North Dakota (**Figure 2**). The proposed pipeline is routed parallel to an existing buried natural gas pipeline and associated valve sites, which cross the Missouri River and flowage easements just west of the proposed Dakota Access pipeline.

The HDD exit workspace would be located on a flowage easement tract. Access to the Project Area on the flowage easements would be via the construction ROW from an existing road (38th Street NW). No additional temporary access roads would be required. The Connected Action at the flowage easements includes the HDD entry workspace, located on the south side of the Missouri River on private lands in McKenzie County. Access to the HDD entry workspace will be via the existing access road located adjacent to the HDD entry workspace. No additional temporary access roads would be required.

2.3.1.2 Federal Lands

The proposed crossing of federally-owned tracts at Lake Oahe (federal lands) is located in Section 10, Township 134 North, Range 79 West in Morton County, North Dakota, and Section 11, Township 134 North, Range 79 West in Emmons County, North Dakota (**Figure 3**). The proposed pipeline is routed to parallel existing linear infrastructure (an overhead powerline and a buried natural gas pipeline) in this area. The HDD entry and exit point workspaces and stringing area would be located on private land outside of the federal lands and are considered Connected Actions in this analysis. HDD design reflects a crossing length of approximately 7,500 feet, of which approximately 5,420 feet occurs beneath the bed of Lake Oahe.

2.3.2 Description of Construction Techniques and Construction Mitigation Measures

All facilities associated with the Project would be designed, constructed, tested, operated, and maintained in accordance with the U.S. DOT regulations in Title 49 CFR Part 195. Dakota Access is currently developing Project-specific plans and would implement best management practices (BMPs) to mitigate for potential construction-related impacts associated with stormwater runoff. This includes implementation of their Stormwater Pollution Prevention Plan (SWPPP; see **Appendix A**), which includes the Spill Prevention Control and Countermeasure Plan (SPCC Plan) as an appendix. Additionally, Dakota Access would implement their HDD Construction Plan and HDD Contingency Plan (HDD Construction/Contingency Plan; see **Appendix B**) for inadvertent release of drilling mud during HDD construction work at wetland and waterbody crossings to protect sensitive resources from such releases. The Project would be constructed via a combination of conventional and specialized construction procedures, as described below.

2.3.2.1 Clearing and Grading

Prior to commencement of ground-disturbing activities, a standard survey and stakeout would be conducted to identify ROW and workspace boundaries and to locate existing foreign utility lines within the construction ROW. Following completion of the surveys, the construction ROW would be cleared of vegetation and debris. Clearing of wetlands is limited to removal of woody debris in the forested wetlands above the HDD profile on the north bank of the Missouri River within the flowage easements. Stumps would be cut flush with the ground and left in place, as described in Section 3.2.3. Cleared vegetation and debris along the ROW would be disposed of in accordance with federal, state, and local regulations either by burning, chipping and spreading, or transportation to a commercial disposal facility. Where necessary, to contain disturbed soils during clearing and grading in upland areas, and to minimize potential erosion and sedimentation of wetlands and waterbodies, temporary erosion control devices (ECDs) would be installed prior to initial ground disturbance and maintained throughout construction. Vegetative buffers would be left where practical at all waterbody crossings to limit the exposure and impact to these features. Final clearing would take place immediately prior to crossing the feature rather than advance.

2.3.2.2 Trenching

Trenching involves excavation of a ditch for pipeline placement and is accomplished through the use of a trenching machine, backhoe, or similar equipment. Trench spoil would be deposited adjacent to each trench within the construction work areas, with topsoil segregation utilized where necessary based on land use (see the typical ROW configuration drawings in **Appendix C**). In standard conditions, the trench would be excavated to an appropriate depth to allow for a minimum of 36 inches of cover over the pipe. Ground disturbance associated with conventional pipeline construction is generally limited to approximately 6 to 10 feet below the existing ground surface. Typically the bottom of the trench would be cut at least 12 inches greater than the width of the pipe. The width at the top of the trench would vary to allow the side slopes to adapt to local conditions at the time of construction.

2.3.2.3 Pipe Stringing, Bending, and Welding

Following preparation of the trench, the new pipe would be strung and distributed along the ROW parallel to the trench. Depending on available workspace, some pipe may be fabricated off-site and transported to the ROW in differing lengths or configurations. Pipe would be bent by hydraulic bending machines, as necessary, to conform the pipe to the trench. Once in place along the ROW, pipe lengths would be aligned, bends fabricated, and joints welded together on skids (i.e., temporary supports). Welding would be performed in accordance with the American Petroleum Institute Standards, Pipeline and Hazardous Materials Safety Administration (PHMSA) pipeline safety regulations, and company welding specifications. All welds would be coated for corrosion protection and visually and radiographically inspected to ensure there are no defects. Segments of completed pipeline would undergo hydrostatic pressure testing as described in Sections 3.2.1.2 and 3.11.

2.3.2.4 Pipeline Installation and Trench Backfilling

Completed sections of pipe would be lifted off the temporary supports by side boom tractors or similar equipment and placed into the trench. Prior to lowering-in, the trench would be visually inspected to ensure that it is free of rock and other debris that could damage the pipe or the coating. Additionally, the pipe and the trench would be inspected to ensure that the configurations are compatible. Tie-in welding and pipeline coating would occur within the trench to join the newly lowered-in section with the previously installed sections of pipe. Following this activity, the trench would be backfilled with the previously excavated material and crowned to approximately 6 inches above its original elevation to compensate for subsequent settling.

2.3.2.5 Clean-up and Restoration

Following pipeline installation and backfilling, disturbed areas would be restored and graded to pre-construction contours as closely as practicable. Construction debris and organic refuse unsuitable for distribution over the construction ROW would be disposed of at appropriate facilities in accordance with applicable regulations. Permanent ECDs would be installed as appropriate, and revegetation measures would be applied in accordance with the Environmental Construction Plan (ECP; see **Appendix G**), SWPPP, and requirements of applicable state and federal permits.

2.3.2.6 Major Waterbody Crossing Method

As previously discussed, the preferred waterbody crossing technique for the Proposed Action is the HDD method. The HDD method allows for construction across a feature without the excavation of a trench by drilling a hole significantly below conventional pipeline depth and pulling the pipeline through the pre-drilled hole. As described in subsequent sections of this document and in greater detail in the HDD Construction Plan (**Appendix B**), by utilizing the trenchless technology, Dakota Access would minimize impacts to resources within and adjacent to the waterbodies crossed and reduce the anticipated duration of the crossing. The HDD equipment would be staged well outside of the riparian area, avoiding impacts on the steep banks, cultural resources, and sensitive habitat immediately adjacent to the waterbody.

Depending on the HDD equipment utilized, to help guide the drill bit along the pipeline ROW, electric-grid guide wires may be laid along the predetermined HDD route. In thickly vegetated areas, a small path may be cut to accommodate laying the electric-grid guide wires. Once the electric-grid guide wires are installed, the directional drilling rig would drill a small diameter pilot hole along the prescribed profile. Following the completion of the pilot hole, reaming tools would be utilized to enlarge the hole to accommodate the pipeline diameter. The reaming tools would be attached to the drill string at the exit point and would then be rotated and drawn back to incrementally enlarge the pilot hole. During this process, drilling fluid consisting of primarily bentonite clay and water would be continuously pumped into the pilot hole to remove cuttings and maintain the integrity of the hole. When the hole has been sufficiently enlarged, a prefabricated segment of pipe would be attached behind the reaming tool on the exit side of the crossing and pulled back through the drill hole towards the drill rig.

Fluid pressures can build up within the borehole during HDD operations. In some instances, this can result in hydraulic fracturing of the substrate and subsequent migration of drilling fluids either into the waterway or to the land surface—this is known as a "frac-out." The depth of the proposed HDD profiles below the beds of the surface waters to be crossed would minimize the potential for frac-outs to occur. Additionally, precautions would be taken during all phases of the drilling operation. A high quality drilling fluid would be used to maintain and protect the integrity of the borehole during the entire HDD operation until the final pipe pull is completed. The HDD Construction Plan (**Appendix B**) includes more details regarding HDD construction technology and methods. The work would be performed by an experienced drilling contractor, Michels Directional Crossings, a Division of Michels Corporation, that is knowledgeable in effective HDD practices, including maintaining proper drilling rate, drilling fluid composition, pumping rate of the drilling fluid, pull-back rate, and pumping rate on the back ream, and adjusting these as appropriate for the conditions.

2.3.2.7 Minor Waterbody Crossing Methods

There are no minor waterbodies crossed by the pipeline on Corps Fee Lands. All minor waterbodies encountered on the flowage easements have been identified as falling under the jurisdiction of the Buford/Trenton Irrigation District (BTID) and, in compliance with their regulations, would be crossed via trenchless pipeline construction methods (bores). Dakota Access is working through the BTID permitting and approval process separately. One intermittent waterbody has been identified on the south side of the Missouri River crossing, within the connected action area but outside of the flowage easements, and within the HDD workspace. Temporary impacts to this waterbody would be mitigated during construction with a customized HDD equipment configuration, including the placement of temporary matting/bridging

over the feature as necessary to maintain natural water flow during construction, and installation of appropriate ECDs. Therefore, impacts on surface waters and adjacent sensitive habitat would be minimized by eliminating open-cut pipeline installations and in-stream work for all crossed waterbodies.

2.3.2.8 Wetland Crossings

As discussed in Section 3.2.3 below, the only wetlands that would be crossed by Project activities are located within the permanent easement between HDD workspace and the Missouri River on the flowage easements. As such, no wetlands would be impacted by construction or operation of the Project facilities within the Project Area/Connected Actions of the federal lands, and no trenching within wetlands would occur within the Project Area on the flowage easements. A temporary waterline would be laid aboveground, across the wetlands located between the HDD workspace and the north bank of the Missouri River on flowage easement LL3440E (**Figure 6-B**). No ground disturbing activity would be required for installation of the temporary waterline. A more detailed discussion regarding wetlands is provided in Section 3.2.3.

2.3.2.9 Operation and Maintenance

Following completion of construction, a 50-foot-wide permanent easement along the entire Project alignment that is generally centered on the pipeline (25 feet on either side of the centerline) would be retained along the pipeline route. The 50-foot-wide easement would be maintained by the Operator in an herbaceous state (cleared of large diameter woody vegetation) to facilitate inspection of the pipeline, operational maintenance, and compliance with the federal pipeline safety regulations. This 50-foot-wide maintained corridor would be reduced to a 30-foot-wide corridor centered on the proposed pipeline within the wetland area north of the Missouri River in Corps Flowage Easement LL3440E (**Figure 6-B**).

Maintenance of the permanent ROW would entail periodic vegetation clearing measures, in accordance with PHMSA regulation for pipeline inspection. This may involve selective tree cutting and periodic mowing. The use of herbicides would not occur on Corps Fee Lands without obtaining prior approval from the Corps. Vegetation maintenance of the ROW in areas of active cropland is not expected to occur due to agricultural practices.

3.0 THE AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVE

3.1 Geology and Soils

Under the "no action" alternative, Dakota Access would not construct the proposed Project and no impacts on geology and soils would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on geology and soils, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only minor and temporary impacts, if any, on geological resources and soils would occur as a result of the Proposed Action, as described in the sections below.

3.1.1 Geology

3.1.1.1 Affected Environment

The Corps flowage easements to be crossed extend approximately 2.83 miles north of the Missouri River in Williams County (**Figure 2**). Conventional open trench construction methods would be used to install the pipeline on approximately 13,553 feet of the 14,953 feet of flowage easements. The remaining 1,400 feet would be installed via HDD for the adjacent Missouri River crossing. The easements and Connected Action (and the river) lie within the Missouri River valley and floodplain on top of the Quaternary Oahe Formation (Clayton, 1980). The Oahe Formation is comprised of unconsolidated sediments, including clay, sand, silt, and gravel, with some dispersed organic material. Geotechnical borings placed on both sides of the river, ranging in depth from 75 to 95 feet below ground surface, confirm the presence of unconsolidated sand, gravel, and clay to at least these depths. At this location, the Oahe Formation unconformably overlies the Paleocene Bullion Creek Formation, which is made up of silt, sand, clay, sandstone, and lignite, and is the uppermost part of a thick sequence of early Tertiary and late Mesozoic sedimentary formations. Well borehole data from McKenzie County indicates that this sequence occurs in excess of 15,000 feet thick in certain locations (Freers, 1970).

The flowage easements crossed by the Proposed Action and area crossed by the Connected Action occur within the Great Plains Physiographic Province, which is characterized by a broad expanse of flat land in the central portion of the U.S. The easements and the Missouri River Project Area lie within an area where physiography is characterized by low-relief alluvial and floodplain deposits and range in elevation from 1,856 to 1,879 feet above mean sea level (MSL).

The bedrock geology of the Lake Oahe crossing area is characterized by Cretaceous sedimentary formations (Clayton, 1980). The Fox Hills Formation (sandstone and shale) overlies the Pierre Formation (shale), which has been exposed through erosion along the axis of the Lake Oahe reservoir of the Missouri River. The surficial geology is characterized by alluvium within the valley and dune deposits moving in an eastward direction. This was corroborated by geotechnical soil borings that were placed on private lands on both sides of Lake Oahe that indicate the presence of sands and clays to depths ranging from at least 150 to 235 feet below ground surface (**Appendix D**).

The Lake Oahe crossing area also lies within the Great Plains Physiographic Province. On the west side of Lake Oahe, the federal land tracts range in elevation from 1,609 to 1,712 feet above MSL. The HDD exit point workspace ranges from 1,699 to 1,711 feet MSL, and the stringing area ranges from 1,671 to 1,766 feet MSL. On the east side of Lake Oahe, the federal lands range in elevation from 1,613 to 1,664 feet MSL, and the HDD entry point workspace ranges from 1,636 to 1,644 feet MSL.

3.1.1.2 Impacts and Mitigation

To protect the terrain of the Project Area and Connected Actions, Dakota Access would, to the extent feasible, restore the areas affected by pipeline construction to pre-construction contours and similar vegetation (excepting trees within approximately 15 feet of the centerline). Pre-construction and as-built surveys would be completed and provided to the Garrison Project.

Construction of the pipeline on the flowage easements and Connected Action at the Missouri River crossing would result in minor impacts on topography and geology, and no unique geologic features that have received state or federal protection would be impacted within the Corps flowage easements or Connected Action. The impacts attributable to the HDD would not be significant. Primary impacts of open trench installation within the Corps flowage easements or Connected Action would be limited to construction activities and consist of temporary alteration due to grading and trenching operations.

Construction of the pipeline at the Lake Oahe crossing would not result in adverse impacts on topography or geology on federal lands of the Project Area. Similarly, construction impacts on topography and geology from the Connected Actions would be low to non-existent. No unique geologic features would be impacted by any aspect of the HDD installation.

No impacts on topography or geology would occur during operations.

Based on recently obtained geotechnical analysis, no blasting would be expected to occur in association with pipeline installation on the Project Area or Connected Actions, given that the HDD would be conducted in unconsolidated or loosely indurated sediments, as described in Section 3.1.1.1. Although not anticipated, if blasting is found to be necessary, Dakota Access would follow procedures specified in its Blasting Plan (**Appendix E**).

3.1.2 Mineral Resources

3.1.2.1 Affected Environment

Williams and McKenize counties have numerous mineral resources that include petroleum, lignite, halite, sand and gravel, and scoria. Scoria, sediments baked from the in situ combustion of lignite (Carlson, 1985), is commonly used to surface roads. Although lignite occurs throughout Williams and McKenzie Counties, there are no lignite beds in the vicinity of the Corps flowage easement crossings (Murphy, 2006; 2007). A review of aerial photographic and USGS 1:24K topographic coverage indicates that there are no sand, gravel, or scoria pits within 1.5 miles of the Corps flowage easement crossing areas.

Two oil/gas wells are located within the Corps flowage easements (LL3440E), but neither occur within 150 feet of the proposed HDD workspace. In addition, no oil/gas wells are located within 150 feet of the Connected Action at the Missouri River (North Dakota Department of Mineral Resources, 2015).

The primary mineral resources of Morton and Emmons counties are sand and gravel aggregates. The older Cretaceous sediments in the vicinity of the Lake Oahe crossing (i.e., scoria) do not contain economical deposits of fossil fuels. Although lignite occurs in Morton County, no lignite beds were identified in the vicinity of the Lake Oahe crossing. A review of aerial photographic and USGS 1:24K topographic coverage indicates that there are no sand, gravel, or scoria pits within 1.5 miles of the Lake Oahe crossing.

Since Morton and Emmons Counties are located outside the areal extent of the Bakken Formation, there is little to no development of oil/gas resources. This is reflected in the fact that no oil/gas wells were located within 150 feet of the federal lands or HDD workspace and stringing area. However, the proposed pipeline would be co-located with an existing buried natural gas pipeline and an overhead electric transmission line across the lake.

3.1.2.2 Impacts and Mitigation

As noted previously, mineral resources, including lignite, halite, sand and gravel, and scoria occur within the region around the Corps flowage easements and Connected Action; however, the only commercially exploited mineral resources in the direct vicinity of the route are oil and gas, as evidenced by the two wells found within the Corps flowage easements. These wells would not be impacted by the Proposed Action due to proposed conventional construction methods and distance from the wells. No impacts on any mineral resources are expected as a result of the proposed flowage easement crossings or Connected Action.

The Proposed Action does not cross active mining areas nor any oil or gas wells and facilities in the vicinity of Lake Oahe. No impacts to any mineral resources are expected as a result of the proposed Lake Oahe crossing.

Dakota Access, in accordance with North Dakota One Call, would require that the construction contractor, prior to initiating any ground disturbance activities, identify all underground utilities to minimize the potential for encountering buried utility structures. Accordingly, the Proposed Action is not expected to have any impact on mineral resources, because there would be no additional surface disturbance required beyond that used for construction.

3.1.3 Geologic Hazards

3.1.3.1 Affected Environment

Earthquakes and Seismic Hazards

The Project route in North Dakota, including the Proposed Action areas, traverses terrain that overall is geologically stable. The potential seismic hazard was assessed by evaluating the USGS 2014 Seismic Hazard Map. According to the Seismic Hazard Map, an earthquake that has a 2% chance of being

exceeded in a 50-year period would result in peak ground accelerations (PGAs) of 2 to 4 percent gravity (g) in the Project Area and Connected Actions (USGS, 2014a).

Ground movement from an earthquake of this magnitude may cause a light perceived shaking but is not expected to cause any structural damage. The low seismic hazard of the Project Area is further corroborated by the relatively low number of earthquakes that have historically occurred in North Dakota (North Dakota GIS Hub Data Portal, 2010).

Landslides

Landslides refer to the gravity-induced downward and outward movement of slope-forming materials and pose the greatest risk to facilities on or near steep slopes or on soil materials that are susceptible to failure particularly in response to earthquakes or heavy precipitation. A map developed by the USGS that illustrates the regional potential for the occurrence of landslides was used to evaluate the Project Areas for landslide incidence and susceptibility (Radbruch et al., 1982).

Portions of the Project Area within the Corps flowage easements are moderately susceptible to landslides. This includes 59.2 acres (100%) of construction workspace, of which 17.0 acres lies within the 50-foot-wide permanent easement, and 0.55 acre occurs within the 30-foot-wide maintained corridor above the HDD profile within the Corps flowage easement (which would not have surface disturbance aside from selective tree cutting and roots would remain in place). The HDD entry point on the south side of the Missouri River outside of the flowage easements is considered the Connected Action. The HDD entry workspace is approximately 2.0 acres and is also moderately susceptible to landslides.

As designed, the Project does not require any surface impacts to the federally owned lands at Lake Oahe, although , 0.4 acre of the permanent easement through the federal property on the west side of the Lake Oahe (Morton County) is classified as having a high incidence of landslides. Slopes greater than 25% in the Project Area within federal lands are not found on the east side of Lake Oahe (Emmons County) and comprise less than 0.02 acre on the west side. Activities related to the HDD crossing outside of the federal lands at the Lake Oahe crossing are considered Connected Actions. On the west side of Lake Oahe, 1.2 acres of the HDD workspace (exit point) and 13.1 acres of the pipe stringing area are designated as having a high incidence for landslides. Additionally, the stringing area encompasses approximately 1.8 acres of land that is classified as highly susceptible to landslides. Approximately 0.9 acre within the stringing area has slopes exceeding 25%. Approximately 1.2 acres of the HDD entry point workspace on the east side of Lake Oahe is designated as having a high incidence of landslides, but there are no slopes within either the east or west HDD workspace that exceed 25%.

Karst and Subsidence

Geologic terrane beneath the flowage easements as well as the Connected Actions has potential for karst development owing to the presence of evaporite deposits, consisting of gypsum, salt, anhydrite, and/or potash (Weary and Doctor, 2014). These deposits range in age from Devonian to Jurassic and occur at depths ranging from 900 to 3,700 meters (3,000 to 12,000 feet). Fresh water must be present for the necessary dissolution to occur for karst development. However, since fresh water is not likely to be found at these depths, dissolution and karst development are not likely to occur (Ackerman, 1980). Even if karst

conditions were to develop, any physiographic expression at the ground surface would be negligible given the great depth of these formations.

Geologic terrane beneath the federal lands crossings as well as the HDD workspaces at Lake Oahe area may have potential for karst development due to deposits of gypsum and other evaporates (Weary and Doctor, 2014). However, a review of topographic and aerial photographic coverages as well as geotechnical testing gave no indication of karst feature development, and no documentation was found to indicate that karst features have actually developed in this area. Furthermore, an existing buried pipeline and overhead electric transmission line also cross in this location, and no information was found indicating those utilities have been impacted by karst.

Land subsidence may be caused by mining, underlying karst features, and extraction of fluids, such as oil or groundwater. No surface subsidence effects are expected to be incurred in the Project Area since no mines, oil/gas wells, water wells, or karst development have been identified in the Project vicinity. Moreover, despite the fact that oil and gas production has occurred for decades in the Williston Basin, no surface subsidence effects have been documented in that area and, therefore, are not expected to impact the Project Areas within or near the margin of the Williston Basin.

3.1.3.2 Impacts and Mitigation

Although landslides can represent a significant geologic hazard during construction and operation of the pipeline, the pipeline would be installed via the HDD to significantly reduce ground disturbing activities in areas with steep slopes (greater than 25%), effectively mitigating the risk.

As previously discussed, no ground disturbing activities would occur within the Project Area on the federal lands. Ground disturbing activities associated with the HDD workspace and pipe stringing area would be required as part of the Connected Action; however, these activities would consist of clearing and grading only and would occur, at the closest distance, 1,040 feet from the bank of Lake Oahe. As such, no trenching or excavation activities would occur within the Project Area or Connected Action of the federal lands, thereby reducing the potential for erosion and off-site sedimentation which could otherwise occur as a result of side-slope trench excavation methods and accumulation of water within the trench.

To further mitigation impacts during construction, Dakota Access would utilize erosion and sediment control devices in accordance with the ECP and SWPPP, and in compliance with the National Pollutant Discharge Elimination System (NPDES) program, during construction in these areas with slopes greater than 25%. Dakota Access would install sediment barriers (e.g., silt fence) at the base of slopes and along the sides of slopes, as necessary, to prevent potential siltation downslope of the construction area from entering waterbodies.

Temporary erosion control devices (ECDs) would be maintained until the areas disturbed by construction have been successfully revegetated or are replaced with permanent ECDs. Following the completion of construction activities, disturbed areas would be restored and graded to pre-construction contours as closely as practical. In order to minimize the potential for future slip or landslide events during operation of the Project facilities, Dakota Access may install permanent ECDs in addition to performing regular restoration and revegetation activities. Permanent ECDs would be installed in accordance with revegetation measures outlined in the ECP, SWPPP, and specific landowner requests. The effectiveness of

revegetation and permanent ECDs would be monitored by Dakota Access' operating personnel during the long-term operation and maintenance of the Project facilities. Therefore, construction and operation of the Project facilities on the Project Area and Connected Action of the federal lands would not be expected to increase the potential for significant landslide or slip events or result in adverse impacts on aquatic life resources within Lake Oahe.

Dakota Access has completed a geotechnical analysis of the flowage easement and federal land crossing sites to facilitate engineering and design, including selection of appropriate materials and construction methods to limit any environmental impacts attributable to landslides. Results of the geotechnical analysis are included in **Appendix D**.

The strength and ductility of a properly designed pipeline would allow it to span a considerable distance without compromising its integrity in the event of a landslide or other ground movement, such as subsidence. Arc-welded steel pipelines are the most resistant type of piping, vulnerable only to very large and abrupt ground displacement (e.g., earthquakes, severe landslides) and are generally highly resistant to moderate amounts of permanent deformation. This strength and ductility effectively mitigates the effects of fault movement, landslides, and subsidence. Therefore, by implementing the mitigation measures presented here, impacts on the pipeline from geologic hazards are expected to be minimal.

No impacts associated with seismic activity within the Project Area are anticipated. Due to the limited potential for large, seismically induced ground movements, there is minimal risk of earthquake-related impacts on the pipeline. Therefore, no mitigation beyond designing the proposed pipeline to currently accepted industry specifications is necessary.

3.1.4 Paleontology

3.1.4.1 Affected Environment

The surficial geology at the Missouri River crossing is dominated by Quaternary glacial drift materials within the floodplain overlying the Bullion Creek and Sentinel Butte Formations. These bedrock formations have been known to contain wide variety of fossils, including fossilized wood and tree stumps, mollusks, leaves, and insects (Hoganson and Campbell, 2002). Additionally, vertebrate fossils have been found, including turtles, crocodile-like champosaurs, and bear-like titanoides.

The surficial geology at the Lake Oahe crossing is also characterized by Quaternary glacial drift materials; however, it is underlain by the Fox Hills and Pierre Formations. These formations could contain diverse fossils, including marine reptiles (e.g., mosasaurs, plesiosaurs, sea turtles), fish (e.g., sharks and rays), birds, and invertebrates (Hoganson, 2006).

While there is potential for the bedrock formations underlying the Missouri River and Lake Oahe crossings to contain fossils, all activities, including HDDs, would only penetrate the surficial geology that is dominated by unconsolidated sediments, as evidenced in the geotechnical report provided in **Appendix D**. The potential for encountering fossils in these unconsolidated sediments at the Missouri River and Lake Oahe crossings is low, as fossils are primarily found in sedimentary rock.

3.1.4.2 Impacts and Mitigation

Activities associated with pipeline construction that have the potential to impact paleontological resources are clearing, grading, and trenching, as well as site preparation for HDD operations. The paleontological resources of concern pertaining to construction of the Project are vertebrate fossils that may be present in the Paleocene bedrock sediments, and to a lesser degree, in Quaternary alluvium since this type of deposit only rarely contains vertebrate fossils.

In the event paleontological resources are discovered during construction, Dakota Access would implement measures outlined in its Unanticipated Discoveries Plan Cultural Resources, Human Remains, Paleontological Resources and Contaminated Media (UDP) (**Appendix F**) to avoid further impacts on these resources.

Invertebrate fossils are considered to be insignificant, and mitigative measures would not be required, should they be encountered. However, if any vertebrate fossils are found during pipeline construction, Dakota Access would immediately cease construction activities and notify appropriate agency personnel, including the North Dakota state paleontologist as well as the Corps archaeologist. The appropriate authorities would determine the significance of the find and prescribe the mitigation procedures to be completed prior to resuming pipeline construction.

Operation of the pipeline would not disturb paleontological resources.

3.1.5 Soils

3.1.5.1 Affected Environment

Dakota Access identified and assessed soil characteristics in the Project Area and Connected Actions using the Soil Survey Geographic Database, which is a digital version of the original county soil surveys developed by the NRCS for use with GIS (NRCS, 2015). The areas are located within the Rolling Soft Shale Plain of North Dakota, South Dakota, and Montana. The dominant soil orders in the Rolling Soft Shale Plain are Mollisols and Entisols, which are shallow to very deep, generally somewhat excessively drained and loamy or clayey (NRCS, 2006).

The flowage easements and Connected Action are within Zone A of the Missouri River floodplain. Soils within the Project Area are formed out of alluvium deposited by the river over time. Slopes throughout this Project Area are very flat, ranging from 0-2%. Approximately 94% of the flowage easement Project Area and Connected Action would be located within either Scorio silty clay or Lohler silty clay (**Table 3-1, Figure 4**). The Scorio and Lohler silty clay soils are moderately well drained and formed in clayey alluvium. In the case of the Scorio silty clay, the clay alluvium is deposited over a loam alluvium. The Scorio and Lohler soils are identified as Hydrologic Soil Group C, which have slow infiltration rates when thoroughly wet and a slow rate of water transmission. The average depth to the water table across the majority of this Project Area is 4.25 feet. The soils within the flowage easements experience occasional flooding but are not generally ponded. Soil boring data is provided in (**Appendix D**).

Table 3-1
Soil Types Mapped on the Flowage Easements Project Area and Connected Action

Soil Map Unit	Soil Map Unit Name	Project Area (acres) [1]	Farmland Rating	Hydrologic Group [2] (infiltration)	Hydric Rating [3]	Wind Erodibility Group [4]
E4039A	Mckeen loam, 0-1% slopes, frequently flooded	0.1	None	B/D	96%	4L
E4051A	Trembles fine sandy loam, slightly wet, 0-1% slopes, occasionally flooded	0.5	Farmland of Statewide Importance	A	0%	3
E4103A	Lohler silty clay, saline, 0-1% slopes, occasionally flooded	0.9	None	C	0%	4
E4106A	Lohler silty clay, slightly wet, 0-2% slopes, occasionally flooded	27.8	Farmland of Statewide Importance	C	5%	4
E4159A	Scorio silty clay, slightly wet, 0-2% slopes, occasionally flooded	29.9	Farmland of Statewide Importance	C	0%	4
E2725F	Arikara-Shambo-Cabba loams, 9-70% slopes	2.0	None	B	0%	6
EW	Water	0.3	None	N/A	N/A	N/A
	Total	**61.5**	--			

[1] The Project Area includes the construction workspace (58.0 acres) and 30-foot maintenance easement (1.0 acre) located on the flowage easements as well as the Connected Action workspace (2.0 acres).
[2] Hydrologic Soil Groups are used to estimate runoff from precipitation: A = high infiltration rate, low runoff potential; B = moderate infiltration rate; C = slow infiltration rate; D = very slow infiltration rate, high runoff potential.
[3] Hydric Rating: Hydric (100%), Hydric (66-99%), Hydric (33-65%), Hydric (1-32%), Not Hydric (0%).
[4] Wind erodibility group in cultivated areas: Group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. 4L indicates calcareous soils.

The predominant soil type at the federal lands at Lake Oahe is the Flasher-Vebar-Parshall complex. This complex would comprise 7.5 acres (34%) of the Project Area and Connected Action (**Table 3-2, Figure 5**). The Flasher-Vebar-Parshall complex contains 36% Flasher or similar soils, 22% Vebar or similar soils, 15% Parshall or similar soils, and 27% minor components. The Flasher-Vebar-Parshall complex is formed from sandy residuum weathered from sandstone and is steep within the Project Area and Connected Action, with slopes ranging from 9 to 35% (NRCS, 2015). The Flasher-Vebar-Parshall complex is Hydrologic Soil Group D, which has very slow infiltration (high runoff potential) when thoroughly wet. The depth to the water table is greater than 6.5 feet. A majority of the soils within the Project Area and Connected Action are neither frequently flooded nor frequently ponded.

Table 3-2 Soil Types Mapped on the Federal Lands Project Area and Connected Action						
Soil Map Unit	**Soil Map Unit Name**	**Project Area (acres) [1]**	**Farmland Rating**	**Hydrologic Group [2] (infiltration)**	**Hydric Rating [3]**	**Wind Erodibility Group [4]**
E0623B	Grail-Belfield clay loams, 2-6% slopes	2.9	Farmland of Statewide Importance	C	0%	6
E0701F	Dogtooth-Janesburg-Cabba complex, 6-35% slopes	0.8	None	D	3%	6
E1423F	Flasher-Vebar-Parshall complex, 9-35% slopes	5.8	None	D	0%	2
E1823A	Parshall fine sandy loam, 0-2% slopes	0.7	Farmland of Statewide Importance	A	0%	3
E2601C	Amor-Cabba loams, 6-9% slopes	0.3	None	C	0%	6
E2803B	Amor-Shambo loams, 3-6% slopes	2.0	Farmland of Statewide Importance	C	0%	6
E3802B	Linton-Mandan silt loams, 2-6% slopes	2.6	Farmland of Statewide Importance	B	0%	5
E3813A	Grassna silt loam, loess, 1-2% slopes	1.7	Prime Farmland	B	2%	6
E3813B	Grassna silt loam, loess, 2-6% slopes	0.5	Prime Farmland	B	2%	6
E4139A	Korchea-Fluvaquents complex, channeled, 0-2% slopes, frequently flooded	0.4	None	B	43%	4L
EW /E49999	Water	6.4	None	N/A	N/A	N/A
	Total	**24.1**	**--**			

[1] The Project Area includes Connected Action areas.
[2] Hydrologic Soil Groups are used to estimate runoff from precipitation: A = high infiltration rate, low runoff potential; B = moderate infiltration rate; C = slow infiltration rate; D = very slow infiltration rate, high runoff potential.
[3] Hydric Rating: Hydric (100%), Hydric (66-99%), Hydric (33-65%), Hydric (1-32%), Not Hydric (0%).
[4] Wind erodibility group in cultivated areas: Group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. 4L indicates calcareous soils.

Prime Farmland

Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Other soils that do not meet the criteria for prime farmland may be considered farmland of statewide importance. These soils may produce high yields of crops when managed appropriately (NRCS, 2013). Climate is the primary limiting

factor preventing farmland of statewide importance in North Dakota from being considered prime farmland; therefore, specific management techniques or other soil amendments cannot elevate farmland of statewide importance to a prime farmland designation (Sieler, 2015).

Within the flowage easements and Connected Action, 95% of soils are considered farmland of statewide importance, and none of the soils are considered prime farmland. Approximately 9.5% of the soils on the federal lands, consisting only of Grassna silt loams, are considered prime farmland. Additionally, Linton-Mandan silt loam and Armo-Sambo loam, which comprise 25% of the soils on federal lands are designated as farmland of statewide importance. The remaining soils do not have a farmland designation.

3.1.5.2 Impacts and Mitigation

Pipeline construction activities such as clearing, grading, trench excavation, and backfilling, as well as the movement of construction equipment along the ROW may result in impacts on soil resources. Clearing removes protective cover and exposes soil to the effects of wind and precipitation, which may increase the potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may compact soil, reducing porosity and percolation rates, which could result in increased runoff potential and decreased soil productivity. Trench excavation and backfilling could lead to a mixing of topsoil and subsoil and may introduce rocks to the soil surface from deeper soil horizons.

Dakota Access would minimize or avoid these impacts on soils by implementing the mitigation measures described in the DAPL Project's SPCC, SWPPP, and ECP as well as requirements of applicable state and federal permits. These documents would be included as contract documents and enforced as such throughout the DAPL Project. As a result, impacts on soils as a result of the Project are expected to be insignificant.

Temporary erosion and sedimentation control measures may include installation of silt fence, straw bales, slope breakers, trench breakers, erosion control fabric, and mulch.

To minimize potential impacts on soil productivity, topsoil would be separated during trench excavation in agricultural land, and if applicable, other areas where soil productivity is an important consideration. Unless otherwise requested by the landowner, topsoil in cropland would be removed to a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil. After the trench is backfilled, topsoil would be returned to its approximate original location in the soil horizon.

Compaction of agricultural soils would be minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of compaction occur in agricultural lands, a chisel plow or other deep tillage equipment would be utilized to loosen the soil.

Dakota Access would retain environmental inspectors (EIs) to monitor the contractor's compliance with applicable requirements to protect soil resources during construction of the DAPL Project. The Garrison Project would be notified if the EIs document non-compliant activities by the contractor(s) on the Project Area or Connected Action Areas.

Soils would be temporarily disturbed within HDD workspaces during construction at the Missouri River and Lake Oahe crossings. Primary impacts attributable through open trench installation within the Corps flowage easements and Connected Action would be limited to construction activities and consist of temporary alteration of the construction ROW due to grading and trenching operations. **Tables 3-3** and **3-4** present the soil types that would be impacted by construction and maintenance activities. By implementing BMPs and recognized construction methods identified in the Project ECP (**Appendix G**), impacts to soils should be limited.

Additionally, temporary workspace used for staging HDD operations would impact soils, particularly in association with the HDD entry excavation pit (approximately 5 feet to 15 feet across). The pits would contain the drilling fluid that would be circulated through the borehole during drilling operations and the cuttings that are removed from the borehole. All drilling mud and cuttings would be disposed at an approved location on non-federal lands, which may include land farming on private property or disposal at a licensed disposal facility. Drilling fluid pits at the HDD entry and exit workspaces would be backfilled and the area returned as closely as practical to pre-construction conditions. Dakota Access would implement the erosion control measures described in the SWPPP (**Appendix A**). The HDD workspace sites would be cleared, graded and matted as needed to avoid rutting and minimize compaction.

There would be no soil disturbance outside of the construction workspace. Permanent impacts on soils would be avoided through the implementation of BMPs during construction, restoration, and post-construction revegetation management. A more complete description of BMPs and recognized construction methods can be found in the ECP (**Appendix G**).

There would be no conversion of prime farmland soils to non-agricultural use.

Table 3-3
Soil Impacts on the Flowage Easements Project Area and Connected Action

Soil Map Unit	Map Unit Name	Project Area Temporary Impacts (acres)	Connected Action Temporary Impacts (acres)	Permanent Impacts (acres)
E4039A	McKeen loam, 0-1% slopes, frequently flooded	0.1	0	0
E4051A	Trembles fine sandy loam, slightly wet, 0-1% slopes, occasionally flooded	0.5	0	0
E4103A	Lohler silty clay, saline, 0-1% slopes, occasionally flooded	0.9	0	0
E4106A	Lohler silty clay, slightly wet, 0-2% slopes, occasionally flooded	27.8	0	0
E4159A	Scorio silty clay, slightly wet, 0-2% slopes, occasionally flooded	29.9	0	0
E2725F	Arikara-Shambo-Cabba loams, 9-70% slopes	0	2.0	0
	Total	**59.3**	**2.0**	**0**

Table 3-4 Soil Impacts on the Federal Lands Project Area and Connected Action				
Soil Map Unit	**Map Unit Name**	**Project Area Temporary Impacts (acres)**	**Connected Action Temporary Impacts (acres)**	**Total Impact Acres[1]**
E0623B	Grail-Belfield clay loams, 2-6% slopes	0	2.9	2.9
E0701F	Dogtooth-Janesburg-Cabba complex, 6-35% slopes	0	0.8	0.8
E1423F	Flasher-Vebar-Parshall complex, 9-35% slopes	0.4	5.4	5.8
E1823A	Parshall fine sandy loam, 0-2% slopes	0	0.7	0.7
E2601C	Amor-Cabba loams, 6-9% slopes	0	0.3	0.3
E2803B	Amor-Shambo loams, 3-6% slopes	0	2.0	2.0
E3802B	Linton-Mandan silt loams, 2-6% slopes	0	2.6	2.6
E3813A	Grassna silt loam, loess, 1-2% slopes	0.7	1.0	1.7
E3813B	Grassna silt loam, loess, 2-6% slopes	0	0.5	0.5
E4139A	Korchea-Fluvaquents complex, channeled, 0-2% slopes, frequently flooded	0	0.4	0.4
EW	Water	0.1	0	0.1
	Total	**1.2**	**16.6**	**17.8**

[1] All soil impacts on Federal Lands and Connected Action at Lake Oahe are considered to be temporary.

3.2 Water Resources

Under the "no action" alternative, Dakota Access would not construct the proposed Project, and no impacts on water resources would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on water resources, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts or insignificant permanent impacts on water resources would occur as a result of the Proposed Action, as described in the sections below.

3.2.1 Surface Waters

3.2.1.1 Affected Environment

The Missouri River is a large perennial river and forms the border between Williams and McKenzie counties. The flowage easements are located on the north side of Lake Sakakawea in the Lake Sakakawea sub-basin (HUC 11010101) within the Upper Missouri River Basin. All drainage patterns from the flowage easements flow east and south towards and into the Missouri River/Lake Sakakawea ending at the Garrison Dam. Once released from the dam, water flows south into the Missouri River (NRCS, 2008).

Lake Oahe is a large reservoir formed behind the Oahe Dam on the Missouri River. Lake Oahe forms the border between Morton and Emmons counties. The Project Area is located in the Upper Lake Oahe

Watershed (HUC 10130102) within the Missouri River Basin and adjoins both sides of Lake Oahe at the crossing.

The Oahe Dam/Lake Oahe project is part of the chain of Missouri River main stem lakes authorized in the Flood Control Act of 1944. The Oahe Dam is located 6 miles north of Pierre, South Dakota and was placed into operation in 1962. The dam and associated reservoir (Lake Oahe) are congressionally authorized to provide flood control, hydroelectric power, navigation, irrigation, fish and wildlife enhancement, municipal water supply, water quality, and recreational opportunities to the residents of both South Dakota and North Dakota. At maximum normal operating pool level (1,617 feet MSL), Lake Oahe extends roughly 231 miles from the Oahe Dam in South Dakota to near Bismarck, North Dakota. At this level, the lake covers approximately 360,000 acres. At elevation 1,607.5 feet MSL base flood control elevation, the lake has over 2,250 miles of shoreline.

Lake Oahe can be divided into three segments based on the character of the lake. The proposed Project is located within the northern segment. The northern segment extends north from the North Dakota/South Dakota state line to the upstream Oahe Dam/Lake Oahe project boundary near Bismarck, North Dakota. This segment is more river-like in appearance and is characterized by both submerged and emergent snags, sandbars, many shallow areas, and a definite current (USACE, 2010a).

Dakota Access conducted field and desktop delineations of the Project Area/Connected Action on the flowage easements and the Project Area/Connected Action of the federal lands. Field surveys took place upon permission to access the properties in order to verify desktop delineations and ensure that the most accurate, up-to-date data is used for Section 404 of the CWA and/or Section 10 of the RHA permit filings. There are four waterbodies (one perennial stream and three ephemeral ditches) within the Project area on the flowage easements and one intermittent waterbody within the Connected Action Project area **(Figure 6)**. The Project Area and Connected Action of the federal lands encompass two waterbodies (one lake [Lake Oahe] and one ephemeral stream) **(Figure 7)**. Waterbody ID, type and approximate mileposts are summarized in **Table 3-5** and **Table 3-6**.

3.2.1.2 Impacts and Mitigation

Impacts on Lake Oahe and the Missouri River would be minimized by using HDD construction methods to install the proposed pipeline underneath the Missouri River and Lake Oahe. At the Missouri River crossing, a 24-inch pipeline would be installed a minimum of 60 feet below the bottom of the Missouri River. At Lake Oahe, a 30-inch pipeline would be installed approximately 140 to 210 feet below the ground surface of federal lands and approximately 92 feet below the bottom of Lake Oahe (**Appendix H**).

The primary impact that could occur as a result of an HDD is an inadvertent release of drilling fluid directly or indirectly into the waterbody. Drilling fluid (also referred to as drilling mud) is primarily comprised of water. However, bentonite clay is added to the water to enhance lubricating, spoil transport and caking properties of the drilling fluid. Bentonite is a naturally occurring, non-toxic, inert substance that meets National Science Foundation (NSF)/American National Standards Institute (ANSI) Standard 60 Drinking Water Additives Standards and is frequently used for drilling potable water wells. The potential exists for drilling fluid to leak through previously unidentified fractures in the material underlying the river bed. Potential release sources of the drilling fluid include the drilling fluid entry/exit pit(s) and the directional borehole itself, which is maintained under pressure to keep it open. The probability of an inadvertent

release is greatest when the drill bit is working near the surface (i.e., near the entry and exit points). To alleviate this concern, the HDD Contractor plans to install steel surface casing at both the entry and exit locations of the Lake Oahe crossing. Because the HDD entry and exit points would be set back from the banks of the Missouri River (approximately 1,400 feet north and 300 feet south) and Lake Oahe (approximately 900 feet east and 1,100 feet west) the potential for an inadvertent release to occur in the water would be minimized. Additionally, geotechnical investigations conducted by Dakota Access indicated that the drill path is not located in materials that suggest a high probability of an inadvertent release of drilling fluids that would reach ground surface or enter Lake Oahe. Therefore, the potential for inadvertently released drilling fluids to enter any waterbody from below or from the shoreline is low.

The drilling mud and cuttings would be disposed of in accordance with applicable laws and regulations, likely in an existing landfill or by land farming. Final disposition would be negotiated with the facility or private landowner prior to disposal. Dakota Access would conduct all HDD work according to the HDD Construction Plan (**Appendix B**), and implement the HDD Contingency Plan (**Appendix B**) in the event of an inadvertent release. The HDD Construction Plan establishes a 24-hour a day monitoring program for monitoring and detection of inadvertent releases, including monitoring for loss of drilling fluids. The HDD Contingency Plan describes monitoring and mitigation procedures for any inadvertent release of drilling mud into the waterbody or areas adjacent to the waterbody and includes procedures to contain and clean up inadvertent releases.

Dakota Access plans to hydrostatically test the HDD pipeline segments prior to installation at the Lake Oahe and Missouri River crossings. Hydrostatic testing involves filling the new pipeline segments with water acquired in accordance with applicable permits, raising the internal pressure level, and holding that pressure for a specific period of time per U.S. DOT requirements.

Dakota Access is requesting permission to withdraw water from the Missouri River that would be required for installation of the HDD and hydrostatic testing of the pipeline at the Missouri River crossing. Approximately 470,000 gallons of water would be required for activities associated with the installation of HDD and the hydrostatic testing of HDD pipeline segment. Dakota Access intends to submit an application to the North Dakota State Water Commission, Water Appropriations Department for a Temporary Water Permit. The exact number and size of the withdrawal pumps would be determined as a result of the limits imposed by the Temporary Water Permit. The withdrawal activity would comply with all applicable permit conditions and regulations, including the specifications on permitted intake structures outlined in the Corps' Regional Conditions for North Dakota applicable to Nationwide Permit 12 (Utility Line Activities) (Corps, 2012). This regional condition requires that the applicant 1) utilize an intake screen with a maximum mesh opening of ¼-inch; 2) wire, Johnson-like screens must have a maximum distance between wires of 1/8-inch; 3) water velocity at the intake screen shall not exceed ½-foot per second; 4) intake structure shall be floating; and 5) at the beginning of pumping, the intake shall be placed over water with a minimum depth of 20 feet.

The Acquisition point would coincide with the proposed pipeline crossing of the Missouri River. An 8"x 8" Power Associates 2500 Single Stage Pump would be set on a barge or float anchored just offshore at the proposed permanent easement. The barge/float would be approximately 12 feet wide by 14 feet long and fitted with a secondary containment structure (an Eagle 4Drum Flexible Containment SpillNest-T8103 or similar). The pump, capable of withdrawing 2,400 gallons per minute withdrawal and 120 feet of head pressure, would be placed within the secondary containment on the barge/float.

The pump's flexible intake hose would be 8 inches in diameter and connect the screened intake to the pump. The screened intake (approximately the size of a 55 gallon drum) would be suspended by floats (approximately the size of a tire) within the water column and would be screened to prevent impingement entrainment of foreign objects and aquatic life. A hard 8-inch diameter take-way pipe extending from the pump would push the water to the top of bank then to the HDD equipment or pipeline section. This temporary waterline would be laid by hand on top of the ground surface within the permanent ROW, and thus would not require any ground disturbance or trench excavation. The waterline, barge, pump, and associated equipment would be removed following completion of construction activities. A depiction of the layout of the barge, pump, and waterline is provided in **Figure 6-B**.

Water needed for HDD construction and hydrostatic testing at the Lake Oahe Crossing in Emmons and Morton counties, North Dakota would not be obtained from Lake Oahe. Required water would instead be obtained from an alternate surface water, groundwater, or commercial source and transported to the Project Area via water trucks. Water trucks would not be required to cross Corps Fee Lands. Prior to construction, Dakota Access would identify a water source for construction activities at the Lake Oahe crossing in accordance with all applicable permits and regulations.

Water discharges associated with hydrostatic testing on Corps flowage easements would be conducted in accordance with applicable permits. Hydrostatic test water discharges would not occur on Corps fee property. Dakota Access would conduct trench dewatering and hydrostatic test discharges in a manner consistent with the North Dakota Pollutant Discharge Elimination System (NDPDES) General Permit NDG-070000. Discharged hydrostatic test water would not contain additives unless written approval is received from Dakota Access and applicable permits authorize such additives. EIs would monitor permit compliance. Where appropriate, water would be discharged into an energy dissipation and/or filtering device, as described in Dakota Access' SWPPP (**Appendix A**) to remove sediment and to reduce the erosive energy of the discharge.

Of the five waterbodies located within the flowage easements Project Area and Connected Action, one ephemeral ditch (d-k8-wi-011) is located within the portion of the Project that would be crossed via the Missouri River HDD; therefore, no trenching would occur within this feature. However, a temporary waterline would be installed across this feature to transport surface water from the Missouri River to the HDD equipment. The temporary waterline would be laid on top of the ground surface, and no grading or ground disturbance in the vicinity of the waterbody crossed by the waterline would be required. The hard pipe segments would be hand-carried down the slope and assembled by hand. No tracked or wheeled equipment would be necessary for construction or removal of the temporary aboveground waterline. Four waterbodies would be temporarily impacted by pipeline construction. However, impacts on waterbodies would be minimized by conducting pipeline construction activities in accordance with applicable regulatory requirements and implementing trenchless waterbody construction procedures, as described in sections 2.3.2.6 and 2.3.2.7 and the ECP.

No waterbody would be permanently drained or filled as part of the DAPL Project, and effects on waterbodies are expected to be short-term and minor. Dakota Access would restore the area as close to its previous state and naturally functioning condition as practicable. Additionally, Dakota Access would take measures to minimize the potential for surface water contamination from an inadvertent spill of fuel or hazardous liquids during refueling or maintenance of construction equipment or during operation of aboveground facilities. Fuel and all other hazardous materials would be stored in accordance with the

requirements of Dakota Access' SPCC, SWPPP, and ECP. These documents also describe response, containment, and cleanup measures.

Table 3-5
Waterbodies within the Flowage Easements Project Area and Connected Action

Milepost	Waterbody ID	Waterbody Type	Flow Type	Delineation Source	Class of Aquatic Resource	Area of Impact
92.7	d-k8-wi-013	Ditch	Ephemeral	Field	§404	Construction and Permanent ROW
92.77	s-k8-wi-002	Stream	Perennial	Field	§404	Construction and Permanent ROW
93.23	d-k8-wi-007	Ditch	Ephemeral	Field	§404	Construction and Permanent ROW
94.64	d-k8-wi-011	Ditch	Ephemeral	Field	§404	Permanent ROW over HDD Profile (Temporary Waterline)
94.9	s-m10-wi-001/s-k2-mk-001	Stream	Perennial	Field	§10	Construction and Permanent ROW
95.1	s-k2-mk-002	Stream	Intermittent	Field	§404	Construction and Permanent ROW

The only surface waterbody identified on the federal lands Project Area is Lake Oahe (s-kc4-em-001/s-kc4-mo-002), which would be avoided via HDD. The pipe stringing corridor (Connected Action) at Lake Oahe crosses two drainageways that are indicated on the National Hydrography Dataset. Field delineations carried out by Dakota Access identified one ephemeral stream (s-kc-4-mo-004) associated with these two drainageways that intersect the pipe stringing corridor of the Connected Action. Impacts on the delineated waterbody would be entirely within the pipe stringing ATWS and are expected to be avoided by bridging the waterways for equipment and vehicle traffic during pipe stringing, fabrication and pullback. No trenching would occur within the pipe stringing ATWS. While limited grading may be necessary within the pipe stringing ATWS, no grading would be expected to occur within the waterbody itself. Vegetation may be mowed/brush-hogged, however, no root masses are anticipated to be removed. Revegetation of these areas would be in accordance with the North Dakota tree and shrub regulations and would not be impacted during operation of the Project. No trees are expected to be cleared on Corps fee-owned lands.

Table 3-6
Waterbodies within the Federal Lands Project Area and Connected Action

Milepost	Waterbody ID	Waterbody Type	Flow Type	Delineation Source	Class of Aquatic Resource	Area of Impact
166.3	s-kc4-em-001 / s-kc4-mo-002	Lake (Lake Oahe)	N/A	Field	§10	Project Area – Permanent ROW over HDD Profile
166	s-kc4-mo-004	Stream	Ephemeral	Field	§404	Connected Action – HDD Stringing Area

EIs would monitor compliance with applicable waterbody protection requirements during construction of the facilities. The Project ECP (**Appendix G**) and SWPPP (**Appendix A**) describe additional mitigation measures and contain illustrations of how sediment control devices are typically installed at waterbody crossings. Additionally, Dakota Access would maintain a vegetative buffer until the actual crossing of the waterbody takes place. Temporary sediment control measures, such as silt fence installed at each crossing, would minimize the introduction of sediment into waterbodies during construction and minimize the movement of spoil and sediment from surface runoff during and after construction. Permanent erosion control measures, such as vegetation and installation of slope breakers, would effectively stabilize riparian zones. Dakota Access would stabilize stream banks disturbed during construction using methods as directed by applicable state and/or federal permits. Trenching and dewatering activities used in construction of the proposed pipeline could temporarily alter surface drainage patterns. However, these impacts are expected to be localized and temporary, since the contours and vegetation would be returned as closely as practical to pre-construction conditions. Dewatering activities would be conducted in accordance with applicable permits and Dakota Access' SWPPP and ECP.

3.2.2 Groundwater

3.2.2.1 Affected Environment

Groundwater occurs within the Project Areas of the Corps flowage easements and federal lands in both glacial drift and bedrock aquifers. Although bedrock aquifers tend to have a greater distribution and be more continuous than Quaternary aquifers, Quaternary aquifers typically provide higher yields to wells.

Groundwater in the bedrock aquifers flows towards the Missouri River and Lake Oahe, a regional groundwater discharge zone. The water table within phreatic aquifers, which may include both Quaternary and bedrock formations, is typically a subdued replica of the surface topography. Although groundwater flow directions may vary widely particularly within localized flow regimes, overall regional flow of groundwater in the phreatic aquifer would be to the Missouri River and Lake Oahe.

The most economically important aquifers in the vicinity of the Corps flowage easements are the Cretaceous Dakota Group, the Tertiary Fort Union Group (which includes the Sentinel Butte and Bullion/Tongue River Formations), and glacial drift aquifers of the Quaternary Period (Armstrong, 1969). The glacial drift aquifers are relatively thin at the Project Area, except where they occur in buried or present-day bedrock valleys. In the absence of Quaternary aquifers, members of the Paleocene Fort Union Group commonly serve as the shallowest aquifer. Individual aquifer members of the Fort Union Group include, in descending order, the Sentinel Butte, Tongue River, Cannonball, and Ludlow Formations (Croft, 1985). Other bedrock aquifers of economic importance in the flowage easement region are the late Cretaceous Hell's Creek and Fox Hills Aquifer system and the Cretaceous Dakota Group.

Three domestic wells and six observation wells (one of which has been destroyed) are located on the flowage easements, but occur outside of the Project workspace. The closest well to the proposed pipeline centerline is a domestic well located approximately 430 feet from the centerline. The flowage easements or Connected Action do not overlie any source water protection areas.

The most economically important aquifers in Morton and Emmons counties, where the federal lands along Lake Oahe are located, include aquifers within the Cretaceous Fox Hills and Hell Creek Formations; the

Tertiary Fort Union Group, which includes the Cannonball and Ludlow Formations, Tongue River Formation, and Sentinel Butte Formation (northwest part of the county only); and alluvial and glacial drift aquifers of the Quaternary Period (Ackerman, 1980; Armstrong, 1978). The Pierre Formation is considered the base of the active near-surface aquifers, because it is thick and relatively impervious.

No water wells are located within 150 feet of the federal lands or Connected Actions at the Lake Oahe crossing. Additionally, none of the Project Area or Connected Action overlie any source water protection areas.

3.2.2.2 Impacts and Mitigation

Ground disturbance associated with conventional pipeline construction is generally limited to approximately 6 to 10 feet below the existing ground surface. Where excavation penetrates the water table, potential groundwater impacts from pipeline construction are primarily limited to the radius of influence around the excavation profile.

Construction activities, such as trenching, dewatering, and backfilling that encounter shallow aquifers would cause minor fluctuations in groundwater levels and/or increased turbidity within the aquifer adjacent to the activity due to dewatering activities. Dewatering would consist of a single or series of submersible pumps that would be lowered into the pipe trench to review excess water to facilitate pipe installation. In cases of greater water infiltration, well pointing (a series of dewatering points along the outside of the trench connected in series to a pump to enable effective dewatering of the trench) may be used. These impacts are temporary (only while the trench is open) and highly localized as the infiltration of the dewatered groundwater is in the immediate vicinity of the dewatering activity.

Construction and dewatering activities are not expected to have a significant effect on regional groundwater flow patterns. Shallow aquifers would quickly reestablish equilibrium if disturbed, and turbidity levels would rapidly subside. Consequently, the effects of construction would be minor and short-term. Impacts on deeper aquifers are not anticipated.

The introduction of contaminants to groundwater due to accidental spills of construction-related chemicals, fuels, or hydraulic fluid could have an adverse effect on groundwater quality. Spill-related impacts from construction activities are typically associated with improper fuel storage, equipment refueling, and equipment maintenance. Dakota Access' SPCC Plan outlines measures that would be implemented to avoid, minimize, prevent, and respond to releases of fuels and other hazardous substances during construction and includes measures for cleanup, documentation, and reporting of spills (**Appendix A**). Project-specific SPCCs would be developed by the selected contractor and implemented throughout construction. By implementing the protective measures set forth in these plans, groundwater contamination due to construction activities is not anticipated. The draft SPCC is included as Appendix B of **Appendix A** (SWPPP); the Project-specific plan to be developed by the Contractor would meet or exceed all conditions presented in the draft plan.

Accidental releases from the pipeline system during operations could potentially affect groundwater. As part of the pipeline operation, which is regulated by the PHMSA, Dakota Access has an ongoing maintenance, inspection, and integrity testing program to monitor the safety of the pipeline system. Monitoring activities include constant remote oversight of the entire system 24/7/365 from the control

center, routine inspection of the cathodic protection system, and the use of inspection tools that travel through the inside of the pipeline to check pipe integrity (see Section 3.11 for additional information regarding reliability and safety and the proposed methods for monitoring the Project facilities). Dakota Access also performs regular aerial flyovers to inspect the pipeline ROW. In the event of a leak, Dakota Access would work aggressively to isolate the source through the use of remote-controlled shut-off valves, initiate cleanup activities, and contact the appropriate federal and state authorities to coordinate leak containment and cleanup. Dakota Access proposes to meet or exceed all applicable regulations and requirements for pipeline design, construction, and operation.

A preliminary evaluation of geology indicates that groundwater within the floodplain throughout most of the Corps flowage easements is less than 6.5 feet deep (GeoEngineers, 2014). The pipeline would be installed in saturated sediments as part of the HDD crossing of Lake Oahe. Due to the nature of HDD methodology, this construction method is inherently not a risk to groundwater resources and uses benign substances (bentonite and water) to penetrate through soil, rock, and groundwater. Construction of the Project Area and Connected Action would not be expected to result in significant negative impacts on groundwater resources.

3.2.3 Wetlands

3.2.3.1 Affected Environment

Wetland data for the Project Areas was derived from desktop analyses along the entire route and verified by field delineations. Using data from the U.S. Fish & Wildlife Service's (USFWS) National Wetlands Inventory (NWI) dataset, aerial imagery, and topography, an experienced biologist applied professional judgment to create polygon coverage in GIS to define the areal extent of wetlands. These areas have been field-verified to ensure that the most accurate, up-to-date data is being used for permit filings.

The field wetland investigations were conducted using the on-site methodology set forth in the 1987 Corps of Engineers Wetland Delineation Manual and the 2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE, 1987; 2010b). In addition to the 1987 Manual and the Regional Supplement, wetland areas were examined through analysis of the vegetation, soils, and hydrology, as described in the Classification of Wetland and Deepwater Habitats of the U.S. and The National Wetland Plant List (Cowardin et al., 1979; Lichvar et al., 2014).

3.2.3.2 Impacts and Mitigation

The routing analysis utilized to determine the crossing locations was designed to avoid impacts to sensitive environmental resources including wetlands. Construction workspace on the flowage easements has been selected based on an absence of wetlands within the Project area and, as confirmed by field verification in 2015, no wetlands would be impacted by trench excavation within the construction ROW, ATWS, HDD workspace, or HDD stringing corridor on the flowage easements or Connected Action.

The field wetland investigations conducted by Dakota Access results identified four wetlands located within the permanent easement on the flowage easements (w-m10-wi-001_PSS, w-m10-wi-001_PEM, w-m10-wi-001_PFO, and w-m10-wi-002_PSS). These wetlands occur in the portion of the Project Area on the flowage easements that would be constructed via HDD; therefore, no trenching would occur within

these wetlands. However, following construction, a 30-foot-wide corridor centered on the proposed pipeline would be maintained in non-forested state to facilitate inspections of the pipeline, operational maintenance, and compliance with the federal pipeline safety regulations. The 30 foot permanent ROW would encompass a total of approximately 0.30 acre of the four wetlands. One of these wetlands (w-m10-wi-001_PFO), approximately 0.05 acre, is classified as a palustrine forested (PFO) wetland and would be converted to shrub-scrub or herbaceous wetland as a result of the Proposed Action since trees would be routinely removed for the life of the pipeline. The remaining palustrine emergent (PEM) wetland (w-m10-wi-001_PEM) and two palustrine scrub-shrub (PSS) wetlands (w-m10-wi-001_PSS and w-m10-wi-002_PSS), comprising a total of 0.25 acres of the permanent pipeline easement, may require infrequent vegetation clearing of encroaching woody vegetation but would otherwise remain in their natural state. Dakota Access is in the process of obtaining verification for use of Nationwide Permit 12 for the crossings of wetlands and waterbodies associated with DAPL Project.

Pending approval and receipt of applicable permits and easement permission, a temporary waterline would be installed between the shoreline and the HDD workspace on the flowage easements within the permanent ROW (**Figure 6-B**), in order to supply the HDD equipment with water needed for drilling fluid preparation and hydrostatic testing. The temporary waterline would be laid on top of the surface, and no ground disturbance of the four wetland features along the permanent easement is anticipated. The hard pipe segments would be hand-carried down the slope and assembled by hand. No tracked or wheeled equipment would be necessary for construction or removal of the temporary aboveground pipeline. No excavation or disturbance of wetlands or the river bank is anticipated.

Table 3-7 summarizes wetlands within the flowage easements that occur within the permanent ROW, which is 30-feet-wide centered on the centerline over the HDD profile and 50-feet-wide elsewhere.

Table 3-7
Wetlands within the Flowage Easements Project Area

Milepost	Wetland ID	Wetland Type	Pre-Construction Notice?	Delineation Source	Area (Acres)	Impacted Area [1]
94.7	w-m10-wi-001	Palustrine Scrub-Shrub	No	Field	0.07	Permanent ROW over HDD Profile
94.7	w-m10-wi-001	Palustrine Emergent	No	Field	0.04	Permanent ROW over HDD Profile
94.8	w-m10-wi-001	Palustrine Forested	No	Field	0.05	Permanent ROW over HDD Profile
94.9	w-m10-wi-002	Palustrine Scrub-Shrub	No	Field	0.14	Permanent ROW over HDD Profile

No wetlands would be impacted by the HDD workspace on private land and the permanent ROW on federal land at the crossing of Lake Oahe, because no wetlands exist within the Project Area and Connected Action Area at the Lake Oahe Crossing.

The Project ECP and SWPPP specify several measures to protect wetlands and waterbodies from becoming polluted with fuels or other hazardous materials during construction. These plans prohibit the storage of fuel or other hazardous materials within 100 feet of a wetland or waterbody. The ECP also specifies that equipment must be refueled at least 100 feet from waterbodies unless, due to site-specific conditions, there is no practical alternative such as the proposed pumping intake structure located on the barge at the Missouri River Crossing. In that case, the contractor must implement site-specific protective measures and containment procedures described in the ECP. Contractors would be required to provide trained personnel, appropriate equipment, and materials to contain and clean up releases of fuel, lubricating oil, or hydraulic fluid that result from equipment failure or other circumstances.

3.2.4 Floodplain

3.2.4.1 Affected Environment

Floodplains refer to the 100-year floodplain, as defined by Federal Emergency Management Agency (FEMA), and as shown on Flood Insurance Rate Maps (FIRM) or Flood Hazard Boundary Maps for all communities participating in the National Flood Insurance Program (NFIP). The 100-year floodplain is an area subjected to inundation by the 1% chance of an annual flood event. Executive Order (EO) 11988 (Floodplain Management) requires federal agencies to avoid direct or indirect support of development within the 100-year floodplain whenever there is a practical alternative.

According to the FEMA FIRM map, the seven flowage easements are located within Zone A (the 100-year floodplain) of the Missouri River in Williams County. A FEMA flood map is not available for the Connected Action within McKenzie County. The Lake Oahe crossing in Emmons County is located in Zone D, which is an area of undetermined, but possible flood hazards (FEMA, 1987). FEMA has not completed a study to determine flood hazards for Morton County; therefore, a flood map has not been published at this time.

3.2.4.2 Impacts and Mitigation

The Project has been designed in accordance with accepted floodplain management practices; therefore, no impacts on floodplain elevations or velocities are anticipated. Following construction, disturbed areas would be restored to pre-construction grades and contours, as practical. If necessary, soil displaced by installation of the 24-inch pipeline on the flowage easements would be removed from the floodplain and hauled to an upland location in order to ensure original floodplain elevations are restored

The Corps Omaha District Flood Risk and Floodplain Management Section (FRFM) is responsible for coordinating compliance with the requirements of EO 11988. The FRFM reviewed the proposed pipeline plans the portion of the DAPL Project that crosses the flowage easements for compliance with Appendix A (Typical Cut and Fill Volumes for Land Development Proposals) of NWDR 1110-2-5, Land Development Guidance at Corps Reservoir Projects and found that the lowest elevation of the Proposed Action on the flowage easements (1872.25 feet MSL) would be above the Garrison flood control pool maximum operation elevation (1854.0 feet MSL). Therefore, there would be no adverse impacts on the operation of the Garrison flood control pool. Provided that the site topography is left at its natural ground elevation after construction and all excess material is hauled off site, the FRFM concluded that there are no flood risk and floodplain management concerns associated with the Proposed Action. On April 7, 2015 the

FRFM provided Dakota Access with a memorandum verifying compliance under EO 1198 and recommending approval of the Proposed Action (Krause, 2015).

3.2.5 Levees

Based on a search of the Corps National Levee Database and FEMA FIRM maps, no levees are located within 10 miles of the Lake Oahe or flowage easement crossings (Corps, 2014). Because no levees are located within 10 miles of either crossing, construction of the Project is not expected to impact levees.

3.3 Vegetation, Agriculture, and Range Resources

Under the "no action" alternative, Dakota Access would not construct the proposed Project and no impacts on vegetation, agriculture, and range resources would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on vegetation, agriculture, and range resources, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts or insignificant permanent impacts on vegetation, agriculture, and range resources would occur as a result of the Proposed Action, as described in the sections below.

3.3.1 Vegetation

3.3.1.1 Affected Environment

Land cover was analyzed for the flowage easements and federal lands and associated Connected Actions based on the 2011 U.S. Geological Survey (USGS) National Land Cover Dataset (NLCD) and was field-verified where access was available. Land cover on the flowage easements is comprised mostly of cultivated crops, which include corn, sugar beets, alfalfa, soybeans, and spring wheat. Other present land cover types include developed areas, which are primarily roads, pasture/hay/grassland areas that are interspersed with the cultivated crops, emergent wetlands, woody wetlands, mixed forest and deciduous forest associated with the Missouri River.

Land cover on the federal lands is comprised of cultivated crops, emergent herbaceous wetlands, grassland/herbaceous, and open water. Over half of the area of the tracts is characterized as grassland/herbaceous, which primarily occurs on the west side of Lake Oahe. Cultivated cropland consists mainly of oats and canola on the east side of the Lake.

A description of each land cover type encountered at both crossing areas is provided below.

Cultivated Crop

The cultivated cropland community is characterized by land used for the production of annual crops, such as corn and soybeans. This class includes all land being actively tilled.

Deciduous Forest

Deciduous forest typically includes trees that are greater than 16 feet tall. More than 75% of the tree species in this land cover class shed foliage simultaneously in response to seasonal change.

Mixed Forest

Mixed forest are generally areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. The vegetation cover within mixed forest typically does not have either deciduous or evergreen species greater than 75% of the total tree cover.

Developed/Open Space

The developed/open space community type is dominated by lawn grasses and may include some developed areas and roads. Impervious surfaces account for less than 20% of the total cover. This class would typically include minor roads and associated ditches.

Developed/Low Intensity

The developed/low intensity community includes areas with a mixture of constructed material and vegetation. These areas most commonly include single-family housing units. Developed/low intensity in the Project Area is associated with impervious surfaces of larger roads.

Emergent Herbaceous Wetland

Refer to Section 3.2.3, which provides a description of data obtained during delineations of the wetlands that would be impacted by the Project.

Woody Wetlands

Refer to Section 4.2.3, which provides a description of data obtained during delineations of the wetlands that would be impacted by the Project.

Grassland/Herbaceous

The grassland/herbaceous community is dominated by graminoid or herbaceous vegetation. These areas are not subject to intensive management such as tilling but can be utilized for grazing.

Pasture/Hay

The pasture/hay community type consists of areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle.

Open Water

The open water cover type includes areas of open water. This land cover type is associated with Lake Oahe and the Missouri River.

3.3.1.2 Impacts and Mitigation

Temporary impacts on land cover would occur in essentially all areas within the construction footprint, the vast majority of which would return to pre-construction land cover upon completion of construction. One exception is at the flowage easement Project Area in forested areas along the permanent easement Impacts on cultivated crops make up the majority of temporary impacts and would return to cultivated crops post-construction.

Tables 3-8 and **3-9** show land cover types impacted by construction and maintenance activities. A description of each category is provided below.

Table 3-8
Land Cover Impacts on the Flowage Easements Project Area and Connected Action

Land Cover Type	Connected Action- Construction Workspace (acres)	Connected Action- Permanent ROW (acres)	Construction Workspace (acres) [1]	Permanent ROW (acres)
Cultivated Crops	0	0	47.4	13.3
Deciduous Forest	0.9	0.2	0	0
Developed, Low Intensity	0	0	0.4	0.4
Developed, Open Space	.1	.01	1.2	0.4
Emergent Herbaceous Wetlands	0	0	0.9	0.4
Hay/Pasture	0	0	6.6	1.8
Grassland/Herbaceous	.1	0	1.7	0.5
Mixed Forest	0.2	0.03	0	0
Open Water	0.7	0.1	0	0
Woody Wetlands	0	0	1.4	0.8
Total	**2.0**	**0.3**	**59.3**	**17.6**

[1] Construction workspace includes permanent ROW.

Permanent impacts on land cover in the federal lands would be limited to the permanent ROW and involve limited tree removal within the permanent easement. Impacts on land cover as part of the Connected Action would occur on private lands and include the HDD workspaces, stringing area, and the permanent easements between the HDD workspaces and federal lands.

Table 3-9
Land Cover Impacts on the Federal Lands Project Area and Connected Action

Land Cover	Connected Action – Construction Workspace (acres)	Connected Action – Permanent ROW (acres)	Federal Lands Permanent ROW (acres) [1]
Cultivated Crops	0.0	**0.0**	0.1
Emergent Herbaceous Wetlands	0.0	0.0	0.4
Woody Wetlands	0.2	**0.0**	0.0
Grassland/ Herbaceous	15.3	1.1	0.6
Total	**15.5**	**1.1**	**1.2**

Table 3-9 Land Cover Impacts on the Federal Lands Project Area and Connected Action			
Land Cover	**Connected Action – Construction Workspace (acres)**	**Connected Action – Permanent ROW (acres)**	**Federal Lands Permanent ROW (acres) [1]**

[1] Land cover impacts on federal lands are limited to the maintained 50-foot permanent easement and do not include approximately 6.3 acres of permanent easement over the HDD profile across Lake Oahe. Land cover within the banks of Lake Oahe (open water, woody wetlands, and emergent herbaceous wetlands) would not be disturbed during construction.

Measures to Protect Vegetation

Dakota Access would clear the ROW to the extent necessary to assure suitable access for construction, safe operation, and maintenance of the DAPL Project. Clearing of herbaceous vegetation during construction is anticipated to result in short-term impacts. Within areas disturbed by construction of the Project, including the flowage easements Project Area, Dakota Access would implement active revegetation measures and rapid colonization by annual and perennial herbaceous species to restore most vegetative cover within the first growing season. In areas that require permanent revegetation, Dakota Access would specify appropriate seed mixes, application rates, and seeding dates, taking into account recommendations of appropriate state and federal agencies and landowner requests. Ground disturbing activities would not occur on Corps fee-owned lands; therefore, reseeding is not anticipated in these areas. However, if reseeding were to become necessary on Corps fee-owned lands, all activities would be conducted in accordance with applicable Lake Oahe or Garrison Project revegetation guidelines.

In non-agricultural areas, vegetation cleared from ATWS would be allowed to revegetate after construction depending on arrangements with the landowner. Consequently, significant changes in cover types are not anticipated. Revegetation would allow wildlife species to return to the area after construction is completed. Temporary revegetation measures may also be implemented to quickly establish ground cover to minimize the potential for soil erosion and noxious weeds to establish. A temporary seed mix may be applied in these situations. The Project ECP (**Appendix G**) contains more details regarding temporary revegetation.

After completion of waterbody crossings, Dakota Access would revegetate disturbed stream banks in accordance with the ECP, SWPPP, and requirements of applicable state and federal permits. When constructing in agricultural areas, up to 1 foot of topsoil (organic layer) would be stripped from the trench line and stockpiled separately from trench spoil to preserve the native seed stock. The ECP contains additional details regarding topsoil segregation.

At stream approaches, the Contractor would leave a 20-foot buffer of undisturbed herbaceous vegetation on all stream banks during initial clearing, except where grading is needed for bridge installation or where restricted by applicable regulations and/or permit conditions.

3.3.2 Invasive and Noxious Weeds

3.3.2.1 Affected Environment

The state of North Dakota has 11 state-listed noxious and invasive weeds ("invasive species"). The species listed are: Russian knapweed (*Acroptilon repens*), absinth wormwood (*Artemisia absinthium*), musk thistle (*Carduus nutans*), diffuse knapweed (*Centaurea diffusa*), yellow toadflax (*Linaria vulgaris*), spotted knapweed (*Centaurea maculosa*), Canada thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), dalmatian toadflax (*Linaria dalmatica*), purple loosestrife (*Lythrum salicaria*), and saltcedar (*Tamarix chinensis*). These state invasive species are controlled and regulated under North Dakota Law (NDCC § 4.1-47-02) (North Dakota Department of Agriculture, 2014a).

Each county in North Dakota has a County Weed Board, which consists of a regulation committee to manage noxious and invasive weeds. Each of these county boards is responsible for the addition of county-specific invasive species to the state-listed species. Additional noxious weeds are listed in McKenzie County including field bindweed (*Convolvulus arvensis*), burdock (*Arctium* sp.), black hendane (*Hyoscyamus niger*), houndstongue (*Cynoglossum officinale*), and yellow starthistle (*Centaurea solstitialis*). No additional invasive species have been identified for listing in Williams, Morton, and Emmons counties.

3.3.2.2 Environmental Impact and Mitigation

Dakota Access sent notifications to the McKenzie, Williams, Morton, and Emmons counties weed boards describing the Project and requesting any guidance regarding the known locations of noxious and invasive weeds pertaining to that county. Dakota Access would work with the county weed boards to ensure the Project ECP contains relevant and necessary mitigation measures that would be implemented to prevent the spread of noxious weed species during construction and operation of the Project.

3.3.3 Threatened, Endangered, Candidate, and Proposed Plant Species

3.3.3.1 Affected Environment

There is one federally-listed plant species in North Dakota, the threatened western prairie fringed orchid. This plant species is associated with high quality moist, tall grass prairie. Most of the orchids in North Dakota are located in the Sheyenne National Grasslands in Ransom and Richland counties in the southeastern corner of the state. The population at Sheyenne National Grasslands is the largest population left in the world, with over 7,000 orchids (USFWS, 2013a).

North Dakota does not have a state threatened and endangered species program or track plant species that are not federally listed.

3.3.3.2 Impacts and Mitigation

There are no known records of western prairie fringed orchids in the Project Area counties, and no suitable habitat was documented; therefore, no effect on the western prairie fringed orchid is expected as a result

of the proposed undertaking. In the unlikely event that any are observed during construction on federal lands, work would stop and the Corps would be contacted.

3.4 Wildlife Resources

Under the "no action" alternative, Dakota Access would not construct the proposed Project, and no impacts on wildlife resources would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on wildlife resources, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts, if any, on wildlife resources would occur as a result of the Proposed Action, as described in the sections below.

3.4.1 Recreationally and Economically Important Species and Nongame Wildlife

3.4.1.1 Affected Environment

The Project region is home to a large number of mammal and bird species. Big game species that occur in the Project region include pronghorn and white-tailed deer. Game birds potentially using the types of wildlife habitat in the Project Area include the ruffed grouse, sharp-tailed grouse, pheasant, woodcock, snipe, and doves. Furbearers and predators potentially occurring within the Project Area include coyote, beaver, badger, red fox, raccoon, bobcat, fisher, mink, weasel, and muskrat. Potential small mammal species occurring within the habitat types associated with the Project Area include pocket gopher, skunk, and white-tailed jackrabbit.

Waterfowl and shorebird species potentially occurring within the Project Area include mallards, pintails, American wigeon, blue-winged teal, western grebe, California gull, Canada goose, common tern, killdeer, Wilson's phalarope, and lesser yellowlegs. Numerous songbirds, including the American goldfinch, black-capped chickadee, cedar waxwing, clay-colored sparrow, lark bunting, song sparrow, tree swallow, western kingbird, western meadowlark, and yellow warbler can be expected to occur in the Project vicinity.

Numerous species of reptiles and amphibians may also occur within the Project Area. Some amphibian species that may be expected to occur in the Project Area include the northern leopard frog, tiger salamander, and western chorus frog. Reptile species that may be expected to occur within the Project Area include common snapping turtle, western painted turtle, common garter snake, and racer (Hoberg and Gause, 1992).

3.4.1.2 Impacts and Mitigation

Temporary impacts on wildlife could occur during construction due to clearing of vegetation and movement of construction equipment along the ROW. The ROW and ATWS would remain relatively clear of vegetation until restoration is completed. Most wildlife, including the larger and more mobile animals, would disperse from the Project Area as construction activities approach. Displaced species may recolonize in adjacent, undisturbed areas, or reestablish in their previously occupied habitats after construction has been completed and suitable habitat is restored. Some smaller, less mobile wildlife

species such as amphibians, reptiles, and small mammals have the potential to be directly impacted during clearing and grading activities, but given the limited extent of the proposed crossing, measurable impacts are not anticipated.

Herbaceous cover would be seeded on disturbed upland areas during restoration, and it is expected that pre-existing herbaceous and shrub habitats would quickly reestablish themselves. Consequently, it is expected that the wildlife species that use these habitats would also return within one growing season of construction completion. Routine clearing of the permanent easement to improve visibility and remove encroaching trees would be performed in compliance with PHMSA requirements. The lack of trees reestablishing would be the only potential long-term impact to wildlife that depends on forested communities. This impact is expected to be negligible, as it only pertains to extremely small portions of the permanent easement and very little forested habitat is present within the proposed area of impact.

3.4.2 Threatened, Endangered, Candidate, and Proposed Wildlife Species

The Endangered Species Act (ESA) directs all federal agencies to work to conserve endangered and threatened species. Crossing the Corps flowage easements and federal lands triggers the consultation procedures of section 7 of the ESA. This section serves as the Biological Evaluation or written analysis documenting the Corps' conclusions and the rationale to support those conclusions regarding the effects of the Proposed Action on protected wildlife resources.

3.4.2.1 Affected Environment

Nine federally listed species have been identified in Williams, McKenzie, Morton, and Emmons counties. Designated critical habitat for the piping plover also occurs in each of the four counties

Interior Least Tern

In North Dakota, the interior least tern (*Sterna antillarum*) utilizes sparsely vegetated sandbars on the Missouri River. Birds nest, raise young, and relax on barren river sandbars. In North Dakota, the least tern is found mainly on the Missouri River from Garrison Dam south to Lake Oahe and on the Missouri and Yellowstone Rivers upstream of Lake Sakakawea. Approximately 100 pairs breed in North Dakota during the summer before flying to coastal areas of Central and South American and the Caribbean Islands (USFWS, 2013b).

Whooping Crane

Whooping cranes (*Grus americana*) embark on a bi-annual migration from summer nesting and breeding grounds in Wood Buffalo National Park in northern Alberta to the barrier islands and coastal marshes of the Aransas National Wildlife Refuge on the Gulf Coast of Texas. Twice yearly in the spring and fall, whooping cranes migrate along the Central Flyway, a migratory corridor approximately 220 miles wide and 2,400 miles in length. The Central Flyway includes eastern Montana and portions of North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, and eastern Texas (USFWS, 2014a). During the migration, cranes make numerous stops, roosting for short durations in large shallow marshes, and feeding in harvested grain fields. Approximately 75% of the whooping crane sightings in North Dakota occur within

the Central Flyway. The primary threats to whooping cranes are power lines, illegal hunting, and habitat loss.

Black-footed Ferret

The black-footed ferret (*Mustela nigripes*) is a small member of the Mustelidae family native to North American shortgrass and mixed grass prairie. Prairie dogs make up approximately 90% of the black-footed ferret diet and as such, the species is associated almost exclusively with large complexes of prairie dog towns (USFWS, 2013c; Black-footed Ferret Recovery Implementation Team [BFFRIT], 2011). Black-footed ferrets are fossorial, nocturnal predators, spending nearly 90% of their time underground in prairie dog burrows, leaving only to hunt (Defenders of Wildlife, 2014; BIFFRIT, 2011). Once thought to be extirpated in the wild, captive-born individuals have been reintroduced to 21 sites in Wyoming, Montana, South Dakota, Colorado, Utah, Kansas, New Mexico, and Arizona since 1991 (USFWS, 2013c).

Gray Wolf

A habitat generalist, the gray wolf (*Canis lupus*) historically occupied most habitat types in North America. They show little preference for one cover type over another and successfully utilize alpine, forest, grassland, shrubland, and woodland habitats across their range (Mech, 1974). Once thought to require wilderness areas with little to no human disturbance, recent range expansions have demonstrated the species' ability to tolerate higher rates of anthropogenic development than previously thought. Given abundant prey and low rates of human-caused mortality, wolves can survive in proximity to human-dominated environments (Fuller, 1989).

Northern Long-eared Bat

Northern long-eared bats (*Myotis septentrionalis*) occur throughout the eastern and north-central U.S. Eastern populations have declined significantly in recent years as a result of white-nose syndrome (WNS), a contagious fungal infection. Although historically less common in the western portion of its range than in the northern portion, northern long-eared bats occur throughout North Dakota. Habitat throughout its range includes caves and abandoned mines during the winter and hardwood or mixed forests for roosting and foraging during the summer (USFWS, 2015).

Northern long-eared bats may roost singly or in colonies in cavities, crevices, hollows, or beneath the bark of live and dead trees and/or snags, regardless of tree species. They prefer trees with a diameter at breast height of at least 3 inches. Less frequently, Northern long-eared bats have been observed roosting in man-made structures such as sheds or barns. Northern long-eared bats primarily forage at dusk on insects in forests, but will occasionally forage over small forest clearings and water (USFWS, 2015).

Piping Plover

Piping plovers (*Charadrius melodus*) are shore birds that inhabit areas near water, preferring river sandbars and alkali wetlands in the Great Plains for nesting, foraging, sheltering, brood-rearing, and dispersal. Piping plovers winter along large coastal sand or mudflats near a sandy beaches throughout the southeastern U.S. Critical Habitat for the piping plover is designated along the Missouri River system throughout North Dakota (USFWS, 2012).

Dakota Skipper

The Dakota skipper (*Hesperia dacotae*) is a small butterfly found in dry-mesic and wet-mesic tallgrass and mesic mixed grass prairie remnants characterized by alkaline and composite soils. The Dakota skipper is a habitat specialist requiring high-quality prairie habitat (i.e., grasslands or discrete patches of habitat within grasslands that are predominantly native and that have not been tilled). Only 146 populations are documented in three states and two Canadian provinces (McCabe, 1981; Royer and Marrone, 1992; Cochrane and Delphey, 2002; USFWS, 2011; 2013d). Remaining populations vary in size and density and for the most part are not influenced by dispersal between populations (McCabe, 1981; Dana, 1991; Dana, 1997; Cochrane and Delphey, 2002). The species overwinters at the base of grasses in the soil of the site which they inhabit. In North Dakota, the skipper typically occupies both wet-mesic and dry-mesic prairie (Royer and Marrone, 1992; Cochrane and Delphey, 2002). The current status of the Dakota skipper in the state is considered tenuous, and most populations are considered vulnerable due to their extremely isolated nature.

Rufa Red Knot

The rufa red knot (*Calidris canutus rufa*) is a large sandpiper noted for its long-distance migration between summer breeding grounds in the Arctic and wintering areas at high latitudes in the Southern Hemisphere (USFWS, 2014b). Some rufa red knots wintering in the northwestern Gulf of Mexico migrate through interior North America during both spring and fall and use stopover sites in the Northern Great Plains. During spring and fall migrations, rufa red knots are typically found in marine habitats along the Pacific and Atlantic coasts of North America, generally preferring sandy coastal habitats at or near tidal inlets or the mouths of bays and estuaries. However, some migrating rufa red knots use sandbars and sandy shore and beach habitats along large rivers and reservoirs of the interior of North America. This area contains the Atlantic, Mississippi, and Central Flyways (USFWS, 2014g).. The species also heavily relies on exposed substrate at wetland edges for stopover habitat, and the suitability of a wetland for rufa red knots depends on water levels and may vary annually (Gratto-Trevor et al., 2001).

Pallid Sturgeon

Pallid sturgeon (*Scaphirhynchus albus*) prefer benthic environments associated with swift waters of large turbid, free-flowing rivers with braided channels, dynamic flow patterns, periodic flooding of terrestrial habitats, and extensive microhabitat diversity. Pallid sturgeon inhabit the Missouri and Mississippi Rivers from Montana to Louisiana and have been documented in the Missouri River downstream from the Fort Peck Dam in Montana to the headwaters of Lake Sakakawea, North Dakota, and downstream from Garrison Dam, North Dakota to the headwaters of Lake Oahe, South Dakota (USFWS, 2014c). Pallid sturgeon populations are fragmented by dams on the Missouri River and are very scarce in the Lake Oahe portion of the Missouri River.

3.4.2.2 Impacts and Mitigation

Dakota Access conducted pedestrian surveys of the workspace at the flowage easements in September 2014 and July 2015 and at the Lake Oahe crossing in April 2015 to assess suitable habitat for listed species. Given the limited scope of this Project, minimization measures, and the implementation of specialized construction techniques, Dakota Access has determined that the Project would have no effect on four of

the listed species and may affect, but not likely to adversely affect five of the listed species in the Project area. **Table 3-10** lists the impact determinations of the protected species with potential to occur within the Project Area and Connected Action. A summary of habitat evaluations and the basis for the determination of impacts for each listed species is provided below.

Table 3-10
Federally Listed Species with Potential to Occur within the Project Area and Connected Action

Species	Status	County				Impact Determination
		Williams	McKenzie	Morton	Emmons	
Interior Least Tern	Endangered	X	X	X	X	May Affect, Not Likely to Adversely Affect
Whooping Crane	Endangered	X	X	X	X	May Affect, Not Likely to Adversely Affect
Black-footed Ferret	Endangered		X	X		No Effect
Gray Wolf	Endangered	X	X	X		No Effect
Northern Long-eared Bat	Threatened	X	X	X	X	No Effect
Piping Plover	Threatened	X	X	X	X	May Affect, Not Likely to Adversely Affect
Dakota Skipper	Threatened		X	X	X	No Effect
Rufa Red Knot	Threatened	X	X	X	X	May Affect, Not Likely to Adversely Affect
Pallid Sturgeon	Endangered	X	X	X	X	May Affect, Not Likely to Adversely Affect

Interior Least Tern

Suitable habitat may exist for interior least terns at the Missouri River and at the Lake Oahe crossing depending on precipitation and seasonal flow variations as exposed sand/gravel bars can be present. Dakota Access proposes to cross the Missouri River and Lake Oahe utilizing the HDD construction method to avoid direct impacts to the interior least tern. Dakota Access will implement the HDD Contingency Plan (Appendix B) at these crossings.

Dakota Access plans to withdrawal water from the Missouri River, which is required for activities associated with the installation of the HDD and the hydrostatic testing of the HDD segment. A temporary waterline would be installed at the Missouri River between the shoreline and the HDD workspace on the flowage easements within the permanent ROW (**Figure 6-B**).The temporary waterline would be laid by hand on top of the surface, and no tracked or wheeled equipment would be necessary for installation or removal of the temporary aboveground waterline. No disturbance of the river banks is anticipated. Additionally, installation and removal of the waterline are anticipated to be complete prior to nesting season; therefore, no impacts on the interior least tern are anticipated to occur at the Missouri River. If the water withdrawal activities are not able to be completed prior to nesting season as expected, Dakota Access would conduct surveys prior to placement of the waterline to confirm the presence/absence of

interior least terns within the pipeline ROW. If interior least terns are nesting within the pipeline ROW, Dakota Access would postpone water withdrawal activities at the Missouri River until the interior least terns have left the area. No water access is required to complete the crossing at Lake Oahe.

As designed, no indirect impacts, such as those associated with noise, are anticipated due to the distance (greater than 960 feet) of the drill sites from the habitat.. Potential impacts on the tern would be further reduced if construction activities occur outside the nesting season. Both direct and indirect impacts on interior least terns would be avoided and minimized through utilization of the HDD crossing method and the HDD Contingency Plan. Therefore, the Project may affect, but is not likely to adversely affect the interior least tern.

Whooping Crane

In North Dakota, whooping cranes are only present during the twice-yearly migration between winter grounds and summer nesting sites. As the whooping crane is a migrant and does not breed in North Dakota, the species cannot be confirmed as present in or absent from the Proposed Action areas. The results of the habitat assessment field surveys indicate that the Project area may contain potential suitable migratory habitat (i.e. emergent wetlands and agricultural fields) at the Missouri River crossing. If a whooping crane were to be sighted during construction of the Project, work activities would halt and the Corps would be contacted. Ongoing construction activities during the migration periods would likely cause birds to choose more suitable landing and overnight roosting locations away from construction activities given the abundance of similar habitat throughout the flyway and in the general vicinity of the Project area. However, since potential suitable migratory habitat is within the Project area and indirect impacts may occur due to disturbance during construction the Project may affect, but it not likely to adversely affect this species.

Black-footed Ferret

No suitable black-footed ferret habitat is present in the Project areas. The black-footed ferret has been recorded in Morton County; however, based on occurrence data received from North Dakota Parks and Recreation, there are no documented occurrences within the vicinity of the Project. Further, the nearest prairie dog colony (suitable habitat) is more than 0.17 mile from the proposed Lake Oahe crossing location (USFWS, 2014d). Due to the lack of suitable habitat and the distance of the Project areas from known black-footed ferret occurrences, the Project would have no effect on black-footed ferrets.

Gray Wolf

The gray wolf is listed as endangered in all three counties of the Proposed Action areas in North Dakota (south and west of the Missouri River upstream to Lake Sakakawea and west of the centerline of Highway 83 from Lake Sakakawea to the Canadian border). Wolves in eastern North Dakota are part of the Great Lakes Distinct Population Segment that was delisted by the USFWS in January 2012 (USFWS, 2014e). North Dakota does not currently have an established breeding population (North Dakota Department of Agriculture, 2014b). Observations of wolves are sporadic, and it is believed that these individuals are dispersers from adjacent populations (i.e., from Minnesota and Manitoba) (USFWS, 2006; Licht and Fritts, 1994). Given the unlikely occurrence and high mobility of this species, the Project would have no effect on gray wolves.

Northern Long-eared Bat

The northern long-eared bat is currently listed by the USFWS as threatened in North Dakota. On April 2, 2015, the USFWS published the final listing in the Federal Registrar with an effective date of May 4, 2015. The USFWS listed the northern long-eared bat as threatened and chose to exercise the option of issuing an interim 4(d) rule to allow for more flexible implementation of the ESA and "to tailor prohibitions to those that make the most sense for protecting and managing at-risk species." In areas outside of the 150-mile WNS buffer zone, incidental take from lawful activities is not prohibited. The State of North Dakota currently falls outside of the WNS 150-mile buffer zone. Per the exemptions of the interim 4(d) rule, the Project would have no effect on the northern long-eared bat (USFWS, 2015).

Piping Plover

Potentially suitable habitat may exist at the Missouri River and at the Lake Oahe crossing, depending on precipitation and seasonal flow variations. These areas are also designated as critical habitat for this species under the ESA. Direct impacts on the potentially suitable habitat would be avoided by crossing the Missouri River and Lake Oahe via HDD. Dakota Access will implement the HDD Contingency Plan (Appendix B) at these crossings.

Impacts associated with installation of the temporary waterline at the Missouri River required for activities associated with the installation of the HDD and the hydrostatic testing of the HDD segment would be avoided, as installation and removal of the waterline are anticipated to be complete prior to nesting season. If the water withdrawal activities are not able to be completed prior to nesting season as expected, Dakota Access would conduct surveys prior to placement of the waterline to confirm the presence/absence of piping plovers within the pipeline ROW. If piping plovers are nesting within the pipeline ROW, Dakota Access would postpone water withdrawal activities at the Missouri River until the piping plovers have left the area. No water access is required to complete the Lake Oahe crossing.

As designed, no indirect impacts, such as noise, are anticipated due to the distance (greater than 960 feet) of the drill sites from the habitat. Both direct and indirect impacts on piping plovers would be avoided and minimized through utilization of the HDD crossing method and the HDD Contingency Plan. Therefore, the Project may affect, but is not likely to adversely affect the piping plover.

Dakota Skipper

There is no suitable Dakota skipper habitat within the Project Area based on species occurrence and grassland analysis. As such, activities at these crossings would have no effect on this species.

Rufa Red Knot

Rufa red knots do not nest in the Project area and only occur as an occasional migrant. During spring and fall migrations, the rufa red knot has the potential to occur in North Dakota. Migrating rufa red knot would likely only occur at migratory stopover habitat (suitable shoreline and sandy beach habitat along major rivers, streams, waterbodies, and wetlands) for a brief amount of time (24 hours or less). The results of the habitat assessment field surveys indicate that potentially suitable loafing habitat (sandbar and beach habitats) for migrating rufa red knots is present at the Lake Oahe crossing. Lake Oahe would be crossed using the HDD construction method, and thus would avoid direct impacts on potential migrating rufa red knot loafing habitat. While direct impacts to the rufa red knot migratory habitat would be avoided through the HDD construction method at Lake Oahe,indirect impacts could occur due to potential disturbance during construction; therefore, the Project may affect, but is not likely to adversely affect this species.

Pallid Sturgeon

Potentially suitable habitat for the pallid sturgeon occurs at the Missouri River and Lake Oahe. Impacts on suitable habitat present within Lake Oahe would be avoided by crossing these waterbodies via HDD. Dakota Access will implement the HDD Contingency Plan (Appendix B) at both of these crossings.

Dakota Access plans to withdraw water from the Missouri River for installation activities and hydrostatic testing of the HDD segment on the flowage easements. However, potential impacts on the pallid sturgeon or suitable habitat present within the Missouri River would be avoided by implementing the conditions on permitted intake structures outlined in the Corps' Regional Conditions for North Dakota applicable to Nationwide Permit 12 (Utility Line Activities) (Corps, 2012) (see Section 3.2.1.2) and as described in the USFWS Recovery Plan for the Pallid Sturgeon (USFWS, 2014f). No water access is required to complete the Lake Oahe crossing. The HDD construction method, application of the HDD Contingency Plan, and implementation of the Corps' conditions on the intake structure within the Missouri River would avoid and minimize potential impacts to the pallid sturgeon; therefore, the Project may affect, but is not likely to adversely affect the pallid sturgeon.

3.5 Aquatic Resources

Under the "no action" alternative, Dakota Access would not construct the proposed Project, and no impacts on aquatic resources would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on aquatic resources, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts, if any, on aquatic resources would occur as a result of the Proposed Action, as described in the sections below.

3.5.1 Habitat and Communities

3.5.1.1 Affected Environment

West of Williston, the Missouri River is a braided channel varying in width from 800 feet to over 1,500 feet, with sand bars in many locations. The Yellowstone River confluence with the Missouri River is approximately 20 miles west of Williston and 3.5 river miles upstream from the proposed Missouri crossing. East of Williston, the Missouri River feeds into Lake Sakakawea, the third largest man-made lake in the U.S. formed by the Garrison Dam, several hundred miles downstream. This portion of the Missouri River is home to several fish species, including cutthroat trout, rainbow trout, brown trout, walleye, northern, and sauger. Amphibians are found along the shores and nearby riparian areas of the Missouri River. Common species found near the Missouri River crossing include Woodhouse's toad, the northern leopard frog, and western chorus frog (Hoberg and Gause, 1992).

Lake Oahe is a 232-mile-long reservoir that extends upriver from the Oahe Dam on the Missouri River from Pierre, South Dakota, to Bismarck, North Dakota. Approximately three-quarters of a mile south of the proposed pipeline crossing is the confluence of the Cannonball River into the Missouri. This portion of the Missouri River is home to several fish species, including walleye, northern pike, and channel catfish. Amphibians are found along the shores and nearby riparian areas of Missouri River. Common species found near the Lake Oahe crossing include the Great Plains toad, Woodhouse's toad, northern leopard frog, and tiger salamander (Hoberg and Gause, 1992).

3.5.1.2 Impacts and Mitigation

The Missouri River, including Lake Oahe, is the only waterbody that would be crossed by the Project with aquatic resources that have potential to be impacted by the Project.

All subsurface disturbing activities would be set back from the banks of Lake Oahe at the HDD entry point. This provides a buffer of undisturbed land between active construction and the Lake. There is potential, although very low due to setbacks of approximately 1,100 feet on the west bank and 900 feet on the east bank, for sediment to be transported from the workspace into the river during precipitation events, which could increase the local turbidity and sediment load in the lake. These increased loads have potential to temporarily affect sensitive fish eggs, fish fry, and invertebrates inhabiting the river. However, sediment levels would quickly attenuate both over time and distance and would not adversely affect resident fish populations or permanently alter existing habitat. By also implementing the erosion and sediment control measures specified in the ECP (**Appendix G**) and SWPPP (**Appendix A**), the potential for sediment transport is likely avoided or minimized. Following construction, the ROW would be restored, revegetated, maintained in an herbaceous or scrub-shrub state, and monitored in accordance with applicable regulations and permit conditions.

A successfully completed HDD crossing would minimize environmental impacts on Lake Oahe since the pipeline would be installed without disturbing the aquatic and benthic environments. However, crossings via HDD carry a low risk of an inadvertent release of drilling mud, composed primarily of bentonite (a naturally occurring fine clay) slurry. Increased levels of sedimentation and turbidity from an inadvertent release could adversely affect fish eggs, juvenile fish survival, benthic community diversity and health, and spawning habitat. Dakota Access' HDD Construction/Contingency Plan (**Appendix B**) establishes

monitoring procedures and prescribes measures to be implemented to minimize the impact in the event it occurs. All HDD operations conducted for crossing the Lake Oahe would adhere to the HDD Contingency Plan and applicable permit conditions to reduce the likelihood of an inadvertent release to minimize and mitigate environmental impacts. Dakota Access' construction contractor would ensure that the appropriate response personnel and containment equipment are available onsite to effectively implement the HDD Contingency Plan.

In addition to the crossing of Lake Oahe, aquatic resources could also be impacted during water withdrawal from the Missouri River, which is required for activities associated with the installation of HDD and the hydrostatic testing of HDD pipeline segment located on the flowage easements. However, water withdrawal activities would be conducted in accordance with all applicable permit conditions and regulations and in a manner that would not reduce water flow to a point that would impair flow or impact aquatic life. Intake screens and floats would also be utilized, as previously discussed in Section 3.2.1.2, to prevent entrainment of aquatic life and avoid impacts on aquatic resources. In addition, by placing the pump within a secondary containment structure on the barge, the potential for impacts on aquatic resources associated with accidental fuel spills or leaks is likely avoided or minimized.

The primary issue related to impacts on the aquatic environment from operation of the Project would be related to releases from the pipeline. For portions of the pipeline installed beneath the lake, the depth of the pipeline profile, increased wall thickness of the pipe, installation of remotely operated valves on both sides of the river crossing, and monitoring of the system 24/7 would further limit the potential for an inadvertent release into the waterbody. As a result, operations activities are not anticipated to impact aquatic resources or their habitat. Adherence to the Dakota Access Facility Response Plan (under development and would be issued prior to operating the Project, in accordance with PHMSA and federal regulations) would minimize potential impacts on aquatic wildlife from potential spills during the operation of the pipeline. In the event of a leak, Dakota Access would work aggressively to contain the leak, initiate cleanup activities, and contact the appropriate authorities, including the Corps.

3.6 Land Use and Recreation

Under the "no action" alternative, Dakota Access would not construct the proposed Project, and no impacts on land use and recreation would occur. However, if the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on land use and recreation, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts or insignificant permanent impacts on land use and recreation would occur as a result of the Proposed Action, as described in the sections below.

3.6.1 Land Ownership

The proposed 24-inch pipeline would cross seven contiguous Corps flowage easements over eight privately-owned parcels (**Figure 2**) that are associated with the Buford-Trenton-Irrigation District (Garrison Dam). Based upon Corps-provided easement documents and mapping, the distance across the flowage easements on the north side of the Missouri River in Williams County is approximately 14,953 feet (2.83 miles).

The flowage easements allow the Government to flood and saturate the land, surface, and subsurface of these properties. Generally, these easements prohibit the construction of structures for human habitation; provide that any other structures require written approval by the Corps; and provide that no mineral exploration, excavation or placement of fill material may occur on the easement area without the prior approval of the Corps.

The proposed pipeline route would also cross federal lands on the east and west banks of Lake Oahe in Morton and Emmons counties. The distance from the western boundary of federally-owned lands to the eastern boundary of federally-owned lands on both sides of the lake, including the width of the lake, at the proposed crossing location is approximately 6,450 feet. The proposed pipeline would be routed to parallel existing linear infrastructure (an overhead power line and a buried gas transmission pipeline) across Lake Oahe in the same area. The HDD entry and exit points, measuring approximately 200 by 250 feet, would be located on private lands, as would the stringing corridor required to facilitate the installation.

Dakota Access is securing a 50-foot-wide permanent easement along the entire Project alignment that is generally centered on the pipeline (25 feet on either side of the centerline). Within the 50-foot-wide easement, a 30-foot corridor free of large woody vegetation, located within flowage easement LL3440E on the north bank of the Missouri River, would be required to allow for a clear line of sight once construction is completed to perform visual inspections during operation of the pipeline. The corridor would be maintained in a vegetative state.

3.6.2 Land Use

3.6.2.1 Affected Environment

Land use within the Project Area was assigned a classification based on the principal land characteristic in a given area. Aerial photography, the National Land Cover Database (Multi-Resolution Land Characteristics Consortium, 2011), the Morton County Zoning Map (Morton County, 2014), and the Williams County Comprehensive Plan were used to identify and classify general land use for the Project Area (**Figures 10 and 11**).

Agricultural Land

Agriculture is the primary land use within the Project Area. These lands are primarily used for ranching and cultivating crops. Agricultural lands allows for land uses such as farming, ranching, animal feeding operations, grain storage, and related functions. Agricultural land within the flowage easements are primarily pivot irrigated cropland (i.e., areas used for production of annual crops such as corn and soybeans).

Developed Land

Developed land includes open space around structures such as homes, farmsteads, outbuildings, well sites, and areas associated with roads and ditches.

Open Space

Open space includes all land that is not agriculture or developed; namely wetlands, open water, grasslands, and scrub-shrub. Open space is found primarily along the river banks. See sections 3.2 and 3.3 for a discussion on water resources and vegetation.

3.6.2.2 Impacts and Mitigation

The proposed Project would result primarily in temporary, short-term impacts on land use during construction. Construction activities would require the temporary and short-term removal of existing agricultural land from crop and forage production within the construction footprint. During construction, temporary impacts such as soil compaction and crop damage are possible along the construction ROW. Mitigation measures to minimize impacts such as topsoil segregation and decompaction practices would be fully implemented in accordance with the ECP and SWPPP. Upon the completion of construction activities, the Project Area would be restored and returned to pre-construction land use.

As mentioned above, much of the cropland within the Corps flowage easements uses pivot irrigation systems. Dakota Access would coordinate with all landowners on acceptable methods for construction and restoration, including potential impacts to irrigated fields. Compensatory damages would be paid accordingly.

The nearest residence to the project on the flowage easements is approximately 1,750 feet east of the pipe centerline. Temporary impacts on nearby residences could include inconvenience caused by noise and dust generated from construction equipment and traffic congestion associated with the transport of equipment, materials, and construction workers. Impacts from noise and dust during construction would diminish with distance from these areas and would be limited to the time of construction which would typically occur during daylight hours.

The primary impact on family farms would be the loss of standing crops and use of the land within the work area for the seasons during which DAPL Project-related activities occur, as well as potential diminished yields for a few years following construction. Dakota Access proposes to implement mitigation measures to minimize these potential impacts as described in the ECP. Dakota Access would repair surface drains and drainage tiles disturbed during ROW preparation, construction, and maintenance activities. Dakota Access would repair or replace fences and gates removed or damaged as a result of ROW preparation, construction, or maintenance activities.

At Lake Oahe, primary impact on ranching operations would be temporary prohibition of livestock grazing in the construction ROW, workspace areas, and restrictions on livestock movement across the construction ROW and workspace areas during construction. Given the narrow, linear nature of the DAPL Project and the alignment of the pipeline along property boundaries, livestock grazing reductions and livestock movement restrictions would be minor. Long-term or permanent impacts on family ranches are not anticipated. Following construction and restoration, the work area would be restored and ranching would be allowed to continue over the operational ROW. Landowners would be compensated for temporary loss of land and lower yields. Grazing activities would return to normal after Revegetation of the disturbed areas.

Once in operation, a permanent 50 foot ROW would be maintained along the entire Project except at segments of the ROW above the HDD profile on the flowage easements (between the HDD workspace and the river shore) that would be maintained by clearing woody vegetation over a 30 foot corridor (a 50 foot easement would still be obtained). Maintenance would include the removal of any large trees and shrubs; agricultural land use would not be impacted by maintenance activities in this area. Trees would be protected by Dakota Access in a manner compatible with the safe operation, maintenance, and inspection of the pipeline. Applicable regulations would be adhered to regarding tree and shrub removal from along the route. Field surveys have confirmed that no shelter belts would be impacted within the Project Area or Connected Actions. .

Tables 3-11 and **3-12** below detail the acreage of land use impacts associated with the proposed Project.

Table 3-11
Land Use Impacts on the Flowage Easements Project Area and Connected Action

Land Use	Construction Workspace (acres) [1]	Permanent ROW (acres) [2]
Agricultural Land	54.0	15.1
Developed	1.6	0.8
Open Space	6.0	2.0
Total	**61.3**	**17.9**

[1] Construction Workspace includes the permanent ROW.
[2] Permanent ROW includes the 50-foot permanent easement and the 30-foot maintenance easement.

Table 3-12
Land Use Impacts on the Federal Lands Project Area and Connected Action

Land Use	Construction Workspace (acres)	Connected Action - Permanent ROW (acres)	Federal Lands - Permanent ROW (acres)[1]
Agricultural Land	0.0	0.0	0.1
Open Space	15.5	1.1	1.0
Total	**15.5**	**1.1**	**1.2**

[1] Land Use Impacts on federal lands are limited to the maintained 50 foot permanent easement and do not include approximately 6.3 acres of permanent easement beneath the HDD profile within the banks of Lake Oahe.

Dakota Access would obtain and comply with applicable state regulations, county permits, and zoning and land use regulations. Permits may include, but are not limited to, grade and fill permits, ditch crossing permits, road and utility permits, and conditional use permits. Dakota Access would retain one or more EIs to monitor compliance with environmental conditions of county permits.

3.6.3 Recreation and Special Interest Areas

3.6.3.1 Affected Environment

Generally, recreation and special interest areas include federal, state, or county parks and forests; conservation lands; wildlife habitat management areas; hunter management areas; natural landmarks; scenic byways; designated trails; recreational rivers; and campgrounds. Nearby recreational opportunities in the vicinity of the Proposed Action Area and the Connected Action areas include Wildlife Management Areas (WMAs), Lake Oahe, and the Missouri River, none of which are being impacted by the construction, although the HDD would cross under Lake Oahe itself.

The Missouri River and its shoreline are open to the public and used for recreational activities such as boating, swimming, and fishing. Because the flowage easements are federally regulated and privately owned, there is very limited, if any, recreational opportunities within the flowage easements. Additionally, there is little boating and open water angling on the entire upper end of Lake Sakakawea because of lack of access and extremely turbid water throughout much of the recreational season (USACE, 2007).

Lake Oahe's 2,250 mile shoreline is open to the public and offers a variety of opportunities to outdoor recreationists such as fishing, swimming, sightseeing, camping, and picnicking. More than 1.5 million visitors enjoy Lake Oahe's recreation facilities each year. Fishing is the major recreational activity of visitors to the Oahe project, with 44% of visitors engaging in this activity (USACE, 2010c).

There are no public boat access sites, marinas, or public swimming beaches within one mile of the flowage easements or federal lands crossings. There are no designated state parks or recreation areas, historic trails, scenic by-ways, designated wilderness or natural areas or other sensitive land uses that would be affected by the crossings (North Dakota Parks and Recreation Department, 2014).

At the flowage easement crossing, the closest Nationwide Rivers Inventory (NRI) segment is a one mile stretch of the Missouri River within the Fort Union Trading Post National Historic Site, which is about 9.2 river miles upstream from the crossing. At the federal lands crossing, the closest NRI segment is Square Butte Creek to the Oliver/Mercer County Line, which is about 50 river miles upstream from the Project Area (National Park Service, 2009).

North Dakota has approximately 54,373 miles of river, but no designated wild & scenic rivers USFWS et al., 2014).

Wildlife Management Areas

The North Dakota Game and Fish Department manages the Trenton and Overlook WMAs; neither of which are crossed by the proposed Project. The Trenton WMA encompasses 2,647 acres and is located southwest of Williston near Trenton, along the Missouri River and Lake Sakakawea. About 13.55 acres of the Trenton WMA extends into the eastern portion of flowage easement LL3440E (**Figure 6**) but the closest edge is approximately 800 feet from the HDD workspace. This area is largely primitive and the landscape has been allowed to develop naturally. The WMA provides recreational opportunities for fishing and hunting waterfowl, deer, and pheasants. The Overlook WMA encompasses 32 acres and is located

6.5 miles north of Cartwright, about 1,430 feet west of the HDD entry point in McKenzie County. The Overlook WMA is only accessible by boat and is used for hunting deer.

The Oahe WMA is located along Missouri River and Oahe Reservoir, about 17 miles south of Bismarck (USGS, 2014b). The proposed pipeline at the Lake Oahe crossing is about 14.5 miles south of the Oahe WMA.

Water Quality and Recreation

Section 303(d) of the CWA requires states to submit their lists of water quality limited waterbodies. This list has become known as the "TMDL list" or "Section 303(d) list." A TMDL is the amount of a particular pollutant a stream, lake, estuary, or other waterbody can "handle" without violating State water quality standards. The final 2014 Section 303(d) list, which was submitted to Environmental Protection Agency (EPA) as part of the integrated Section 305(b) water quality assessment report and Section 303(d) TMDL list, includes a list of waterbodies not meeting water quality standards and which need TMDLs.

Lake Sakakawea is on the 2014 Section 303(d) list of impaired waters as not supporting fish consumption because of high levels of methyl-mercury; however, Lake Sakakawea would not be crossed or otherwise impacted as a result of Project activities on the flowage easements. Lake Oahe is not listed as needing a TMDL and fully supports recreational use (North Dakota Department of Health, 2015). Because Lake Oahe already meets the state water quality standards, the Proposed and Connected Action Areas are not anticipated result in impacts that would cause an impairment of water quality or the designated use of Lake Oahe.

Wilderness Areas

The Wilderness Act of 1964 defines wilderness as lands that may contain ecological, geological, scientific, educational, scenic or historical value. There are three designated wilderness areas within North Dakota: Chase Lake, Lostwood, and Theodore Roosevelt Wilderness Areas. There are no designated wilderness areas, and no designated Nature Preserves or Natural Areas within one mile of either crossing (Wilderness Institute, 2014).

3.6.3.2 Impacts and Mitigation

The recreational enjoyment of wildlife (such as hunting or bird watching) may be temporarily affected by construction activities, depending on season and location. However, this effect would be short-term.

Recreationists may observe ROW clearing along the river banks. Because the pipeline would cross underneath the river via the HDD method, there would be no disruption to the course or cross-current of the river, and would not impact lake/river recreationists.

3.7 Cultural and Historic Resources and Native American Consultations

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and implemented by 36 CFR Part 800, requires Federal lead agencies to assess the effects of permitted actions on historic properties. Historic properties are defined in the NHPA as prehistoric and historic archaeological sites,

standing structures, or other historic resources listed in, or eligible for listing in the National Register of Historic Places (NRHP).

Under the "no action" alternative, Dakota Access would not construct the proposed Project and no impacts on cultural and historic resources would occur. However, If the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects could result in their own impacts on cultural and historic resources, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while no impacts on cultural and historic resources would occur as a result of the Proposed Action, as described in the sections below.

As detailed in Appendix I, an Archaeological Resource Protection Act (ARPA) permit was not required for any fee title or federal lands as these lands were determined through the Class I literature search to have been extensively surveyed for cultural resources. Subsequent conversations with Corps personnel indicated that these surveys were of sufficient intensity and no further assessment of these properties was warranted. For All Class III survey investigations were conducted on private property where land access was voluntarily given by landowners. Cultural surveys were conducted in 2014 and were completed during the 2015 survey season. **Appendix I** contains the Cultural Resources Report which details the results of the Class I literature review, survey methodology, and survey results with management recommendations. The cultural resources investigations were supervised by Principal Investigators who are permitted by the State Historical Society of North Dakota (SHSND).

3.7.1 Cultural Resources Studies

Based on data compiled from previously executed archaeological investigations it is recognized that much of the region has been inhabited by human populations for approximately 12,000 years. Throughout much of the state the recorded prehistoric occupations range from Paleoindian Period encampments to Late Prehistoric Period sites. Multiple sites have been explored that suggest the area was inhabited by societies adapted for lifestyles on the Plains and in the various geographical regions of the state dating back to 6000 BC. The current Project Areas have a moderate to high probability for archaeological deposits based on proximity to permanent water sources, topography, lack of significant ground disturbances, and depositional processes.

3.7.1.1 Affected Environment

Cultural resources background studies and field surveys were conducted for the flowage easement and federally-owned lands traversed by the Project Area. The background studies determined that one previously recorded site is mapped within the portion of the 400-ft survey corridor that traverses the flowage easements. Additionally, portions of the flowage easement Project Area have been subject to previous surveys (Larson et al., 1987). Site 32WI1367, also known as the Buford-Trenton Irrigation System (BTIS), is a National Register nominated cultural resource consisting of a pumping plant, main canal, and associated irrigation components. The BTIS construction began in 1940 and continued through the 1950's managed by the Department of Interior, Work Progress Administration, and the Farm Security Administration. The proposed Project intersects with one of the extant irrigation canals listed as a contributing element of the BTIS in the northeastern corner of Section 30 of Township 152 North, Range 103 West.

The background review for the portion of the Project area that traverses federal lands determined the federal lands have been previously surveyed for cultural resources, and eight (8) previously recorded cultural resource sites are mapped within the 400-ft environmental survey corridor. Five of these sites (32MOx0004, 32MO0054, 32MO0060, 32MO0061, and 32MO0259) are located in Morton County, on the western side of the Lake Oahe. The remaining three sites (32EM0019, 32EM0021, and 32EM0221) are located in Emmons County, on the eastern side of Lake Oahe. These sites are all situated between the banks of Lake Oahe and will be entirely avoided as the proposed HDD workspace would be positioned beyond the mapped boundaries of these sites.

The Class II/Class III cultural resource inventory of the proposed Project Area was conducted in accordance with the *North Dakota SHPO Guidelines Manual for Cultural Resources Inventory Projects* (SHSND, 2012). As outlined in Appendix I, systematic survey methods employed by field crews included surface inspection and shovel probing. Surface inspection was conducted in areas with surface visibility greater than 10 percent along fixed 15 m (49 ft) interval transects. Shovel probes were excavated on a 30 m grid in areas with less than 10 percent surface visibility. In general, shovel probing was employed minimally to document soil profile data as the majority of these areas are dominated by expansive agricultural pastures with high surface visibility.

The survey of the flowage easements resulted in the assessment of the portion of Site 32WI1367 within the survey corridor, and the documentation of a new prehistoric site (32MZ2874) located on the southern banks of the Missouri River. Dakota Access would entirely avoid impacting this NRHP-eligible canal feature by installing the pipe via HDD in this area. The HDD workspace would be off-set a sufficient distance to ensure that no components or associated features of this canal would be adversely impacted. Regarding site 32MZ2874 on the south side of the Missouri River, the HDD workspace has been designed in order to avoid impacts to this site. Exclusionary fencing would be installed along the eastern border of the HDD workspace during drilling activities to prevent inadvertent impacts or trespassing. No additional cultural resources were documented within the portion of the Project area that traverses the flowage easements.

A Class II/Class III Archaeological Survey was also conducted within a 400-foot environmental survey corridor, and along a 100-foot-wide potential stringing corridor across federal lands. Survey investigations across the federal lands resulted in the documentation of one new archaeological site (32MO570). This site consists of a singular lithic flake in isolated contexts and is recommended as not eligible for listing in the National Register of Historic Places (NRHP) and no further work is warranted.

These survey investigations did not include a revisit of the 7 previously recorded sites mapped directly adjacent to the Lake Oahe banks. The HDD workspaces for the Project are off-set from the banks of the lake by a sufficient distance to entirely avoid all seven of these previously recorded archaeological sites.

A more thorough discussion of the cultural setting, relevant previous studies, as well as geologic and geomorphic analysis of the region, and results of the current survey can be referenced in Appendix I.

As mentioned previously, survey investigations were restricted to those properties where land access was voluntarily given by landowners. As detailed in Appendix I, an Archaeological Resource Protection Act (ARPA) permit was not required for any fee title or federal lands as all Class II/III surveys were conducted

exclusively across private lands. Should significant modifications to workspace design require impacts to federal lands, Dakota Access would afford the district commander or their agent the opportunity to review ARPA or other antiquities permits that may be required to assess direct impacts to federal lands. Access to the shoreline for water acquisition is not required on Corps fee-lands.

3.7.1.2 Impacts and Mitigation

Dakota Access has conducted Class III inventory surveys throughout the 400-foot-wide survey corridor, and 100-foot-wide pullback string. Regarding the NRHP-eligible BTIS (site 32WI1367), the Project proposes to traverse one historic canal feature that has been determined to be an eligible component of the site. Impacts to this feature would be avoided via HDD to ensure the integrity of construction design for these historic-age features is preserved. This management recommendation has been included as a viable avoidance option in the Class III report submitted to both the ND SHPOs office that the USACE regional archaeological staff. To date, the SHPO has deferred consultation to the regional USACE archaeologist and has not provided comment regarding these avoidance options.

There are no other previously or newly recorded historic properties identified on or near the flowage easements that are crossed by the Project. Although there are seven previously documented cultural sites within the 400-foot survey corridor in the vicinity of the Lake Oahe crossing, these sites would not be adversely impacted by the Project. HDD workspaces, as well as staging and stringing areas would be positioned in excess of 100 feet beyond the mapped boundaries of these previously recorded sites. Specifically, the western HDD workspace would be located approximately 630 feet west of previously cultural resource sites, and the eastern HDD workspace would be located 230 feet east of the mapped cultural resources sites. Additionally, Class III survey efforts conducted within the Project workspace directly adjacent to these site boundaries were negative for cultural resources thus confirming that no cultural components associated with these sites stretch into the currently defined workspace areas. Overview maps depicting workspace design in relation to these previously recorded sites is provided in Appendix I.

In accordance with Section 106 of the NHPA, Dakota Access has made a good faith effort to identify significant historic properties within the Project area. Based on the result of these efforts, no properties consisted to be eligible, or potentially eligible for listing in the National Register of Historic Places (NRHP) would be adversely impacted by the proposed Project or Connected Action.

Dakota Access' UDP was developed (**Appendix F**) for use during all DAPL Project construction activities which describes actions that would be taken in the event of a previously unrecorded cultural resource site is discovered during construction activities. The UDP explicitly calls for work to stop until the correct authority or agency can be contacted and the find can be properly evaluated.

3.7.2 Native American Consultations

Consultation with federally-recognized tribal entities for those portions of the Project area defined for this EA has been initiated but has not been concluded, per Section 106 of the National Historic Preservation Act (NHPA). This process was initiated by the USACE in November 2014 in accordance with the Programmatic Agreement (PA) for Corps approval of initial geotechnical investigations at Lake Oahe and was concluded in January 2015. The PA process was initiated again in July 2015 for the proposed

pipeline route and associated installation methods. The USACE has been working to gather input from the various tribal interests so that tribal consultations can be accounted for in making the final decision on the DAPL project. Formal consultation was requested by a few tribes and efforts have been made to hold an on-site meeting at Lake Oahe and to have a government to government meeting, neither of which have occurred to date.

3.7.2.1 Additional Information

At the request of the Standing Rock Sioux Tribe (SRST) Tribal Historic Preservation Officer (THPO), representatives from Dakota Access attended a meeting at their THPO's office in October 2014. At this meeting Dakota Access introduced the project and route and requested that the SRST share any concerns of the route with respect to tribal interests. At this meeting the SRST THPO indicated that the Lake Oahe HDD appeared to avoid impacts to known sites of tribal significance.

3.8 Social and Economic Conditions

Under the "no action" alternative, Dakota Access would not construct the proposed Project and no impacts on social and economic conditions would occur. However, If the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on social and economic conditions, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while primarily beneficial impacts on social and economic conditions would occur as a result of the Proposed Action, as described in the sections below.

The overall Project is a $3.78 billion dollar investment directly impacting the local, regional, and national labor force by creating nearly 12,000 construction jobs. As a matter of practice and their promise as part of this Project, Dakota Access would utilize American labor to build the pipeline. Dakota Access has teamed up with the various craft and labor unions in the project regions and nationally to ensure the Project is constructed by highly qualified and experienced local and regional labor resources. These well-paying construction jobs would create considerable labor income and state income tax revenue – including the generation of more than $13.4 million in ad valorem taxes. Upon authorization, the Project would put welders, mechanics, electricians, pipefitters, heavy equipment operators, and others within the heavy construction industry to work.

3.8.1 Demographics, Employment, and Income

3.8.1.1 Affected Environment

Population, employment, and economic data were collected using Census tracts within a 0.5 mile radius of the Proposed Action.

Two Census tracts were identified in the vicinity of the flowage easement crossing, including CT9625 in McKenzie County and CT9535 in Williams County. The total population for CT9625 in McKenzie County is 1,504 and 1,540 for CT9535 in Williams County. There are a 557 and 618, respectively, households in the effected Census tracts in McKenzie and Williams counties. Unemployment in McKenzie County CT9625 is

1.2% and in Williams County CT 9535 is 1.7%. For those who are employed, agriculture employs the largest number of people in both Census tracts, followed by educational services, health care and social assistance fields. Construction is the third largest industry that employs residents in the two Census tracts.

Near the Lake Oahe crossing, two Census tracts were identified for this EA, including CT9665 in Emmons County and CT204 in Morton County. The total population for CT9665 in Emmons County is 3,521 and 3,063 for CT204 in Morton County. There are 1,634 and 1,236, respectively, households in the effected Census tracts in Emmons and Morton counties. Unemployment in Emmons County CT9665 is 4.9% and in Morton County CT204 is 1.5%. For those who are employed, agriculture employs the largest number of people CT9665 in Emmons County, followed by educational services, health care and social assistance fields. Construction is the third largest industry that employs residents in CT9665 in Emmons County. Educational services, and health care and social assistance is the leading industry employer in CT204 in Morton County followed by agriculture. Retail trade is the third largest industry employing residents in CT204 in Morton County.

3.8.1.2 Impacts and Mitigation

The Project is assumed to have a short construction window with a small number of construction workers dedicated to these crossings. It is possible that counties within the Project Area could experience short-term temporary effects to the local economy through induced spending from construction employees working on the crossing. No residential homes or farms would be relocated resulting from the proposed action. Additionally, no demographic changes in the Census tracts affected are anticipated because no permanent employees would be created as a result of the Proposed Action.

The Project also has tremendous secondary and sustainable economic benefits to the United States by supporting energy independence, increasing employment opportunities, and adding to demand in many manufacturing sectors, which would be a boost to the overall economy. When considering the economic impact and benefit, once U.S. workers are employed on the Project, consistent with most mega-infrastructure projects, the workers would spend their earnings in the communities where they work and live, resulting in multiplied economic impacts that would be nearly $5 billion just during the construction phase. This economic impact would affect manufacturing in many domestic sectors such as the following examples. It result in new vehicles being purchased, which positively impacts the auto industry. It would result in new homes being built, which improves and increases the housing construction, resale, and lending business located in the region and across the U.S. It impacts the food industry by requiring more food services and products to be delivered and consumed in the DAPL Project region. The list could continue with a description of many secondary benefits, but in summary, the economic impact to the U.S. as well as the immediate region where the pipeline is located is tremendous and critical to keep Americans employed and our economy moving forward.

3.9 Environmental Justice

Under the “no action” alternative, Dakota Access would not construct the proposed Project and no environmental justice impacts would occur. However, If the objectives of the Project are to be met under the “no action” alternative, other projects and activities would be required and these projects could result in their own environmental injustice impacts, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the “no

action" alternative are unknown, while no disproportional impacts on minority or low-income populations would occur as a result of the Proposed Action, as described in the sections below.

3.9.1 Affected Environment

EO 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires all federal agencies to identify and address disproportionately high and adverse human health or environmental of their programs and policies on minority and low-income populations and communities. The CEQ guidance suggests that an environmental justice population may be identified if "the minority population percentage of the affected area exceeds 50%, or if the minority population percentage of the affected area is meaningfully greater than the minority population in the general population or other appropriate unit of geographic analysis" (CEQ, 1997). The CEQ defines low-income populations based on an annual statistical poverty threshold. In 2013, the poverty threshold for the 48 contiguous states for an individual under the age of 65 living alone was $12,119 (U.S. Census Bureau, 2014). In this analysis, low-income populations were identified when the percentage of the population living below the poverty rate exceeded the U.S. average, which is 14.9%. EPA has identified ten communities across the U.S. termed Environmental Justice Showcase Communities where EPA has committed to address environmental justice challenges existing in those communities.

3.9.2 Impacts and Mitigation

No appreciable minority or low-income populations exist in these Census tracts at either crossing (**Tables 3-13** through **3-16**). Therefore, this topic was omitted from further analysis in this EA.

Table 3-13
Minority Population Statistics for the Flowage Easements Project Area and Connected Action

Location	Total Population	Percent							
		White Alone[1]	Black	NA/AN[2]	Asian Alone	Pacific Islander	Two or More Races	Other	Hispanic or Latino[3]
FEDERAL									
United States	309,138,711	63.7	12.2	0.7	4.8	0.2	2	0.2	16.4
STATE									
North Dakota	676,253	90.0	1.2	5.3	1.0	0.1	1.7	0.7	2.1
COUNTY									
McKenzie County	6,692	76.6	0.2	20.4	0.6	0.0	1.6	0.6	2.7
Williams County	23,287	91.5	0.2	5.0	0.3	0.1	1.7	1.2	2.3
LOCAL									
McKenzie County									
CT9625	1,418	98.4	0.0	0.8	0.2	0.0	0.3	0.3	1.2
Williams County									

Table 3-13
Minority Population Statistics for the Flowage Easements Project Area and Connected Action

Location	Total Population	Percent							
		White Alone[1]	Black	NA/AN[2]	Asian Alone	Pacific Islander	Two or More Races	Other	Hispanic or Latino[3]
CT9535	24,563	91.4	0.4	5.0	0.5	0.0	1.4	1.4	2.5

Source: U.S. Census Bureau, American Community Survey (2008-2012 5-year estimates).
[1] White Alone, not Hispanic or Latino.
[2] NA/AN: Native American/Alaska Native.
[3] Hispanic or Latino is ethnicity not race, although is still considered in this analysis.

Table 3-14
Low-Income Population Statistics for the Flowage Easements Project Area and Connected Action

Location	Median Household Income ($)	Persons Below the Poverty Level (%)
FEDERAL		
United States	53,046	14.9
STATE		
North Dakota	51,641	12.1
COUNTY		
McKenzie County	61,893	13.2
Williams County	69,617	8.1
LOCAL		
McKenzie County		
CT9625	65,650	6.1
Williams County		
CT9535	72,500	9.9

Source: U.S. Census Bureau, American Community Survey (2008-2012 5-year estimates).

No Environmental Justice Showcase Communities potentially affected by the Proposed Action are located within the federal lands or flowage easement Project Area (EPA, 2012).

Table 3-15
Minority Population Statistics for the Federal Lands Project Area

Location	Total Population	Percent							
		White Alone[1]	Black	NA/AN[2]	Asian Alone	Pacific Islander	Two or More Races	Other	Hispanic or Latino[3]
FEDERAL									
United States	309,138,711	63.7	12.2	0.7	4.8	0.2	2	0.2	16.4
STATE									
North Dakota	676,253	90.0	1.2	5.3	1.0	0.1	1.7	0.7	2.1
COUNTY									
Emmons County	3,544	99.4	0.0	0.3	0.0	0.0	0.3	0.1	0.2

Table 3-15 Minority Population Statistics for the Federal Lands Project Area									
Location	Total Population	Percent							
		White Alone[1]	Black	NA/AN[2]	Asian Alone	Pacific Islander	Two or More Races	Other	Hispanic or Latino[3]
Morton County	27,439	93.8	0.5	3.7	0.2	0.0	1.3	0.5	1.5
LOCAL									
Emmons County									
CT9665	3,521	98.7	0.0	0.1	0.4	0	0.8	0.1	0.2
Morton County									
CT204	3,063	97.6	0.0	1.7	0.0	0.0	0.7	0.0	0.0

Source: U.S. Census Bureau, American Community Survey (2008-2012 5-year estimates).
[1] White Alone, not Hispanic or Latino.
[2] NA/AN: Native American/Alaska Native.
[3] Hispanic or Latino is ethnicity not race, although is still considered in this analysis.

Table 3-16 Low-Income Population Statistics for the Federal Lands Project Area		
Location	Median Household Income ($)	Persons Below the Poverty Level (%)
FEDERAL		
United States	53,046	14.9
STATE		
North Dakota	51,641	12.1
COUNTY		
Emmons County	37,304	14.7
Morton County	57,988	8.8
LOCAL		
Emmons County		
CT9665	37,304	14.7
Morton County		
CT0204	78,135	5.0

Source: U.S. Census Bureau, American Community Survey (2008-2012 5-year estimates).

3.10 Hazardous Waste

The EPA (2015) defines hazardous waste as waste that is dangerous or potentially harmful to our health or the environment, occurring as liquids, solids, gases, or sludges. They can be generated through the disposal of commercial products, such as cleaning fluids or pesticides, or manufacturing processes. Improper management and disposal of hazardous substances can lead to pollution of groundwater or other drinking water supplies and the contamination of surface water and soil. The primary federal regulations for the management and disposal of hazardous substances are the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA).

A review of regulated facilities for hazardous materials along the Project corridor was conducted by searching online records maintained by the EPA (2014). Presently, there are no recognized Radiation Information Database, Brownfields, Superfund, Toxic Release Inventory, or air emission sites within one mile of the flowage easements and Lake Oahe crossings. No operating sensitive receptors, such as schools or hospitals, are reported within at least one mile. Additionally, there are no NPDES discharge sites within one mile of the Project Areas.

With the Proposed Action, there is potential for temporary impacts to public safety from hazardous material use. Other hazards to worker safety may also exist along the Project corridor, but do not pose a significant impact. Because there were no regulated sites found within the one-mile search radius of the Project Area, no impacts to the Project, Project media, or worker safety are expected. In the unlikely event contamination is encountered during construction, the UDP **(Appendix F)** would be implemented to protect people and the environment and avoid or minimize any effects from unearthing the material.

Any hazardous materials discovered, generated, or used during construction would be managed and disposed of in accordance with applicable local, tribal, state, and federal regulations. Should emergency response be required during construction, the contractor would have some of their own trained or contracted responders, and local response teams would be expected to assist.

Dakota Access would comply with any laws, regulations, conditions, or instructions issued by the EPA, or any Federal, state, or local governmental agency having jurisdiction to abate or prevent pollution, such as the RCRA, and State hazardous waste management rules.

3.11 Reliability and Safety

The PHMSA, a federal agency within the U.S. DOT is the primary federal regulatory agency responsible for ensuring the safety of America's energy pipelines, including crude oil pipeline systems. As a part of that responsibility, PHMSA established regulatory requirements for the construction, operation, maintenance, monitoring, inspection, and repair of liquid pipeline systems.

Construction activities could present safety risks to those performing the activities, residents and other pedestrians in the neighborhood. Given the low population density of the area, risks would be limited to workers involved with the Project. All activities would be conducted in a safe manner in accordance with the standards specified in the Occupational Safety and Health Administration (OSHA) regulations.

To prevent pipeline failures resulting in inadvertent releases, Dakota Access would construct and maintain the pipeline to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe would meet PHMSA specifications under 49 CFR § 195, follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and American Petroleum Institute (API). Once installed, the pipeline would be subjected to testing to verify its integrity and compliance with specifications, including hydrostatic pressure testing at the crossings, checking coating integrity, and X-ray inspection of the welds. The pipeline would be placed into service only after inspection to verify compliance with all construction standards and requirements. Dakota Access would maintain and inspect the pipeline in accordance with PHMSA regulations, industry codes and prudent pipeline operating protocols and techniques. The pipeline ROW would be patrolled and inspected by air every 10 days, weather permitting, but at least every three weeks and not less than 26 times per year, to

check for abnormal conditions or dangerous activities, such as unauthorized excavation along the pipeline route.

As previously discussed, Dakota Access is currently drafting a Facility Response Plan, in accordance with 49 CFR 194, which details the procedures to be implemented in the event of an inadvertent pipeline release and would be in place prior to commencing transportation of crude oil. Dakota Access anticipates submitting the Facility Response Plan to PHMSA for review and approval in the third quarter of 2016 by PHMSA and would provide a copy to the Corps at this time.

Following completion of construction and throughout operation of the Project facilities, the Operator and qualified contractors would maintain emergency response equipment and personnel at strategic points along the pipeline route. These personnel would be trained to respond to pipeline emergencies as well as in the National Incident Management System (NIMS) Incident Command System (ICS). Additionally, contracts would be in place with oil spill response companies that have the capability to mobilize to support cleanup and remediation efforts in the event of a pipeline release. The operator would also coordinate with local emergency responders in preventing and responding to any pipeline related problems. These activities would include conducting and hosting, over a period of time, emergency response drills with both Dakota Access employees and local emergency responders along the pipeline route.

In addition to the testing and inspection measures listed above, Dakota Access would utilize a supervisory control and data acquisition (SCADA) system to provide constant remote oversight of the pipeline facilities. Power for the SCADA system would be provided from an existing power grid. In the event of a power outage, a 500 watt Uninterruptable Power Supply would supply low voltage power to the Programmable Logic Controller and communication equipment. Communication with the SCADA system would be accomplished via satellite (Hughes Global Network) and telephone (4G cellular [ATT] or landline depending on availability/coverage). Both forms of communication are continually engaged to poll information from these sites for 100% reliable remote monitoring / operation of these sites through the SCADA system to the Operations Control Center (OCC) in Sugarland, Texas (a backup control room is located in Bryan, Texas), and are proven to have the least potential for interruption during pipeline operations.

If an alarm criteria threshold is met, the SCADA system would alert Dakota Access' OCC Operators, located in Sugarland and Bryan, Texas, of rapid drops in pressure, who would then activate the controls as necessary and initiate procedures for an appropriate response. The OCC prioritizes and responds to all alarms in accordance with the control room management regulations referenced in PHMSA CFR 195.446 (e). This regulation requires that the OCC Operator have a SCADA system alarm management plan; in general, the plan must include review of the SCADA alarm operations to ensure alarms support safe pipeline operations, identify any required maintenance that may affect safety at least once every calendar month, verify correct safety-related alarm values and descriptions at least once every calendar year when associated field equipment are changed or calibrated, determine effectiveness of the alarm management plan through a yearly review, and monitor content and volume of activity at least once a calendar year to assure controllers have adequate time to review incoming alarms. Leak Warn, a leading software program for monitoring pipelines, is being tailored to the pipeline facilities, in accordance with Pipeline and Hazardous Materials Safety Administration requirements. The Operator would utilize a Computational Pipeline Monitoring System (CPM) to monitor the pipeline for leaks. The CPM is a state-of-the-art pipeline

monitoring tool and features a real-time transient model that is based on pipeline pressure, flow, and temperature data, which is polled from various field instruments every 6 seconds and updates the model calculations to detect pipeline system variations every 30 seconds. After the system is tuned, this state-of-the-art CPM system is capable of detecting leaks down to 1 percent or better of the pipeline flow rate within a time span of approximately 1 hour or less and capable of providing rupture detection within 1 to 3 minutes. In the event that a leak is confirmed through verification, pump station shutdown would be initiated within a predetermined amount of time to effectuate. Next, the remotely controlled isolation valves (mainline valve sites would be installed on both sides of large waterbody crossings for isolation in the event of an emergency shutdown), which are operable from the OCC, would be closed. These valves have a closure time of no greater than three (3) minutes. Monitoring of the pipeline segments installed via HDD would be accomplished in the same manner as those segments installed by conventional methods (i.e., SCADA, internal inspection devices, and aerial patrols). Typically, repairs are not made on any section of pipe greater than 10 to 20 feet below the ground surface depending on the repair needed. If a material impact was on the pipeline below the 10-foot depth, operation of the system would be modified accordingly (e.g., reduce operating pressure) or the line would be re-drilled. If inspections identify an anomaly, requirements would be followed to comply with U.S. DOT requirements.

3.12 Air Quality and Noise

Under the "no action" alternative, Dakota Access would not construct the proposed Project and no impacts on air quality and noise would occur. However, If the objectives of the Project are to be met under the "no action" alternative, other projects and activities would be required and these projects would result in their own impacts on air quality and noise, which would likely be similar to or greater than the proposed Project. Nevertheless, the impacts associated with a future project developed in response to the "no action" alternative are unknown, while only temporary and minor impacts on air quality and noise would occur as a result of the Proposed Action, as described in the sections below.

3.12.1 Air Quality

3.12.1.1 Affected Environment

The Clean Air Act (CAA) of 1970 requires that states adopt ambient air quality standards. The CAA (42 USC 7401 et seq.) establishes ambient air quality standards, permit requirements for both stationary and mobile sources, and standards for acid deposition and stratospheric ozone (O3) protection. The standards have been established in order to protect the public from potentially harmful amounts of pollutants. Under the CAA, the EPA establishes primary and secondary air quality standards. Primary air quality standards protect public health, including the health of "sensitive populations, such as people with asthma, children, and older adults." Secondary air quality standards protect public welfare by promoting ecosystem health, and preventing decreased visibility and damage to crops and buildings.

According to the EPA, North Dakota has no nonattainment areas for criteria pollutants. The Bismarck air quality monitoring station in Burleigh County is located approximately 23 miles north-northwest of the Lake Oahe crossing. The Bismarck air quality monitoring station measures sulfur dioxide, nitrogen dioxide, particulate matter, ground-level ozone, and meteorological data (North Dakota Department of Health, 2013). The Williston air quality monitoring station in Williams County is located approximately 18 miles northeast of the flowage easement crossing. The Williston air quality monitoring station measures

particulate matter, ground-level ozone, and meteorological data. The monitoring objective of both stations is to measure population exposure to air quality parameters.

Monitoring data for these stations from 2003-2013 show pollutant levels for sulfur dioxide, nitrogen dioxide, ozone, and particulate matter did not exceed state or deferral ambient air quality standards at any of the state-operated monitoring sites (North Dakota Department of Health, 2013).

3.12.1.2 Impacts and Mitigation

With the Proposed Action, no long-term impacts to air quality would occur; the proposed pipeline would not emit any criteria air pollutants.. Short-term impacts to air quality may occur during construction phase of the Project. The contribution of the Project to greenhouse gas emissions during construction would be considered a minor indirect impact to climate change.

During construction, emissions from fuel-burning internal combustion engines (e.g., transportation trucks, heavy equipment, drill rigs, etc.) would temporarily increase the levels of some of the criteria pollutants, including carbon monoxide, nitrogen dioxide, ozone, particulate matter, and non-criteria pollutants such as volatile organic compounds. Construction of the Lake Oahe crossing is likely to take six to eight weeks to complete. Conventional pipeline construction across the flowage easements would take approximately two weeks and activities at the HDD exit point for crossing the Missouri River on the flowage easement LL3440E would likely operate for four to six weeks. To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum and engines would be properly maintained. This temporary increase in emissions is not expected to impact air quality or visibility in the region long-term.

3.12.2 Noise

3.12.2.1 Affected Environment

Sound is a sequence of waves of pressure that propagates through compressible media such as air or water. When sound becomes excessive, annoying, or unwanted it is referred to as noise.

Decibels (dB) are the units of measurement used to quantify the intensity of noise. To account for the human ear's sensitivity to low level noises, the decibel values are corrected for human hearing to weighted values known as decibels of the A-weighted scale (dBA; see **Table 3-17**). The EPA has set values that should not be exceeded. While the primary responsibility of regulating noise was transferred from the EPA to state and local governments in 1981, the Noise Control Act of 1972 and the Quiet Communities Act of 1978 are still in effect.

Table 3-17
Noise Values

Area	Noise Level	Effect
All areas	Leq (24) < 70 dBA	Hearing
Outdoors in residential areas and farms where people spend varying amounts of time in which quiet is a basis for use	Ldn < 55 dBA	Outdoor activity interference and annoyance

Table 3-17 Noise Values		
Area	**Noise Level**	**Effect**
Outdoor areas where people spend limited time such as school yards, playgrounds, etc.	Leq (24) < 55 dBA	Outdoor activity interference and annoyance
Indoor residential areas	Ldn < 45 dBA	Indoor activity interference and annoyance
Indoor areas with human activities such as schools, etc.	Leq (24) < 45 dBA	Indoor activity interference and annoyance

Source: (The Engineering ToolBox, 2015)
Leq: 24-hr equivalent sound level
Ldn: day-night average sound level

The dominant land use in the proposed Project Area is agricultural. The Day-Night Average Sound (L_{dn}) level for agricultural crop land is 44 dBA, and rural residential is 39 dBA (The Engineering ToolBox, 2015).

3.12.2.2 Impacts and Mitigation

Construction of the Project would temporarily affect the noise levels on and around the flowage easement and federal lands crossing areas. Construction would cause temporary increases in the ambient sound environment in the areas immediately surrounding active construction. The use of heavy equipment or trucks would be the primary noise source during construction and excavation. The level of impact would vary by equipment type, duration of construction activity and the distance between the noise source and the receptor. Construction activities would typically be limited only to daytime hours. Potential exceptions include work determined necessary based on weather conditions, safety considerations, and/or critical stages of the HDD [e.g. if pausing for the night would put the drill at risk of closing or jamming].

Once constructed and in-service, normal pipeline operations are not audible and noise impacts would be limited to the short-term construction window. Dakota Access would mitigate noise impacts by limiting equipment running times and the duration of Project construction to the minimum amount necessary to complete the Project. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime only).

It is not anticipated that the temporary increase in ambient sound levels associated with construction would result in a significant noise impact.

4.0 CUMULATIVE IMPACTS

Cumulative impacts to the environment result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts may result from individually minor but collectively significant actions taking place over a period of time 40 CFR Part 1508.

Consultation with the North Dakota Public Service Commission (NDPSC) personnel, and subsequent evaluation of its online resources, provided a systematic source of information that was useful for evaluating cumulative impacts. Although the NDPSC does not maintain a centralized repository for energy infrastructure development projects, it provides a summary of siting applications, which offers one metric of energy project development (excluding gathering lines), particularly over time (NDPSC, 2012a). The siting application summary (NDPSC, 2012b) contains records starting in 1996. The number of statewide siting applications increases markedly starting in 2007, coinciding with development of the Bakken Formation oil field. Prior to that, only three to four applications would typically be submitted on an annual basis (NDPSC, 2012a).

Past actions in the vicinity of the Project include oil and gas development and associated infrastructure, utility installation, and agriculture. These past activities most likely have had effects on soils, water resources, vegetation, wildlife, land use, visual resources, paleontological resources, and cultural resources. The Dakota Access Project route was sited to minimize green-space impacts by co-locating with existing utility corridors over much of its length. As a result, the flowage easement crossing, as designed, would be co-located with a Oneok/TransCanada natural gas pipeline and the Lake Oahe HDD would be co-located with a natural gas pipeline and a 345 kV power line. At both of these locations, the predominant land use is agriculture. In addition to ongoing agricultural practices and the expansion of regional oil and gas development activities, cumulative impacts associated with the Dakota Access Project as whole were also considered.

Cumulative impacts were evaluated for the following resources and were determined to be negligible or nonexistent based on past and foreseeable future actions in the Project Area and the minor and temporary contribution of the Project to effects on these resources:

- Geology and Soils — Section 4.1
- Water and Aquatic Life Resources — Section 4.2
- Vegetation, Agriculture, and Range Resources — Section 4.3
- Threatened, Endangered, Candidate, and Proposed Species — Section 4.4
- Wildlife Resources — Section 4.5
- Land Use and Recreation — Section 4.6
- Cultural and Historic Resources and Native American Consultations — Section 4.7
- Social and Economic Conditions — Section 4.8
- Transportation and Traffic — Section 4.9
- Environmental Justice — Section 4.10
- Air Quality and Noise — Section 4.11

4.1 Geology and Soils

The continued development of oil and gas exploration and production in the region at its current level increases the potential for adverse cumulative impacts to geologic resources. Cumulative impacts could occur when future utilities seek to be co-located within existing corridors or alternatively when greenfield development occurs in landslide prone or highly erodible areas. However, with the proper implementation of reclamation and restoration BMPs these impacts can be reduced.

A second potential cumulative impact to geologic resources is the continued exploitation of the mineral resource which could lead to complete depletion of the resource. The mineral resource is understood to be finite. The effect would be primarily economic to the various entities with financial interests; secondarily there could be indirect impacts, potentially beneficial, associated with technological advances within the industry that would facilitate the recovery of mineral resources that cannot be recovered currently.

Agricultural practices throughout the region as well as the thousands of miles of gathering pipelines that may be built in the region on an annual basis could contribute to cumulative impacts on soils. Agricultural practices can result in increased erosion and runoff when soils are exposed for long periods such as when fields are fallow or prior to seeding. Impacts to soils as a result of pipeline installation are typically associated with excavation activities which may result in compaction and erosion when soils are exposed prior to revegetation. Impacts to soils as a result of the Project would be mitigated through the implementation of BMPs which may include topsoil segregation, erosion controls, and decompaction. Furthermore, adherence to NPDES permits would require adequate design, grading, and use of BMPs to ensure that erosion and sediment control measures are properly utilized. Generally, because of the utilization of top soil segregation and erosion controls, as well as the minimal workspace requirements and minimum duration of exposed excavations during construction of the Project, the cumulative impacts on soils resulting from construction of the Project when combined with agricultural practices and other pipeline installations would not be significant.

No impacts on mineral extraction, mining, or other deeper geologic resources would be cumulative, since these uses of geologic resources (*i.e.,* mining) do not occur in the Project Area. Clearing and grading associated with construction of the Project and other projects in the vicinity could increase soil erosion in the area. Because the direct effects would be localized and limited primarily to the period of construction, cumulative impacts on geology, soils, and sediments would only occur if other Projects were constructed at the same time and place as the proposed Project facilities.

4.2 Water and Aquatic Life Resources

Impacts on water resources (i.e., groundwater, surface waters, wetlands) associated with the Project would be avoided, temporary, and/or minor, as all surface waterbodies would be crossed via trenchless methods (i.e., HDD or bore), no permanent fill or loss of wetlands are anticipated, and potential spill-related impacts would be avoided or greatly reduced by regulating fuel storage and refueling activities and by requiring immediate cleanup should a spill or leak occur.

Recently completed construction or current construction within the vicinity of the proposed Project could extend the period of exposure of soils as a result of incomplete revegetation. These exposed soils may

increase the potential for soil erosion or sediment transport via overland flow during precipitation events resulting in sedimentation in surface waterbodies. These increased loads could have the potential to temporarily impact water quality, wetlands, and sensitive fish eggs, fish fry, and invertebrates inhabiting waterbodies in the Project watersheds. However, all projects, including the Dakota Access Project as a whole, are subject to regulation by the USACE under the CWA. By installing the pipeline using the HDD technique at the Missouri River and Lake Oahe crossings, as well as other crossings associated with the Dakota Access Project as a whole, and implementing the erosion and sediment control measures specified in the ECP (**Appendix G**) and SWPPP (**Appendix A**), the potential for increased sediment loading from terrestrial sources is minimized and the cumulative effect is considered to be negligible.

In addition to water quality impacts associated with sediment loading from erosion and run-off, an inadvertent release of non-hazardous drilling mud could occur during HDD activities, including those at Lake Oahe and the Missouri River. The likelihood of inadvertent releases of drilling mud is greatly minimized through thorough geotechnical analysis and detailed design/mitigation plans at each crossing and careful monitoring of drilling mud returns and pressure during HDD activities. If an inadvertent release were to occur within a waterbody during HDD activities, such as those at the Missouri River and Lake Oahe crossings, impacts on water quality and aquatic resources would be minor. Drilling mud is non-hazardous and impacts on water quality and aquatic resources would be akin to those associated with sediment loading. Due to the quantity of drilling mud used in relation to the size of waterbodies typically crossed via HDD, impacts would be temporary and mitigated through implementation of an HDD Contingency Plan (**Appendix B**) Impacts on all waterbodies crossed by the Dakota Access Project in its entirety would be minimized or avoided via HDD and/or use of erosion and sediment control measures; thereby minimizing the potential for cumulative impacts on water and aquatic life resources.

Impacts on water and aquatic life resources associated with sediment loading, including potential inadvertent releases of non-hazardous drilling mud, as a result of the proposed Project and the Dakota Access Project as a whole would be temporary and short term. Therefore, these impacts, when evaluated with other oil and gas development and infrastructure projects in the region and agricultural practices, would result in minor cumulative impacts on water and aquatic life resources.

Spills or leaks of hazardous liquids during construction and operation of the proposed Project, or other projects in the vicinity, have the potential to result in long-term impacts on surface and groundwater resources as well as aquatic life resources. However, construction impacts would be mitigated by the proper design and implementation of BMPs would ensure avoidance, minimization, and/or mitigation of potential impacts on water resources and aquatic resources, as required by the various regulating agencies that have jurisdiction over the project. Operational risks are being mitigated by the Project design; the Project would be designed to meet or exceed the applicable federal regulations as detailed in Sec 3.10- Reliability and Safety. Therefore, the potential cumulative impacts on water resources and aquatic resources resulting from spills would be minor.

In addition, while construction and operation of the Project along with the other potential projects and activities could result in cumulative impacts on existing wetlands in the Project watersheds, regulation of activities under the CWA by the Corps requires permitting and mitigation for wetland impacts so that there would be no net loss in the regional wetland resources. Therefore, cumulative impacts on wetland resources in the Project Area would be minimal.

4.3 Vegetation, Agriculture, and Range Resources

As described within Section 3.3.1, all vegetation disturbed by construction within the flowage easements and the Project Area/Connected Actions of the federal lands would be restored to pre-construction conditions following the completion of construction activities, with the exception of one PFO wetland located within the permanent ROW on the flowage easements that would be converted to shrub-scrub or herbaceous wetlands.

No forest fragmentation would occur as a result of construction and operation of the Project within the flowage easements and the Project Area/Connected Actions of the federal lands. No interior (core) forest habitat is crossed by the Project, and the only wooded area that would be permanently impacted by the Project include one PFO wetland (0.05 acre) located within the permanent ROW on the flowage easements between HDD boxes. However, much of the forest and PFO wetlands in the vicinity of the Project area have already been fragmented by agricultural activities, roads, and other commercial or industrial developments. Further, construction of the proposed Project facilities would not result in the permanent loss of wetland features. Although trees within a 30-foot corridor centered on the pipeline that could compromise the integrity of the pipeline coating would be selectively removed throughout the operational life of the Project, this portion of the PFO wetland impacted by proposed Project would be converted to PEM or PSS and allowed to revegetate with scrub-shrub or herbaceous species. Therefore, further fragmentation of wetlands or creation of new forest-edge habitat as a result of the Project would be negligible.

Regionally, the greatest impact to the native vegetative community is associated with past and current agricultural practices. Pipeline projects, however, impact a relatively small area in relation to the total landscape, as these impacts are typically short in duration and temporary in nature. Examples of impacts to vegetation, agriculture, and range resources could include introduction of non-native plants and/or noxious weeds, habitat fragmentation, decreased vegetative structure, reduced populations below critical threshold levels, sedimentation or degradation of surface waters, erosion, and siltation. However, the implementation of BMPs outlined in the SWPPP (**Appendix A**) and ECP (**Appendix G**) and reclamation of disturbed areas with native vegetation would reduce the chances of adverse individual or cumulative impacts. In addition, while other projects' pipeline corridors may require clearing of forested areas and potential habitat fragmentation, temporary workspace areas would be able to revegetate upon completion of construction. Further, these projects would be located in a region of North Dakota that is dominated by open or agricultural land, thereby minimizing the potential for permanent habitat fragmentation.

4.4 Threatened, Endangered, Candidate, and Proposed Species

As required by the Endangered Species Act, the status of each species listed as threatened or endangered is evaluated every 5 years by USFWS to assess its recovery and determine if a change in its listing status is warranted. Where available, these documents were utilized to identify the potential for ongoing regional oil and gas development to significantly threaten the species listed in the Project area. For species in which a 5-Year Review was not available, Dakota Access utilized the species Recovery Plan and/or Final Rule to evaluate potential threats on the species resulting from regional oil and gas development.

Species for which no suitable habitat is present in the Project Area or Connected Action Area, such the as black-footed ferret, Dakota skipper, and gray wolf, were not evaluated, as the Project would not contribute to cumulative impacts on these species. Further, the northern long-eared bat was not evaluated since the species is not provided federal protection in the Project Area or Connected Action Area under the Interim 4(d) Rule; this area is well outside of the published White-Nose Syndrome Buffer Zone.

Habitat loss and modification are the primary threats to the continued existence of pallid sturgeon, interior least tern, rufa red knot, whooping crane, and piping plover. The potential cumulative impacts from oil and gas activities in the region on the current listing or potential elevated future listing of these five species are discussed in detail below.

The USFWS (2014c) Revised Recovery Plan for the Pallid Sturgeon (*Scaphirhynchus albus*) specifically addresses the potential effects of energy development such as oil and gas pipelines on pallid sturgeon. It states that while a rupture of a pipeline within sturgeon habitat could pose a threat, the impacts would be localized and the magnitude of the impact would be dependent on the quantity and timing of the material released. It is highly unlikely that a cumulative impact resulting from a spill or leak would occur, as it would require multiple pipelines in the same general area to experience anomalous events simultaneously. Even if this were to occur, these impacts would be localized and temporary and would likely not result in a significant impact on the recovery of pallid sturgeon, as a whole.

According to the Final Rule (79 FR 73706) for the rufa red knot (USFWS, 2014b) and the USFWS (2007) International Recovery Plan for the Whooping Crane (*Grus americana*), the USFWS considers oil and gas activities as a secondary threat, especially near the coast (primarily in southeast Texas in the wintering range). Potential threats to these species along the Central Flyway migratory route in the region of the Project include loss of stopover habitat from conversion of natural wetlands (e.g., prairie potholes) to croplands and development (including oil and gas exploration). The Project would not result in any loss of stopover habitat for either the whooping crane or rufa red knot; therefore, it would not contribute to cumulative impacts on either species as result of regional oil and gas activities.

The USFWS does not address oil and gas activities, including potential spills, as a potential or ongoing threat to the interior least tern in either the 5-year review, or the recovery plan (USFWS, 2013e). The primary threat to interior least terns and the cause of the initial population declines resulted from river channelization, impoundments, and changes in river flow resulting in loss of suitable habitat throughout their range.

The USFWS (2009) 5-Year Review for the piping plover does specifically address threats from oil and gas activities in North Dakota. However, impacts from oil and gas activities that are threatening piping plover are associated with the development of oil and gas exploration wells located near the alkali lakes habitat, which accounts for 83% of the U.S. Northern Great Plains piping plover breeding habitat. The Proposed Action is not located within the vicinity of any of these areas and would therefore not contribute to cumulative impacts on piping plovers resulting from oil and gas activities.

Based on the pipeline route, and the utilization of HDDs, the proposed Project is not likely to impact any habitat utilized by listed species, including aquatic species as discussed in Section 4.2. The co-location of utilities in established corridors, the proper implementation of erosion control devices, compliance with

permits issued for regulated activities, and rapid, thorough, and environmentally appropriate reclamation efforts are industry standards that, when applied consistently, on a regional basis, would minimize cumulative impacts now and in the future.

4.5 Wildlife Resources

Regionally, the greatest impacts to wildlife (past, present or future) can be associated with agricultural development. Agricultural land use replaced the existing natural diversity with the monoculture row crops. The practice also introduced noxious weeds, soil pests, and other exotics, which all had significant cumulative impacts on regional wildlife. Relative to the habitat and land use impacts associated with past agricultural activities, the proposed Project impacts (as well as those associated with the oil and gas industry on a regional basis) would be nominal. This is due to the short duration and small scale of the proposed Project relative to the regional landscape and the large scale of agricultural activities in the region.

The Project would not permanently alter the character of the majority of available habitats as most Project-related impacts are expected to be temporary (see Section 4.3 for a discussion of vegetation impacts associated with the Project and the Dakota Access Project as a whole). Possible temporary, short-term impacts on wildlife as result of the Project include the displacement of some mobile individuals to similar, adjacent habitats during construction activities. Further, while other oil and gas projects' pipeline corridors may require clearing of forested habitat (if present), once construction is complete, temporary workspace areas would be able to revegetate. In addition, the permanent easement would be allowed to revegetate with herbaceous species, which provides habitat to a variety of species that utilize herbaceous and edge habitats. When analyzed on a regional basis, these impacts do not change significantly in magnitude when compared to the current and historic impacts previously imposed upon the regional wildlife by agricultural development. Therefore, further habitat fragmentation as a result of the proposed Project or other oil and gas developments in the region would be negligible and is not anticipated to significantly contribute to cumulative effects on wildlife.

4.6 Land Use and Recreation

Regional oil and gas development and related activities could cause an impact to land use and recreation in the Project area. However, incremental increases are not anticipated based on the design of this Project and BMPs that would be implemented to restore the impacted area. Temporary impacts to land use would potentially occur during the period of active construction but areas would revert to preconstruction use following restoration, except for a small amount of land converted for aboveground facilities. Because construction would be short term and land use conversion would be minimal, the cumulative impact on land use as a result of the Project would be temporary and minor.

The flowage easement crossing would be located in an area with a greater density of prior development, while the Lake Oahe crossing would be located in an area with relatively little surface development. That said, since the proposed Project has been co-located with existing pipelines the additional impact incurred by the Project would be negligible if restored as proposed.

4.7 Cultural and Historic Resources and Native American Consultations

Dakota Access would implement measures to avoid or mitigate adverse effects to cultural resources that have been determined, in consultation with the federal land managing agencies, NDSHPO, and Native American tribes, to be eligible for listing in the National Register of Historic Places (NRHP). In areas where NRHP-eligible sites are mapped directly adjacent to workspace, Dakota Access would install exclusionary fencing along the outer workspace boundary during construction to prevent inadvertent trespassing by construction staff or vehicles. These areas would be classified generically as sensitive environmental areas, and would be closely monitored by Environmental Inspection (EI) staff. If an unanticipated discovery occurs during construction, Dakota Access would follow the measures described in its UDP (**Appendix F**).

Although the possibility of an unanticipated discovery is low based on the negative findings of the field survey efforts, the measures outlined in the UDP includes a thorough notification protocol which would ensure that the necessary cultural resources specialists and agency personnel are involved to appropriately address the nature significance and of the find. The Project is not anticipated to impact cultural resources; therefore, cumulative impacts associated with the Project would not occur.

4.8 Social and Economic Conditions

Construction of the overall DAPL Project would contribute more than $1 billion in direct spending just for materials – the majority of which would be purchased here in the U.S. Fifty-seven percent of the pipe, the majority of the valves, fittings, valve actuators, and the majority of the remaining materials would be manufactured in the U.S., creating significant opportunities for regional and national manufacturing. In addition to manufactured goods and services, the Project would provide $195 million in easement payments to the landowners whose property is crossed by the proposed pipeline.

The proposed Project would have a relatively short construction window with a small number of construction workers dedicated to the crossings. It is possible that nearby towns could experience short-term temporary increases to the local economy through induced spending from construction employees working on the crossings. No residential homes or farms would be relocated resulting from the proposed action. Additionally, no demographic changes in the Census tracts affected within the Project counties are anticipated because no permanent employees would be created as a result of the proposed Project. Therefore, the only indirect socioeconomic impacts from the Project are likely to be related to the temporary influx of workers, such as increased demand for housing and the secondary economic benefits discussed in Section 4.10.

The regional population has dramatically increased over the last seven year period due to oil and gas development; concentrated in the area of the flowage easement crossing. The majority of the current available and transient labor force in the region is involved in the exploration and production of the resources, or construction of related infrastructure, both of which are labor intensive efforts though temporary in nature. Well rigs are mobile and the number of available drilling leases is limited as well as the mineral resource itself. For these reasons the labor pool associated with the exploration and production of the resource are considered to be a temporary impact.

Regarding cumulative impacts to socioeconomic resources, the Project would minimally provide a benefit to local merchants and vendors as well as providing potential temporary employment opportunities to the local workforce. As such, no substantive negative direct, indirect, or cumulative impacts to socioeconomic resources would result from the Proposed Action.

4.9 Transportation and Traffic

As discussed in Section 3.3, roads throughout North Dakota have received a sharp increase in truck traffic due to increased oil and gas activity. The greater amount of traffic has led to a decline in the transportation infrastructure and a decrease in road safety throughout the state. Additional oil and gas development and production may continue to contribute to cumulative effects on roads in the vicinity of the Project Area requiring a higher frequency of road maintenance and repair on public roadways.

Construction of the project would temporarily increase traffic in the immediate vicinity of the Project Area. This increase in traffic would be temporary and is not expected to result in significant impacts to North Dakota's transportation infrastructure. Road improvements such as grading would be made as necessary and any impacts resulting from Dakota Access's use would be repaired in accordance with applicable local permits. Traffic interruptions would be minimized to the extent practical and would result in insignificant, temporary cumulative impacts on regional transportation resources as it would be localized to the immediate vicinity of the Project Area and major delivery routes.

During operations of the Project, there is expected to be a positive effect on traffic resources in North Dakota. Once in operation, DAPL plans to transport 450,000 bpd of crude oil via pipeline which would significantly reduce the demand for the commercial trucking of crude oil on county, state and interstate highways. It is anticipated that the cumulative effects of the Project and other future pipeline projects would be beneficial to the transportation infrastructure in North Dakota by decreasing oil hauled by truck traffic and therefore reducing wear and tear on roads and highways.

4.10 Environmental Justice

The proposed Project is being co-located with existing utilities and across USACE easements and fee owned property. Additionally, the holders of the mineral rights and landowners in the Project area have witnessed a recent windfall from the oil and gas developments in the region. For these reasons, we conclude that no substantive cumulative impacts to minority or low-income populations would result from the proposed Project.

4.11 Air Quality and Noise

No operation emissions are associated with the Project activities, as no major aboveground facilities would be constructed in these areas. Potential cumulative impacts on air quality would result from concurrent construction of the Project and other development projects in the region. Impacts on air quality associated with construction of the Project would be temporary and short-term; therefore, even if construction of other projects were concurrent with this Project, cumulative construction-related air quality impacts would be negligible. .

Construction of the Project, including aboveground facilities, would affect ambient noise levels at some nearby residences during active construction. The noise impact of the pipeline construction would primarily originate from the HDD equipment and would be highly localized to the HDD entry and exit sites. However, because the duration of Project construction would be temporary, the contribution of the Project to cumulative impacts on noise would be negligible.

5.0 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As required by NEPA, any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented, must be addressed in the EA. Irreversible commitments of resources result in a loss of future options. Commitments of resources which are irreversible are those resources which are destroyed or consumed and are neither renewable nor recoverable for use by future generations. Examples of irreversible commitments of resources include consumption of petroleum-based fuels or minerals and destruction cultural resources. Irretrievable commitments of resources result in a loss of productivity. Commitments of resources which are irretrievable occur when the productive use or value of a renewable resource is lost for a period of time. For example, timber or soil productivity may be lost for a period of time resulting in an irretrievable loss of production, but the action is reversible.

Construction activities associated with the Project would result in the consumption of materials such as aluminum, steel, other metals, wood, gravel, sand, plastics, and various forms of petroleum-based fuels, the use of which would constitute an irreversible commitment of resources. Most of these materials are nonrenewable and would be irreversibly committed if not recycled or reused during maintenance or at the end of the life of the Project.

Areas of vegetation removal or conversion along the permanent right-of-way, such as areas where trees or shrubs were established prior to construction but would be maintained in an herbaceous state during operation, would represent an irretrievable commitment of resources. Additionally, erosion, compaction, or an overall loss of soil productivity could occur if these impacts are not properly mitigated. Use of water for dust control and hydrostatic testing would also be irretrievable. Other irretrievable commitments of resources could occur if areas temporarily impacted by construction were not restored.

Overall, there would be a very minimal commitment of irreversible and/or irretrievable resources as a result of this Project since the majority of impacts would be temporary and would occur within agricultural land. Additionally, irreversible and/or irretrievable commitments of resources would be minimized through the mitigation measures for the affected environments identified throughout this EA.

6.0 MITIGATION SUMMARY

Dakota Access has selected the Proposed Action to minimize impacts to natural/cultural resources. System and routing alternatives were considered for the entire DAPL Project in order to meet purpose and need, design criteria and construction requirements, while minimizing potential impacts to the existing environment and socioeconomic setting. Impacts to the environment would be temporary and not significant as a result of avoiding, minimizing and mitigation any potential impacts. The majority of potential impacts would be mitigated by HDD technology which would bore beneath resources and allow pipeline construction to proceed with the least amount of impacts possible. Dakota Access has would also implement general mitigation measures such as those described in the ECP. The ECP has been developed based on decades of experience implementing BMPs during construction in accordance with generally accepted industry practices for linear infrastructure and cross-county pipelines. It is intended to meet or exceed federal, state, and local environmental protection and erosion control requirements, specifications and practices. The ECP describes current construction techniques and mitigation measures that would be employed to minimize the effects of construction on environmental resources. Some of the basic procedures identified in the ECP are listed below:

- BMPs designed to minimize the effects of construction on environmental resources;
- Temporary and permanent erosion and sediment control measures;
- Soil handling procedures designed to preserve the integrity of the soil (e.g., topsoil segregation, decompaction, etc.);
- Wetland and waterbody crossing and stabilization procedures
- Wildlife and livestock mitigation measures
- Restoration and revegetaion procedures
- Refueling and waste management procedures
- Weed management procedures
- Winter construction practices
- Stormwater management procedures

Dakota Access incorporates environmental requirements into all construction specifications and the ECP would be included in contract documents and enforced as such throughout the proposed action. The construction contractor(s) must comply with all applicable permits and plans during all phases of construction. In addition to the ECP, the Proposed Action would be constructed in accordance to the measures detailed in Dakota Access' SWPPP, SPCCC, HD Construction Plan, HDD Contingency Plan, and UDP.

To further ensure compliance with permits, plans, obligations, and commitments, Dakota Access would have full-time EIs to monitor construction and compliance. The EIs would be responsible for observing construction activities to verify that work is carried out in accordance with environmental permit requirements and ensure that designed avoidance and mitigation measures are properly executed during construction.

No additional mitigation measures were identified for geology and soils; water resources; vegetation, agriculture, and range resources; wildlife resources; aquatic resources; land use and recreation; cultural and historic resources, social and economic conditions; environmental justice; or air and noise. General

mitigation measures, as described in sections 3.1 through 3.7, or avoidance associated with the trenchless installation (i.e., HDD or bore) of the proposed pipeline are expected to mitigate adverse impacts to resources.

7.0 FEDERAL, TRIBAL, STATE, AND LOCAL AGENCY CONSULTATION AND COORDINATION

The following is a listing of all individuals and agencies consulted during preparation of the EA regardless of whether a response was received. On March 30, 2015, Dakota Access sent letters to interested parties (indicated by the Corps) requesting comments on the federal actions associated with crossing Corps flowage easements and Corps owned and managed federal land. A sample request for comment letter sent to individuals and agencies consulted, along with the mailing list and comments received, is included in **Appendix J**. **Appendix K** contains the Notice of Availability of the Draft EA for comment. **Table 7-1** includes a summary of agency personnel consulted.

Table 7-1
Agency/Entity Consultation List

Agency/Entity	Name	Address	Date Received/ Relevant EA Section
American Rivers	Kristen McDonald	1101 14th Ave. NW STE 1400 Washington, DC 20005-5637	Pending
Bureau of Indian Affairs - Fort Berthold Agency	Howard Bemer	PO Box 370 New Town, ND 58763	Pending
Bureau of Indian Affairs - Great Plains Regional Office	William Benjamin	115 Fourth Avenue S.E. Aberdeen, SD 57401	Pending
Bureau of Indian Affairs- Fort Berthold Agency	Earl Silk	P.O. Box 370 New Town, ND 58763	Pending
Bureau of Indian Affairs- Standing Rock	Robert Demery	P.O. Box E Fort Yates, ND 58538	Pending
Bureau of Land Management	Rick Rymerson	99 23rd Avenue West, Suite A Dickinson, ND 58601	Pending
Dakota Prairie Grasslands	Dennis Neitzke	1200 Missouri Ave Bismarck, ND 58504	Pending
Dakota Resource Council	Mark Trechock	P.O. Box 1095 Dickinson, ND 58601	Pending
Bismarck-Mandan Development Association	Brian Ritter	400 East Broadway Avenue, Suite 417 Bismarck, ND 58501	Pending
Morton County Commissioners	Dawn Rhone	210 2nd Ave NW Mandan, ND 58554	Pending
Morton County Extension Agent	Kari Presler	210 2nd Ave NW Mandan, ND 58554-3158	Pending
Morton County Weed Board	Wayne Carter	2916 37th St. NW Mandan, ND 58554	Pending
Emmons County Commissioners	Marlys Ohlhauser	P.O. Box 129 Linton, ND 58552	Pending
Emmons County Extension Agent	Connie Job	Courthouse, Box 278 Linton, ND 58552-0278	Pending
Emmons County Weed Board	Sam Renschler	510 Sampson Ave. Linton, ND 58552	Pending

Table 7-1 Agency/Entity Consultation List			
Agency/Entity	**Name**	**Address**	**Date Received/ Relevant EA Section**
Williams County Commissioners	Beth Innis	205 East Broadway PO Box 2047 Williston, ND 58802-2047	Pending
Williams County Extension Agent		302 East Broadway PO Box 1109 Williston, ND 58802-1109	Pending
Williams County Weed Board	Jim Basaraba	109 Main St Williston, ND 58801-6018	Pending
National Audubon Society State Office	Genevieve Thompson	118 Broadway, Suite 512 Fargo, ND 58102	Pending
Natural Resources Conservation Service	Kyle Hartel	PO Box 583 Watford City, ND 58854	Pending
Natural Resources Conservation Service	Michele R. Doyle	2540 Overlook Lane Mandan, ND 58554-1593	Pending
Natural Resources Conservation Service	Jennifer M. H. Vetter	318 Broadway St. S Linton, ND 58552-7612	Pending
Natural Resources Conservation Service	David Schmidt	1106 West 2nd St Williston, ND 58801-5804	Pending
NDSU Dept of Soil Science-Department Chair		NDSU Dept 7680 PO Box 6050 Fargo, ND 58108-6050	Pending
North Dakota Council of Humane Societies	Leo Keelan	1948 Anderson Drive Minot, ND 58701	Pending
North Dakota Department of Health	Peter Wax	600 East Boulevard Bismarck, ND 58505	Pending
North Dakota Farm Bureau		4900 Ottawa Street Bismarck, ND 58503	Pending
North Dakota Forest Service	Larry Kotchman	307 1st Street East Bottineau, ND 58318-1100	April 22, 2015/ Section 2.0 and Section 3.5
North Dakota Game & Fish Department	Steve Dyke	100 N. Bismarck Expressway Bismarck, ND 58501-5095	Pending
North Dakota Game & Fish Department	Dave Fryda	406 Dakota Ave Riverdale, ND 58565	Pending
North Dakota Game & Fish Department	Bruce Kreft	100 North Bismarck Expressway Bismarck, ND 58501-5095	Pending
North Dakota Game & Fish Department	Kent Luttschwager	13932 West Front Street Williston, ND 58801-8602	Pending
North Dakota Game & Fish Department	Fred Ryckman	406 Dakota Ave Riverdale, ND 58565	Pending
North Dakota Game & Fish Department	Terry Steinwand	100 North Bismarck Expressway Bismarck, ND 58501-5095	Pending

Table 7-1 Agency/Entity Consultation List			
Agency/Entity	**Name**	**Address**	**Date Received/ Relevant EA Section**
North Dakota Industrial Commission - Oil and Gas Division	Lynn Helms	600 East Boulevard Bismarck, ND 58505	April 16, 2015/ Section 3.1.2, Section 3.1.3, and Section 3.1.4
North Dakota Industrial Commission - Oil and Gas Division	Bruce E. Hicks	600 East Boulevard Bismarck, ND 58505	Pending
North Dakota Land Department	Mike Brand	1707 North 9th St. P.O. Box 5523 Bismarck, ND 58506-5523	Pending
North Dakota Parks & Recreation Department	Kathy Duttenhefner	1600 East Century Avenue, Suite 3 Bismarck, ND 58503-0649	April 20, 2015/ Section 3.3.1, Section 3.4 and Section 3.5.
North Dakota Petroleum Council	Ron Ness	P.O Box 1395 Bismarck, ND 58502	Pending
North Dakota State Historical Society	Susan Quinnell	612 East Boulevard Ave. Bismarck, ND 58505	April 2, 2015/ Section 3.7.1
North Dakota State Water Commission	John Paczkowski	900 East Boulevard Ave. Bismarck, ND 58505-0850	Pending
North Dakota Tourism Division	Sarah Otte Coleman	P.O. Box 2057 Bismarck, ND 58502-2057	Pending
U.S. Army Corps of Engineers, Regulatory Office	Daniel Cimarosti	1513 12th St. SE Bismarck, ND 58504	Pending
U.S. Fish and Wildlife Service, North Dakota Field Office	Scott Larson	3425 Miriam Avenue Bismarck, ND 58501-7926	Pending
USDA-APHIS-WS	Philip Mastrangelo	2110 Miriam Drive, Suite A Bismarck, ND 58501	Pending
USDA-Natural Resources Conservation Service-North Dakota State Office	Mary Podoll	220 East Rosser Avenue, Room 270 Bismarck, ND 58502-5020	April 13, 2015/ Section 3.1.5 and Section 3.2.3
USDOI-Office of Surface Mining Reclamation and Enforcement-Dick Cheney Federal Building	Jeffrey Fleischman	P.O. Box 11018, 150 East B Street, Rm 1018 Casper, WY 82602	April 13, 2015/ Section 1.1
U.S. Army Corps of Engineers	Omaha District; CENWO-PM-AA	1616 Capitol Avenue Omaha, NE 68101-4901	Pending
North Dakota Parks & Recreation Department	Mr. Jesse Hanson	1600 E. Century Ave. Suite 3 Bismarck, ND 58503-0649"	Pending
North Dakota Chapter of the Wildlife Society	Mr. Kory Richardson	PO Box 1442 Bismarck, ND 58502	Pending

Table 7-1 Agency/Entity Consultation List			
Agency/Entity	**Name**	**Address**	**Date Received/ Relevant EA Section**
Sierra Club - North Dakota Office	Mr. Blaine Nordwall	311 East Thayer Ave Suite 113 Bismarck, ND 58501	Pending

8.0 STATUS OF ENVIRONMENTAL COMPLIANCE

Table 8-1 is a listing of environmental protection statutes and other environmental requirements, as well as the status of Applicant compliance with these statutes and requirements, regarding this EA.

Table 8-1
Environmental Permits, Approvals, and Consultations

Jurisdiction	Permit or Authorization	Status	Requirement or Action
Federal			
Corps	RHA, Section 10	Pending, Application Submitted Dec 2014	RHA, Section 10: Missouri River/Lake Oahe
Corps – Omaha District	Section 404 CWA	Pending, Application Submitted Dec 2014	NWP 12, Section 404 Waters with PCN
	Survey permission, geotechnical investigation	Received April 2015	Survey permission, geotechnical investigation
	Title 30 Rights-of-Way for pipelines through Federal Lands and Temporary Construction License	Pending	Real Estate Agreement and EA for Crossing the Missouri River/Lake Oahe (Fee title Lands on both sides of river/lake)
	Flowage Easement Consent to Cross	Pending	Consent to Cross
USFWS	Section 7 Endangered Species Act (ESA) Consultation	Pending	Compliance under 404 Permit NWP 12 Joint Application
Bureau of Reclamation	Letter of consent to cross irrigation works	Pending	BOR water conveyance facilities, near cities of Buford and Trenton, ND
State			
North Dakota Public Service Commission (NDPSC)	North Dakota Energy Conversion and Transmission Facility Siting Act: Certificate of Corridor and Route	Application Submitted December 2014	Siting Application, PU-14-842
North Dakota Department of Health	Section 401 Water Quality Certification	Pending	Automatic with NWP 12
	Hydrostatic Test Water Discharge Permit No. NDG07-0000	Application to be submitted Q4 2015	Obtain permit coverage prior to discharge

Table 8-1 Environmental Permits, Approvals, and Consultations			
Jurisdiction	**Permit or Authorization**	**Status**	**Requirement or Action**
	North Dakota Pollutant Discharge Elimination System (NDPDES) Construction Stormwater General Permit (NDR10-0000)	Application to be submitted Q3 2015	Obtain permit coverage

Table 8-2 provides a summary of the environmental mitigation measures discussed throughout this EA that Dakota Access has committed to as part of the Project design to avoid or minimize potential impacts on environmental and human resources throughout construction and operation activities.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
Geology and Soils	To protect the terrain of the Project Area and Connected Actions, Dakota Access would, to the extent feasible, restore the areas affected by pipeline construction to pre-construction contours and similar vegetation (excepting trees within approximately 15 feet of the centerline). Pre-construction and as-built surveys would be completed and provided to the Garrison Project.
	Although not anticipated, if blasting is found to be necessary, Dakota Access would follow procedures specified in its Blasting Plan (Appendix E).
	Dakota Access, in accordance with North Dakota One Call, would require that the construction contractor, prior to initiating any ground disturbance activities, identify all underground utilities to minimize the potential for encountering buried utility structures.
	Dakota Access has completed a geotechnical analysis of the flowage easement and federal land crossing sites to facilitate engineering and design, including selection of appropriate materials and construction methods to limit any environmental impacts attributable to landslides.
	The proposed pipeline would be designed and constructed to meet or exceed industry specifications, which would effectively mitigate the effects of fault movement, landslides, subsidence, and subsidence.
	In the event paleontological resources are discovered during construction, Dakota Access would implement measures outlined in its Unanticipated Discoveries Plan Cultural Resources, Human Remains, Paleontological Resources and Contaminated Media (UDP) (Appendix F) to avoid further impacts to these resources.
	If any vertebrate fossils are found during pipeline construction, Dakota Access would immediately cease construction activities and notify the appropriate agency personnel, including the North Dakota state paleontologist as well as the USACE archaeologist. The appropriate authorities would determine the significance of the find and prescribe the mitigation procedures to be completed prior to resuming pipeline construction.
	Dakota Access would minimize or avoid impacts on soils by implementing the mitigation measures described in the DAPL Project's SPCC, SWPPP, and ECP as well as requirements of applicable state and federal permits. These documents would be included as contract documents and enforced as such throughout the DAPL Project.
	To minimize potential impacts on soil productivity, topsoil would be separated during trench excavation in agricultural land, and if applicable, other areas where soil productivity is an important consideration. Unless otherwise requested by the landowner, topsoil in cropland would be removed to a maximum depth of 12 inches from the trench and spoil storage area and stored separately from the trench spoil. After the trench is backfilled, topsoil would be returned to its approximate original location in the soil horizon.
	Compaction of agricultural soils would be minimized by restricting construction activities during periods of prolonged rainfall. Where unacceptable levels of compaction occur in agricultural lands, a chisel plow or other deep tillage equipment would be utilized to loosen the soil.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Dakota Access would retain environmental inspectors (EIs) to monitor the contractor's compliance with applicable requirements to protect soil resources during construction of the DAPL Project. The Garrison Project would be notified if the EIs have concerns on the Project Area or Connected Action Area.
	The HDD workspace sites would be cleared, graded and matted as needed to minimize rutting and compaction.
	Permanent impacts to soils would be avoided through the application of BMPs during construction, restoration, and post-construction revegetation management, as outlined in the ECP (Appendix G).
Water Resources	Impacts to Lake Oahe and the Missouri River would be minimized by using HDD construction methods to install the proposed pipeline underneath the Missouri River and Lake Oahe.
	The HDD Contractor plans to install steel surface casing, where defined in the site specific HDD plans, to reduce the probability of an inadvertent release when the drill bit is working near the surface.
	The drilling mud and cuttings would be disposed of in accordance with applicable laws and regulations, likely in an existing landfill or by land farming.
	Dakota Access would conduct all HDD work according to the HDD Construction Plan (Appendix B) that it has prepared, and implement the HDD Contingency Plan (Appendix B) in the event of an inadvertent release.
	The Missouri River water withdrawal activity would comply with all applicable permit conditions and regulations, including the specifications on permitted intake structures outlined in the USACE's Regional Conditions for North Dakota applicable to Nationwide Permit 12 (Utility Line Activities). This regional condition requires that the applicant 1) utilize an intake screen with a maximum mesh opening of ¼-inch, 2) wire, Johnson-like screens must have a maximum distance between wires of 1/8-inch, 3) water velocity at the intake screen shall not exceed ½-foot per second, 4) intake structure shall be floating, and 5) at the beginning of pumping, the intake shall be placed over water with a minimum depth of 20 feet.
	The barge/float required for water withdrawal from the Missouri River would be fitted with a secondary containment structure, and the pump would be placed within this structure to contain accidental spills of fuels. The intake hose would be suspended by floats within the water column and screened to prevent impingement entrainment of foreign objects and aquatic species.
	Water discharges associated with hydrostatic testing on Corps flowage easements would be conducted in accordance with applicable permits. Hydrostatic test water discharges would not occur on Corps fee property.
	Dakota Access would conduct trench dewatering and hydrostatic test discharges in a manner consistent with the North Dakota Pollutant Discharge Elimination System (NDPDES) General Permit NDG-070000, as applicable.
	Discharged hydrostatic test water would not contain additives unless written approval is received from Dakota Access and applicable permits authorize such additives.
	Where appropriate, water would be discharged into an energy dissipation and/or filtering device as described in Dakota Access' SWPPP (Appendix A) to remove sediment and to reduce the erosive energy of the discharge.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Impacts to waterbodies would be minimized by conducting pipeline construction activities in accordance with applicable regulatory requirements and waterbody construction procedures described in Section 2.3.2.8 and the ECP.
	Fuel and all other hazardous materials would be stored in accordance with the requirements of Dakota Access' SPCC, SWPPP, and ECP. These documents also describe response, containment, and cleanup measures.
	EIs would monitor compliance with applicable waterbody protection requirements during construction of the facilities. The Project ECP (Appendix G) and SWPPP (Appendix A) describe additional mitigation measures and contains illustrations of how sediment control devices should be utilized.
	Dakota Access would maintain a vegetative buffer until the actual crossing of the waterbody takes place.
	Temporary sediment control measures, such as silt fence, would minimize the introduction of sediment into waterbodies during construction and minimize the movement of spoil and sediment from surface runoff during and after construction.
	Dewatering activities would be conducted in accordance with applicable permits and Dakota Access' SWPPP, and ECP.
	All surface drainage contours and vegetation would be returned as closely as practical to preconstruction conditions.
	The potential for groundwater contamination would be avoided by implementing the protective measures set forth in the Project specific SPCCs prepared by the contractor and in Dakota Access' SPCC Plan (Appendix A).
	In the event of a leak, Dakota Access would work aggressively to isolate the source through the use of remote-controlled shut-off valves, initiate cleanup activities, and contact the appropriate federal and state authorities to coordinate leak containment and cleanup. Dakota Access proposes to meet or exceed all applicable regulations and requirements for pipeline design, construction, and operation.
	Construction workspace on the flowage easements has been selected based on an absence of wetlands within the Project area.
	Dakota Access is in the process of obtaining verification for use of Nationwide Permit 12 for the crossings of both the Missouri River and Lake Oahe Section 10 waterbodies.
	The Project ECP and SWPPP specify several measures to protect wetlands and waterbodies from becoming polluted with fuels or other hazardous materials during construction. This plan prohibits the storage of fuel or other hazardous materials within 100 feet of a wetland or waterbody. The ECP also specifies that equipment must be refueled at least 100 feet from waterbodies unless, due to site-specific conditions, there is no practical alternative such as the proposed pumping intake structure located on the barge at the Missouri River Crossing. In that case, the contractor must implement site-specific protective measures and containment procedures described in the ECP. Contractors would be required to provide trained personnel, appropriate equipment, and materials to contain and clean up releases of fuel, lubricating oil, or hydraulic fluid that result from equipment failure or other circumstances.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	The Project has been designed in accordance with accepted floodplain management practices; no impacts to floodplain elevations or velocities are anticipated. Following construction, disturbed areas would be restored to pre-construction grades and contours as practical.
	If necessary, soil displaced by the installation of the 24-inch pipeline on the flowage easements would be removed from the floodplain and hauled to an upland location in order to ensure original floodplain elevations are restored.
	Remotely operated above-ground mainline valve sites would be installed on both sides of the Missouri River and Lake Oahe crossings for isolation in the event of an emergency shutdown.
	Impacts to cultivated crops make up the majority of temporary impacts and would return to cultivated crops post-construction.
	Within areas disturbed by construction of the Project, and not being actively cultivated, including the flowage easement Project Area, Dakota Access would implement active revegetation measures and rapid colonization by annual and perennial herbaceous species to restore most vegetative cover within the first growing season.
	In areas that require permanent revegetation, Dakota Access would specify 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 ATWS would be allowed to revegetate after construction depending on arrangements with the landowner.
	Temporary revegetation measures may also be implemented to quickly establish ground cover to minimize the potential for soil erosion and noxious weeds to establish. A temporary seed mix may be applied in these situations. The Project ECP (Appendix G) contains more details regarding temporary revegetation.
	When constructing in agricultural areas, a minimum of 1 foot of topsoil (organic layer) would be stripped from the trench line and stockpiled separately from trench spoil to preserve the native seed stock. The ECP contains additional details regarding topsoil segregation.
	At stream approaches, the contractor would leave a 20-foot buffer of undisturbed herbaceous vegetation on all stream banks during initial clearing, except where grading is needed for bridge installation or where restricted by applicable regulations and/or permit conditions.
	Dakota Access would work with County Weed Boards to ensure the Project ECP contains relevant and necessary mitigation measures that would be implemented to prevent the spread of noxious weed species during construction and operation of the Project.
	Herbaceous cover would be seeded on disturbed upland areas during restoration and it is expected that pre-existing herbaceous and shrub habitats would quickly reestablish themselves.
	In the unlikely event that a listed species is encountered on the Project at Corps owned lands during construction, construction activities would stop and the Corps would be contacted.

Table 8-2
Summary of Environmental Impact Avoidance and Mitigation Measures

Resource	Environmental Avoidance/Mitigation Measures
Wildlife Resources	Herbaceous cover would be seeded on disturbed upland areas during restoration and it is expected that pre-existing herbaceous and shrub habitats would quickly reestablish themselves.
	In the unlikely event that a listed species is encountered on the Project at Corps owned lands during construction, construction activities would stop and the Corps would be contacted.
	Installation and removal of the temporary waterline on the flowage easements are anticipated to be complete prior to nesting season; therefore, impacts on the interior least tern and piping plover are not anticipated. However, if the water withdrawal activities are not able to be completed prior to nesting season as expected, Dakota Access would conduct surveys prior to placement of the waterline to confirm the presence/absence of these species within the pipeline ROW. If these species are nesting within the Project Area, Dakota Access would postpone water withdrawal activities at the Missouri River until these species have left the area.
	Direct impacts on potentially suitable habitat for the interior least tern and piping plover at the Missouri River and Lake Oahe would be avoided by crossing the waterbodies via HDD.
	Lake Oahe would be crossed using a HDD construction method, avoiding impacts on potential migrating rufa red knot loafing habitat.
	Impacts on the pallid sturgeon or suitable habitat present within the Missouri River would be avoided by implementing the conditions on permitted intake structures outlined in the USACE's Regional Conditions for North Dakota applicable to Nationwide Permit 12 (Utility Line Activities) and as described in the USFWS Recovery Plan for the Pallid Sturgeon.
	Impacts on the pallid sturgeon or suitable habitat present within Lake Oahe would be avoided by crossing the lake via HDD.
Aquatic Resources	A successfully completed HDD crossing would avoid aquatic resource impacts to Lake Oahe since the pipeline would be installed without disturbing the aquatic and benthic environments.
	All HDD operations conducted for the Missouri River and Lake Oahe crossings would adhere to the HDD Contingency Plan and applicable permit conditions to reduce the likelihood of an inadvertent release to minimize and mitigate environmental impacts. Dakota Access' construction contractor would ensure that the appropriate response personnel and containment equipment are available onsite to effectively implement the HDD Contingency Plan.
	Water withdrawal activities at the Missouri River would be conducted in accordance with all applicable permit conditions and regulations and in a manner that would not reduce water flow to a point that would impair flow or impact aquatic life.
	Intake screens and floats would also be utilized during the withdrawal of water from the Missouri River to prevent entrainment of aquatic life and avoid impacts on aquatic resources.
	The potential for impacts on aquatic resources associated with accidental fuel spills or leaks during the withdrawal of water from the Missouri River would be avoided or minimized by placing the pump within a secondary containment structure on the barge.

Table 8-2
Summary of Environmental Impact Avoidance and Mitigation Measures

Resource	Environmental Avoidance/Mitigation Measures
	For portions of the pipeline installed beneath the lake, the depth of the pipeline profile, the increased wall thickness of the pipe, the installation of remotely operated valves on both sides of the river crossing, monitoring of the system 24/7, aerial patrols, and in-line inspection, would further limit the potential for an inadvertent release into the river.
	Adherence to the Geographic Response Plans for Lake Oahe and the Missouri River would minimize potential impacts on aquatic wildlife from potential spills during the operation of the pipeline.
	In the event of a leak, Dakota Access would work aggressively to contain the leak, initiate cleanup activities, and contact the appropriate authorities, including the Corps.
Land Use and Recreation	Mitigation measures to minimize impacts to soils, such as topsoil segregation and decompaction practices, would be fully implemented in accordance with the ECP and SWPPP.
	Dakota Access would coordinate with all landowners on acceptable methods for construction and restoration, including potential impacts to irrigated fields.
	Dakota Access would repair surface drains and drainage tiles disturbed during ROW preparation, construction, and maintenance activities.
	Dakota Access would repair or replace fences and gates removed or damaged as a result of ROW preparation, construction, or maintenance activities.
	Following construction and restoration, the work area would be restored and ranching would be allowed to continue over the operational ROW. Landowners would be compensated for temporary loss of land and lower yields. Grazing activities would return to normal after revegetation of the disturbed areas.
	Trees would be protected by Dakota Access in a manner compatible with the safe operation, maintenance, and inspection of the pipeline. Applicable regulations would be adhered to regarding tree and shrub removal from along the route.
	Dakota Access would obtain and comply with applicable state regulations, county permits, and zoning and land use regulations. Permits may include, but are not limited to, grade and fill permits, ditch crossing permits, road and utility permits, and conditional use permits. Dakota Access would retain one or more EIs to monitor compliance with environmental conditions of county permits.
Cultural and Historic Resources	In accordance with Section 106 of the NHPA, Dakota Access has made a good faith effort to identify significant historic properties within the Project area. Based on the result of these efforts, no properties consisted to be eligible, or potentially eligible for listing in the National Register of Historic Places (NRHP) would be adversely impacted by the proposed Project or Connected Action.
	Impacts to the NRHP-eligible BTIS (site 32WI1367) would be avoided via HDD to ensure the integrity of construction design for these historic-age features is preserved.
	HDD workspaces, as well as staging and stringing areas, would be positioned in excess of 100 feet beyond the mapped boundaries of the previously recorded cultural sites in the vicinity of the Lake Oahe crossing.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Dakota Access' UDP was developed (Appendix F) for use during all DAPL Project construction activities which describes actions that would be taken in the event of a previously unrecorded cultural resource site is discovered during construction activities. The UDP explicitly calls for work to stop until the correct authority or agency can be contacted and the find can be properly evaluated.
Social and Economic Conditions	No residential homes or farms would be relocated resulting from the proposed action.
	No demographic changes in the Census tracts affected are anticipated, because no permanent employees would be created as a result of the Proposed Action.
Hazardous Waste	In the unlikely event contamination is encountered during construction, the UDP (Appendix F) would be implemented to protect people and the environment and avoid or minimize any effects from unearthing the material.
	Any hazardous materials discovered, generated, or used during construction would be managed and disposed of in accordance with applicable local, tribal, state, and federal regulations. Should emergency response be required during construction, the contractor would have some of their own trained or contracted responders, and local response teams would be expected to assist.
	Dakota Access would comply with all applicable laws and regulations to abate or prevent pollution, such as the RCRA, and State hazardous waste management rules.
Reliability and Safety	All activities would be conducted in a safe manner in accordance with the standards specified in the OSHA regulations.
	To prevent pipeline failures resulting in inadvertent releases, Dakota Access would construct and maintain the pipeline to meet or exceed industry and governmental requirements and standards. Specifically, the steel pipe would meet PHMSA specifications under 49 CFR § 195, follow standards issued by the American Society of Mechanical Engineers, National Association for Corrosion Engineers and American Petroleum Institute (API).
	Dakota Access would maintain and inspect the pipeline in accordance with PHMSA regulations, industry codes and prudent pipeline operating protocols and techniques. The pipeline ROW would be patrolled and inspected by air every 10 days, weather permitting, but at least every three weeks and not less than 26 times per year, to check for abnormal conditions or dangerous activities, such as unauthorized excavation along the pipeline route.
	Dakota Access is currently drafting a Facility Response Plan, in accordance with 49 CFR 194, which details the procedures to be implemented in the event of an inadvertent pipeline release and would be in place prior to commencing transportation of crude oil.
	Following completion of construction and throughout operation of the Project facilities, the Operator and qualified contractors would maintain emergency response equipment and personnel at strategic points along the pipeline route.
	Contracts would be in place with oil spill response companies that have the capability to mobilize to support cleanup and remediation efforts in the event of a pipeline release. The operator would also coordinate with local emergency responders in preventing and responding to any pipeline related problems.
	A SCADA system would be utilized to provide constant remote oversight of the Project facilities.

Table 8-2 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	A Computational Pipeline Monitoring System (CPM) would be utilized to monitor the pipeline for leaks.
	LeakWarn is being tailored to the Project facilities, in accordance with PHMSA requirements, to monitor the pipeline for leaks.
Air Quality and Noise	To reduce the emission of criteria pollutants, fuel-burning equipment running times would be kept to a minimum and engines would be properly maintained.
	Dakota Access would mitigate noise impacts by limiting equipment running times and the duration of Project construction to the minimum amount necessary to complete the Project. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime).

9.0 LIST OF PREPARERS AND REVIEWERS

Dakota Access, in cooperation with the USACE Preparers, reviewers, consultants and Federal officials include the following:

Table 9-1
List of Preparers and Reviewers

Name	Title	Agency
Johnathan Shelman	Environmental Resource Specialist	Corps of Engineers, Omaha District
Brent Cossette	Natural Resource Specialist, Environmental Stewardship	Corps of Engineers, Omaha District
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Dennis Woods	Managing Partner	Perennial Environmental Services, LLC

10.0 ACRONYMS, INITIALS, AND ABBREVIATIONS

ANSI	American National Standards Institute
API	American Petroleum Institute
ATWS	Additional Temporary Workspace
BMP	Best Management Practice
bpd	barrels per day
BTIS	Buford-Trenton Irrigation System
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response Compensation and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
Company	Energy Transfer Company
CWA	Clean Water Act
DA	Department of the Army
dB	Decibels
Dakota Access	Dakota Access, LLC
DAPL	Dakota Access Pipeline
DOT	Department of Transportation
EA	Environmental Assessment
ECP	Environmental Construction Plan
ECD	Erosion Control Device
EI	Environmental Inspector
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance rate Maps
FPPA	Farmland Protection Policy Act
FRFM	Flood Risk and Floodplain Management Section

g	gravitational acceleration
GIS	Geographic Information System
HDD	Horizontal Directional Drilling
MSL	Mean Sea Level
NDPSC	North Dakota Public Service Commission
NDPDES	North Dakota Pollutant Discharge Elimination System
NDSHPO	North Dakota State Historic Preservation Office
NDPRD	North Dakota Parks and Recreation Department
NEPA	National Environmental Preservation Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NLCD	National Land Cover Dataset
NPDES	National Pollutant Discharge Elimination System
NPS	U.S. National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NRI	Nationwide Rivers Inventory
NSF	National Science Foundation
NWI	National Wetland Inventory
NWP	Nationwide Permit
NWSRS	National Wild and Scenic River System
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PEM	Palustrine Emergent
PFO	Palustrine Forested
PHMSA	Pipeline and Hazardous Materials Safety Administration
PL	Public Law
Project	Dakota Access Pipeline Project
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act

ROW	Right-of-Way
SPCC	Spill Prevention, Control and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
UDP	Unanticipated Discoveries Plan Cultural Resources, Human Remains, Paleontological Resources and Contaminated Media
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WEG	Wind Erodibility Group
WMA	Wildlife Management Area

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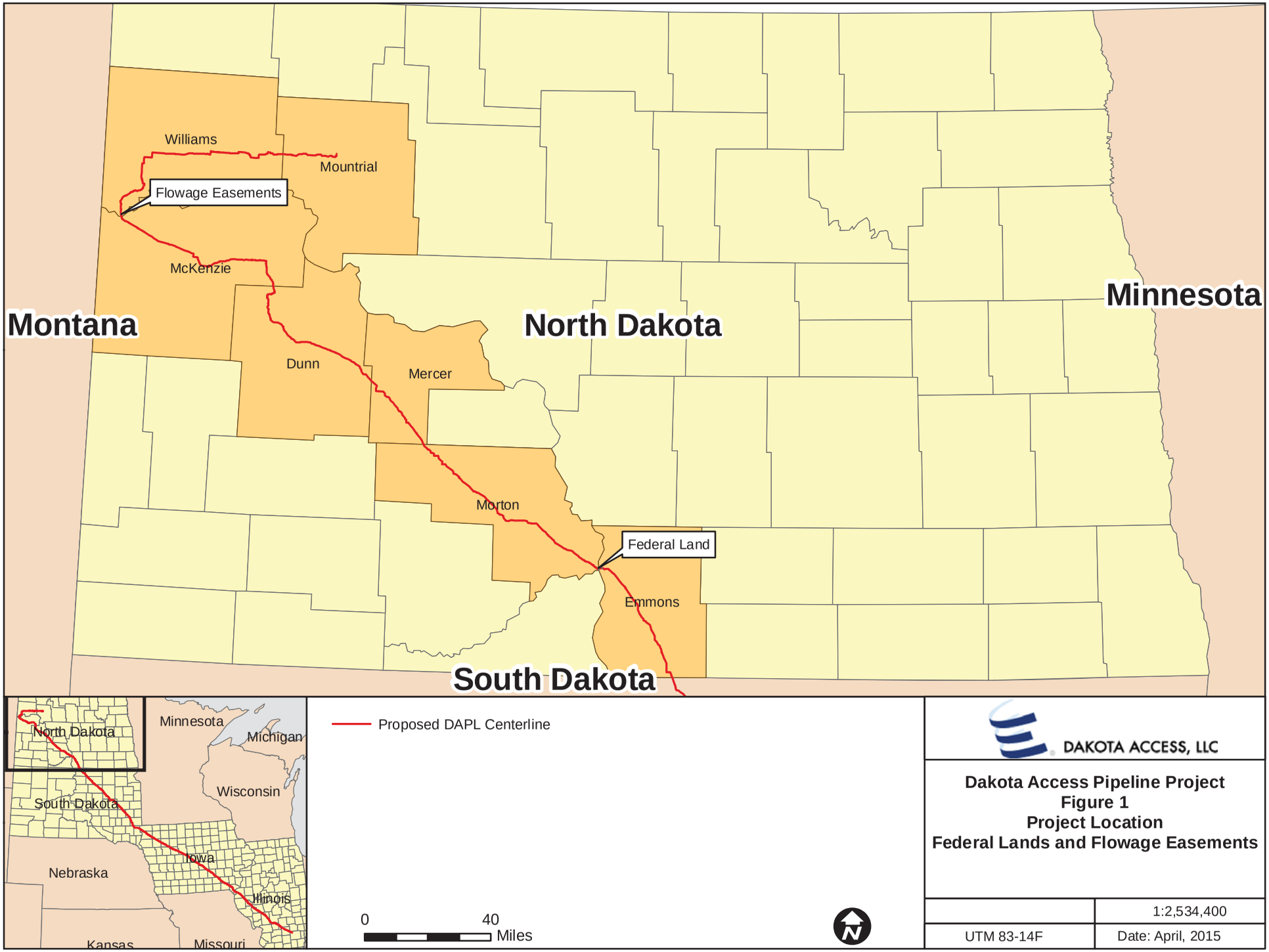
12.0 FIGURES



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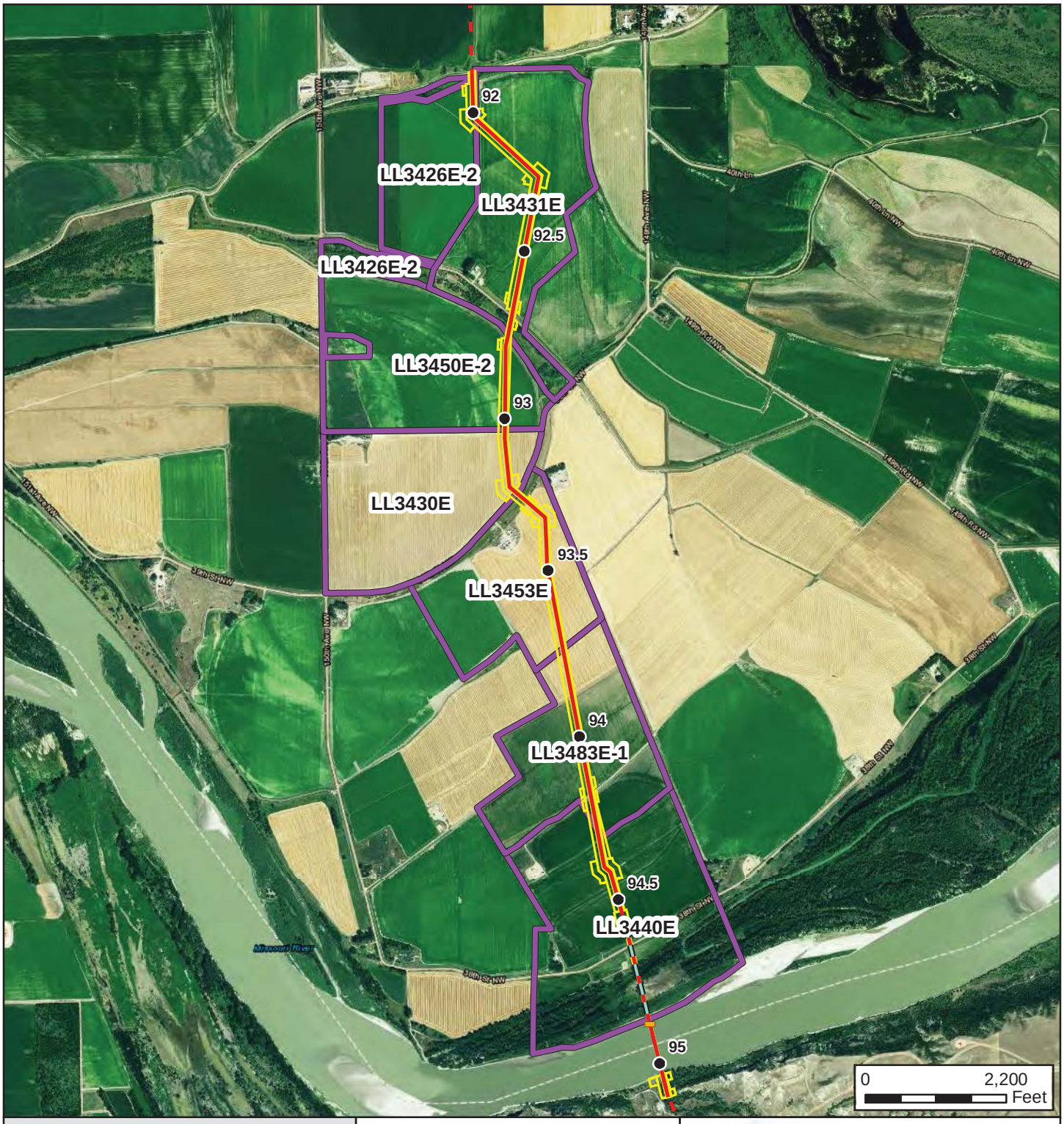

- Milepost
- Barge Location With Pumping Intake Structure*
- Temporary Above Ground Waterline
- Project Centerline
- DAPL Centerline
- Workspace
- USACE Flowage Easements

* Barge location dependant on water level

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 2
Project Layout
Flowage Easements
Williams County, North Dakoda

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UTM83-13F	Date: August, 2015

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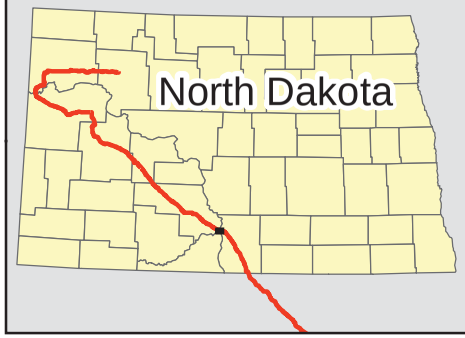

- Milepost
- Project Centerline
- DAPL Centerline
- Workspace
- USACE Federal Lands

0 1,750 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 3
Project Layout
Federal Lands
Morton County and
Emmons County, North Dakota

	1:21,000
UTM 83-14F	Date: April, 2015

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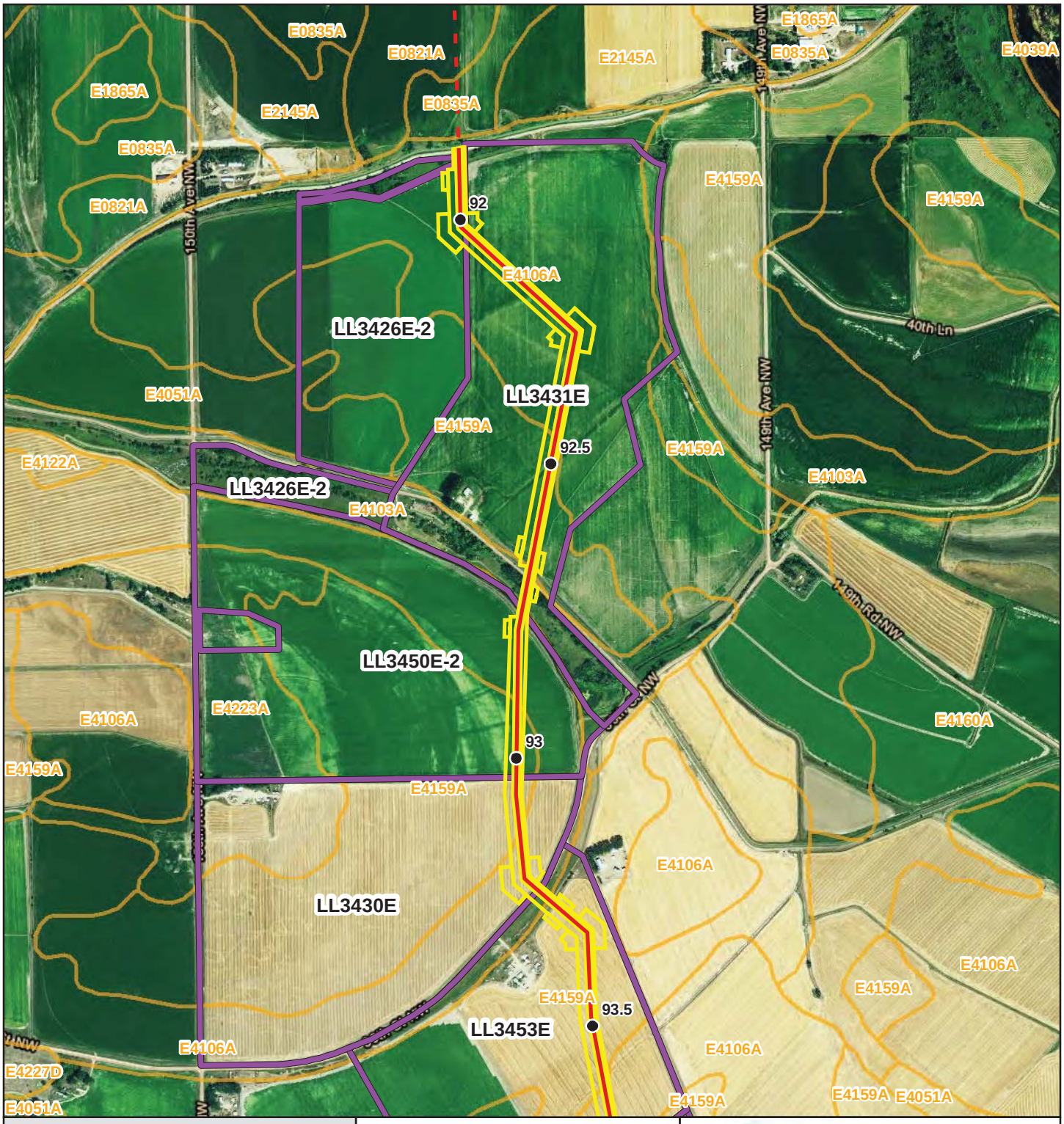

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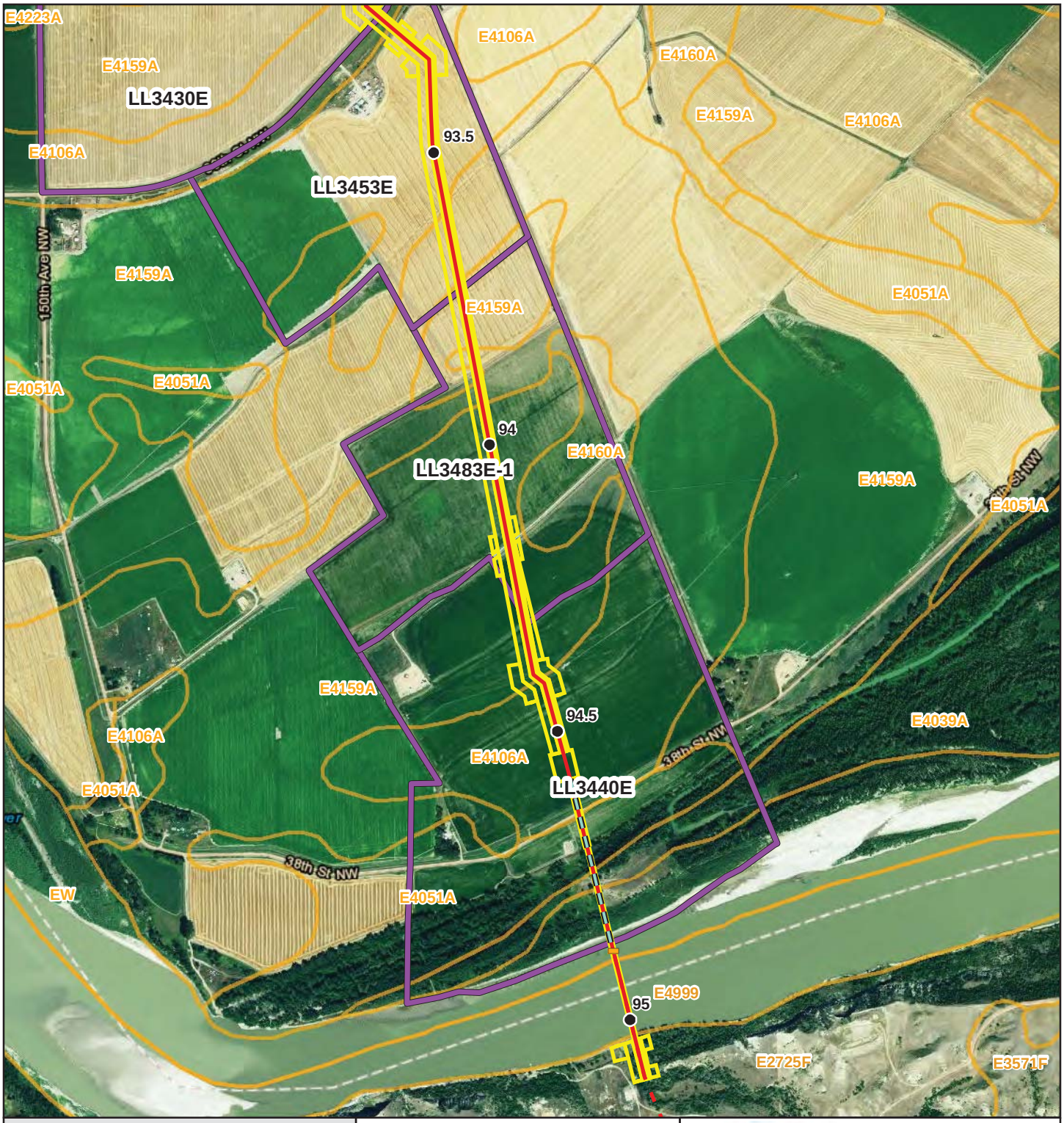

- Milepost
- Barge Location With Pumping Intake Structure
- Temporary Above Ground Waterline
- Project Centerline
- DAPL Centerline
- Workspace
- USACE Flowage Easements
- NRCS Soil

0 1,200 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 4-B
Soils
Flowage Easements
Williams County, North Dakota

Page 2 of 2	1:15,000
UTM83-13F	Date: August, 2015

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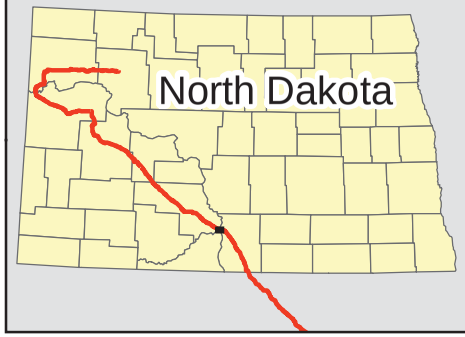

- Milepost
- Project Centerline
- DAPL Centerline
- Workspace
- USACE Federal Lands
- NRCS Soils

0 1,750 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 5
Soils
Federal Lands
Morton County and
Emmons County, North Dakota

	1:21,000
UTM 83-14F	Date: April, 2015

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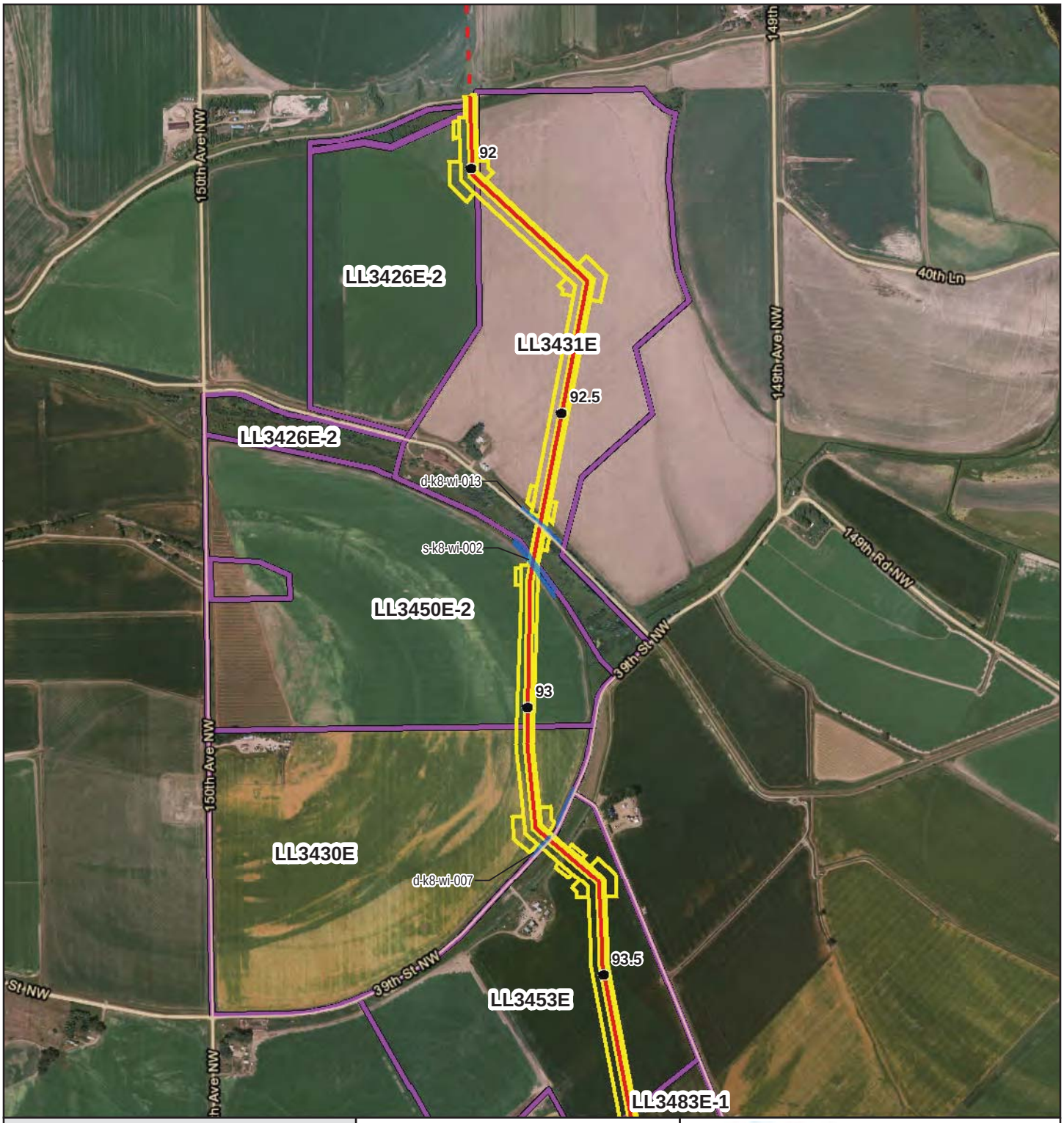

- Milepost
- Project Centerline
- DAPL Centerline
- Workspace
- Field Delineated Waterbody
- Field Delineated PEM Wetland
- Field Delineated PFO Wetland
- Field Delineated PSS Wetland
- USACE Flowage Easements

0 1,200 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 6-A
Natural Resources
Flowage Easements
Williams County, North Dakota

Page 1 of 2	1:15,000
UTM83-13F	Date: August, 2015

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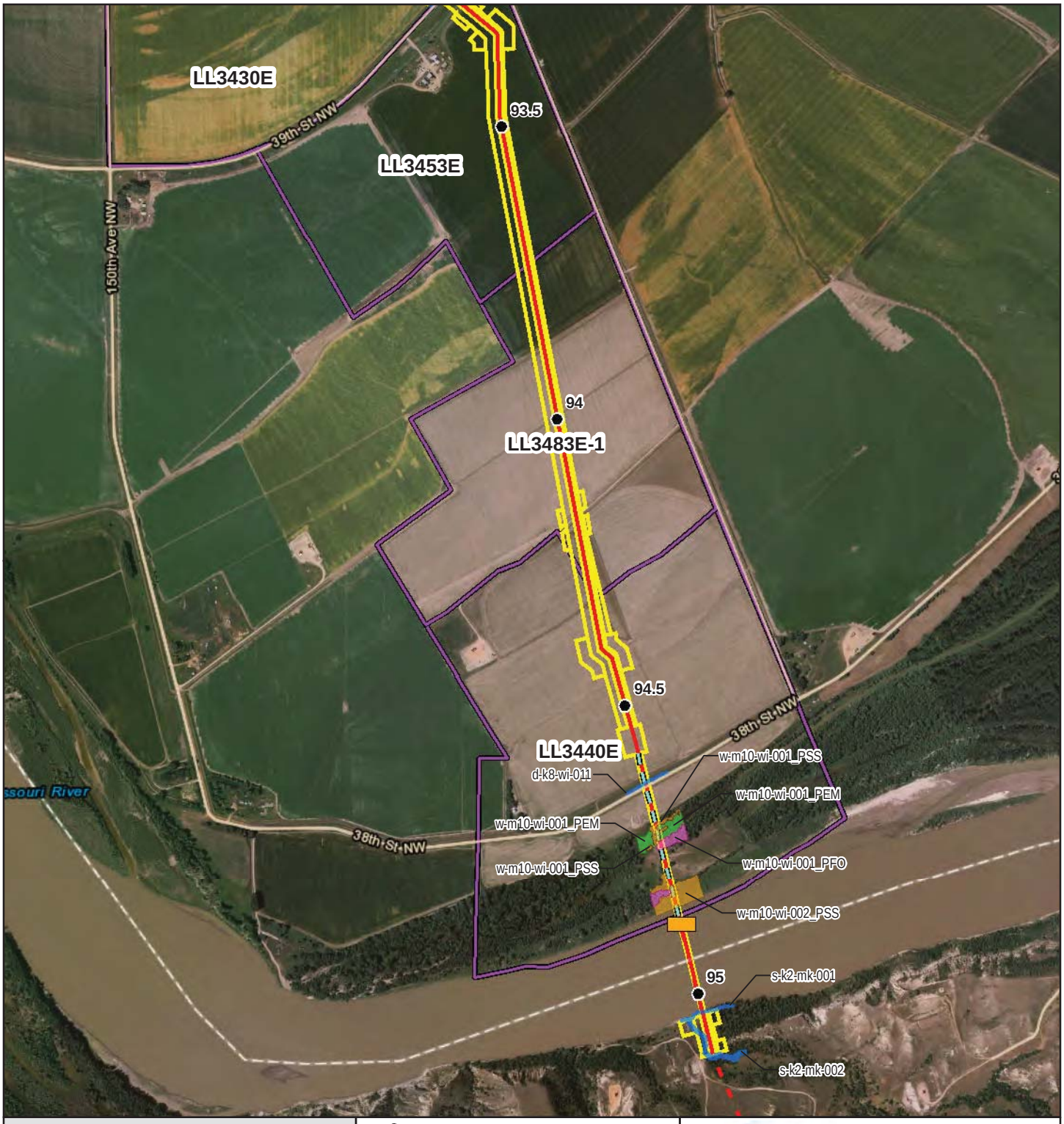

- Milepost
- Barge Location With Pumping Intake Structure
- Project Centerline
- DAPL Centerline
- Temporary Above Ground Waterline
- Workspace
- Field Delineated Waterbody
- Field Delineated PEM Wetland
- Field Delineated PFO Wetland
- Field Delineated PSS Wetland
- USACE Flowage Easements

0 1,200 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 6-B
Natural Resources
Flowage Easements
Williams County, North Dakota

Page 2 of 2	1:15,000
UTM83-13F	Date: August, 2015

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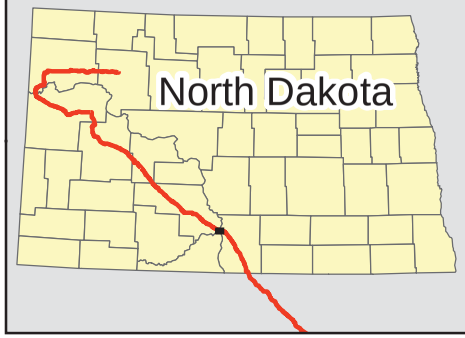

- Milepost
- Project Centerline
- DAPL Centerline
- Field Delineated Waterbody
- Workspace
- USACE Federal Lands

0 1,750 Feet

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Dakota Access Pipeline Project
Figure 7
Natural Resources
Federal Lands
Morton County and
Emmons County, North Dakota

	1:21,000
UTM 83-14F	Date: July, 2015

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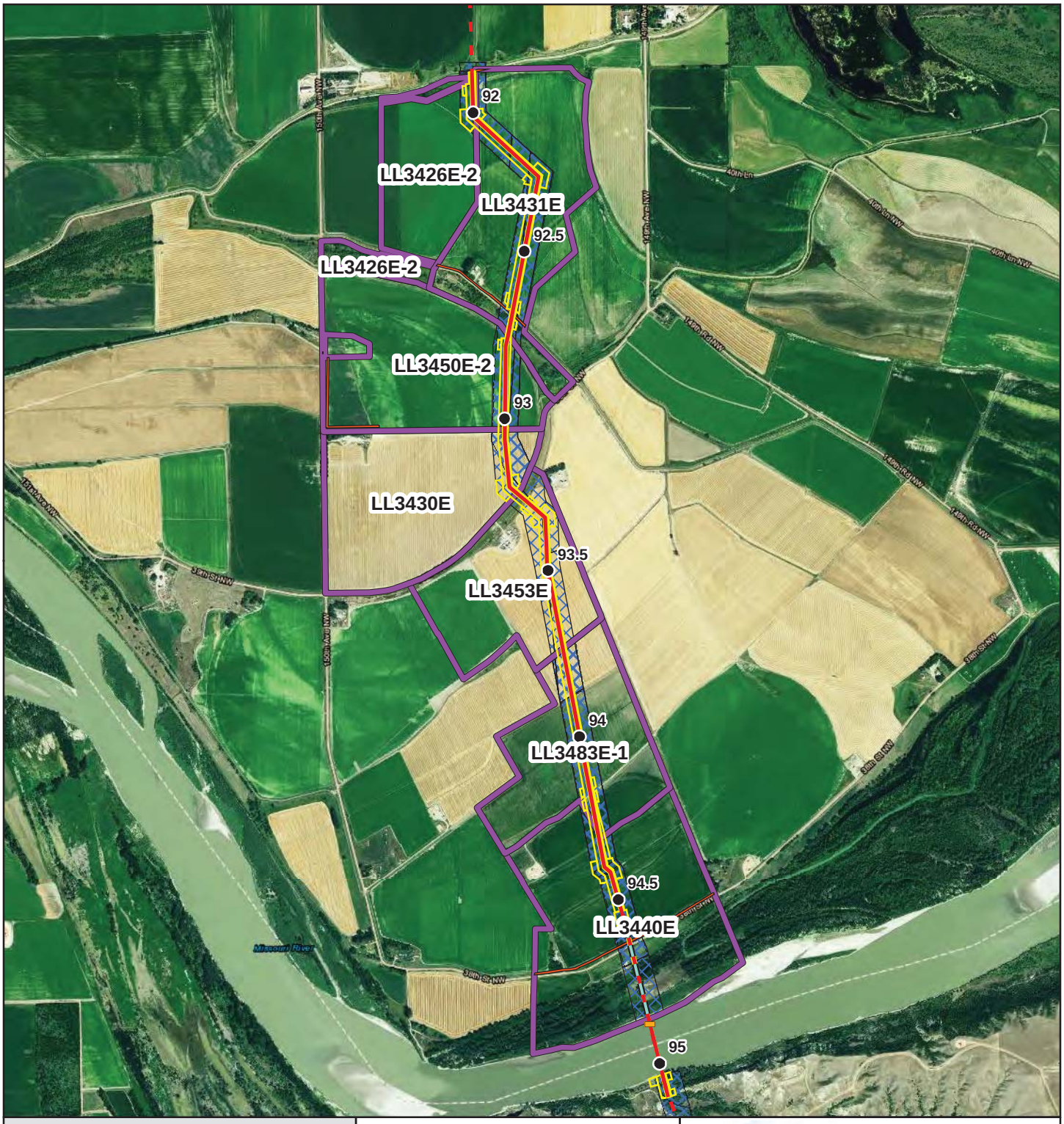

- Milepost
- Barge Location With Pumping Intake Structure*
- Temporary Above Ground Waterline
- Project Centerline
- DAPL Centerline
- Workspace
- Previous Surveyed Archaeological Sites
- USACE Flowage Easements
- Project Archaeological Survey

0 2,200 Feet

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Dakota Access Pipeline Project
Figure 8
Cultural Resources
Flowage Easements
Williams County, North Dakota

	1:26,400
UTM83-13F	Date: September, 2015

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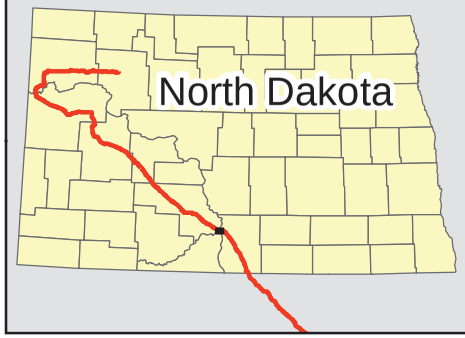

- Milepost
- Project Centerline
- DAPL Centerline
- USACE Federal Lands
- Project Archaeological Survey
- Previous Surveyed Archaeological Sites
- Workspace

0 1,750 Feet

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Dakota Access Pipeline Project
Figure 9
Cultural Resources
Federal Lands
Morton County and
Emmons County, North Dakota

	1:21,000
UTM 83-14F	Date: April, 2015

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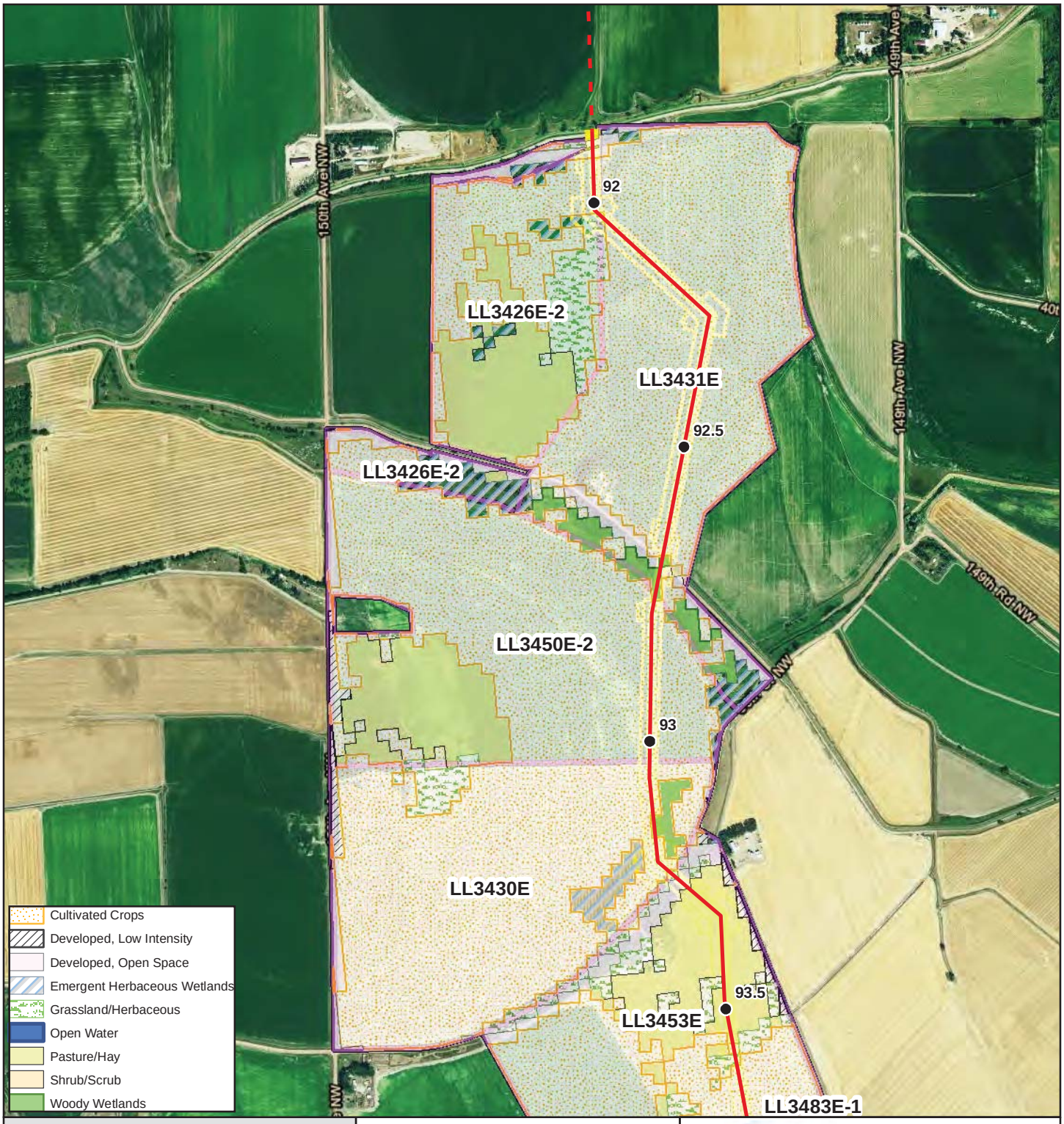

- Milepost
- Project Centerline
- DAPL Centerline
- Workspace
- USACE Flowage Easements

0 1,200 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 10-A
Landcover
Flowage Easements
Williams County, North Dakota

Page 1 of 2	1:15,000
UTM83-13F	Date: August, 2015

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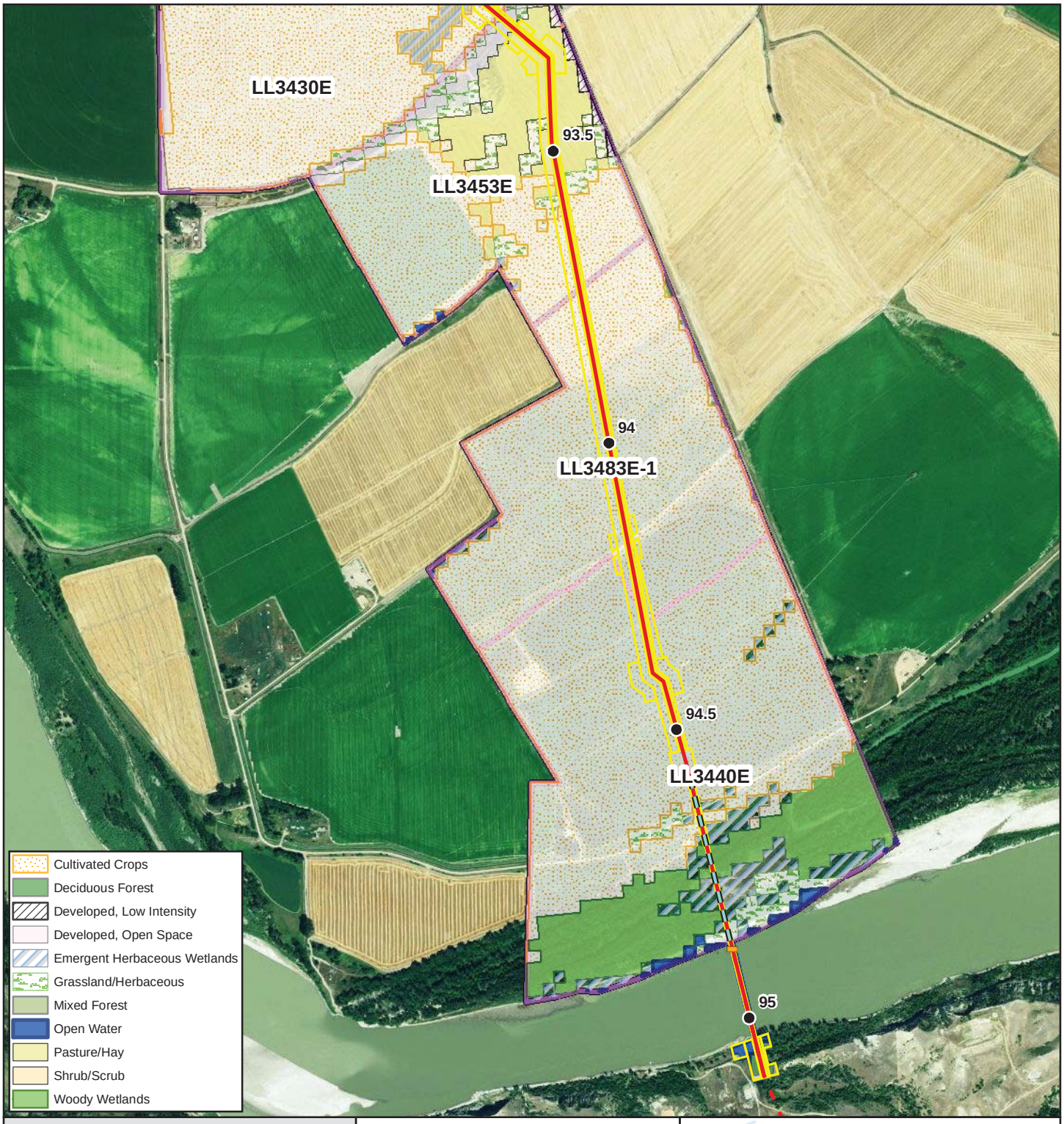

Barge Location With Pumping Intake Structure
Milepost
Temporary Above Ground Waterline
Project Centerline
DAPL Centerline
Workspace
USACE Flowage Easements

0 1,200 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 10-B
Landcover
Flowage Easements
Williams County, North Dakota

Page 2 of 2	1:15,000
UTM83-13F	Date: September, 2015

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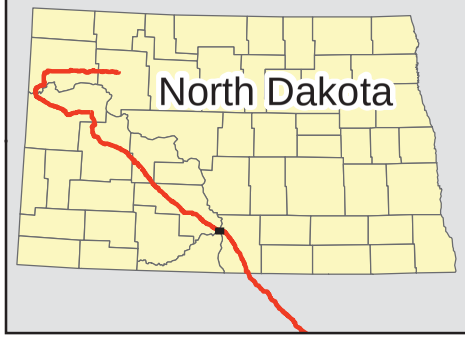

Milepost
Project Centerline
DAPL Centerline
Workspace
USACE Federal Lands

0 1,750 Feet

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 11
Landcover
Federal Lands
Morton County and
Emmons County, North Dakota

	1:21,000
UTM 83-14F	Date: April, 2015

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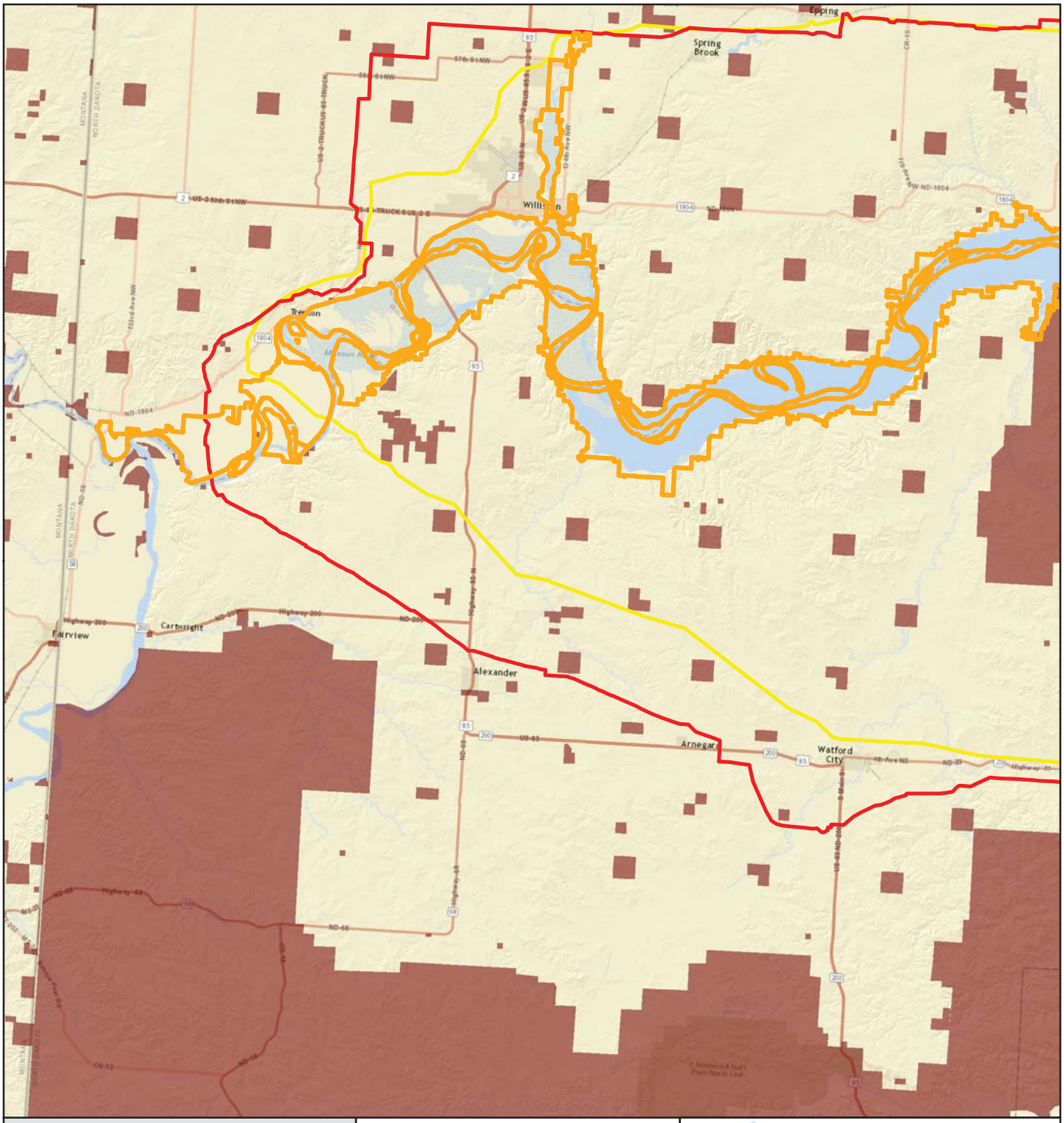

Preferred Alternative
Route Alternarive
USACE Garrison Flowage Easements
Other Government Lands

0 2 4 8 Miles

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 12
Route Alternative
Missouri River Crossing
Williams County, North Dakota

	1:400,000
NAD 1983 UTM Zone 14N	Date: July, 2015

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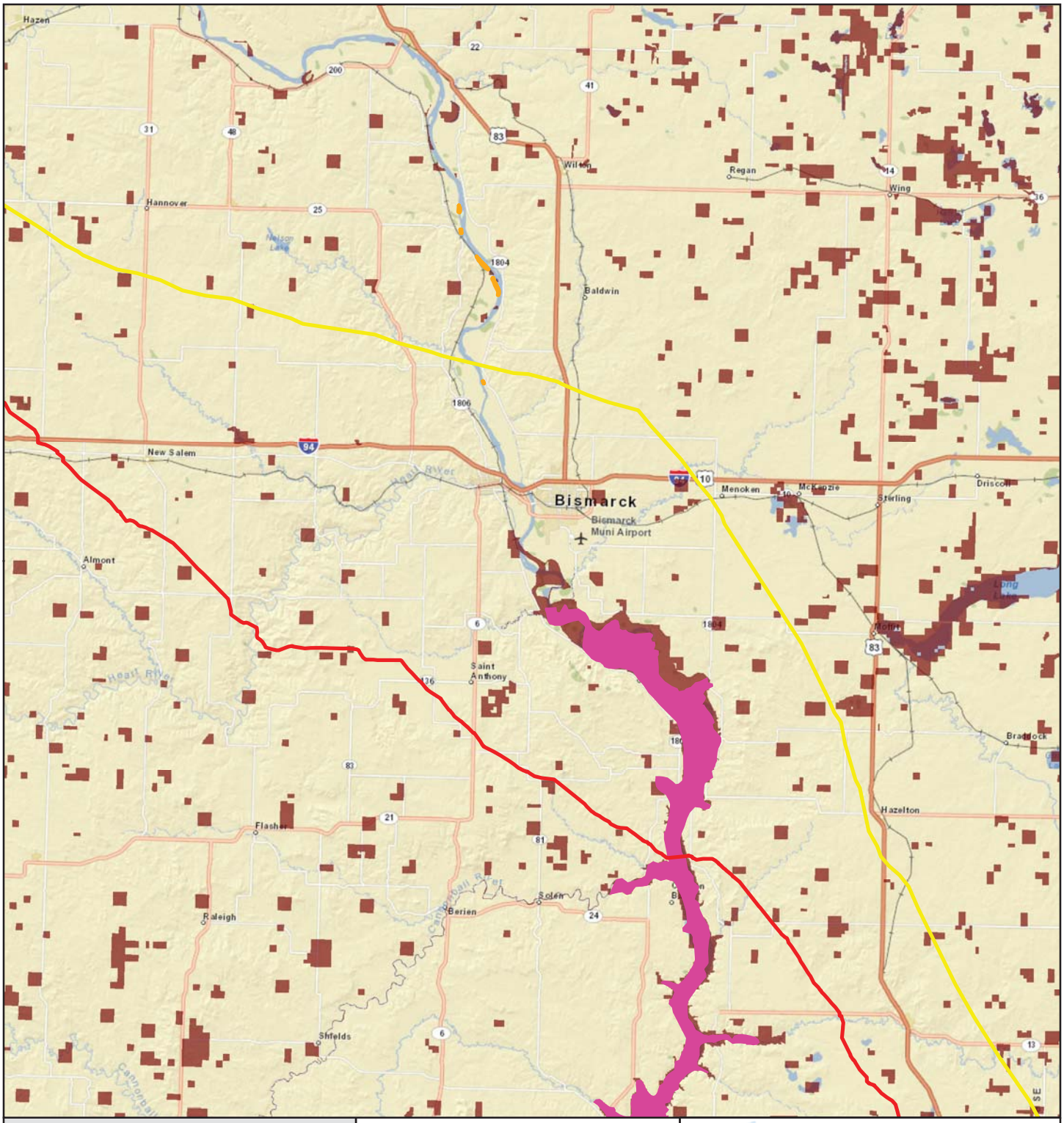

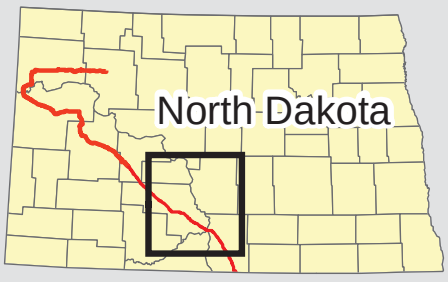

- Preferred Alternative
- Route Alternarive
- USACE Garrison Flowage Easements
- USACE Lake Oahe Fee-Owned Land
- Other Government Lands

0 2 4 8 Miles

DAKOTA ACCESS, LLC

Dakota Access Pipeline Project
Figure 13
Route Alternative
Lake Oahe Crossing
Emmons & Morton Counties, North Dakota

	1:650,000
NAD 1983 UTM Zone 14N	Date: July, 2015

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