FINAL
ENVIRONMENTAL ASSESSMENT

Dakota Access Pipeline Project
Section 408
Consent for Crossing Federally Authorized Projects and Federal Flowage Easements

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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 (DAPL Project), which would cross lands containing projects funded or authorized by the federal government or cross lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers (USACE) (Proposed Action). Specifically, the Proposed Action is to authorize the crossing of federal USACE projects including McGee Creek levee west of the Illinois River (Pike County, IL), the navigation channel of the Illinois River (Pike and Morgan counties, IL), the Coon Run levees east of the Illinois River (specifically Coon Run Northwest levee and Coon Run Southeast levee) (Scott County, IL), and where the proposed pipeline would cross USACE flowage easements north of Carlyle Lake (Fayette County, IL) approximately 3.5 miles west of the town of Shobonier, IL. Although outside of the scope of this EA, DAPL will plan for the protection of other crossings and associated water intakes as part of their emergency preparedness protocol in accordance with Pipeline and Hazardous Materials Safety Administration (PHMSA) requirements outlined in 49 CFR 194.

This EA was prepared by Dakota Access for the Proposed Action on behalf of the USACE as the non-federal representative for compliance with the National Environmental Policy 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, 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 Dakota Access, LLC and the USACE St. Louis District.

The USACE adopts this EA and incorporates findings within as part of stipulations to issue Section 408 consent to cross flowage easements (federal actions) to Dakota Access as the Proposed Action. This EA is being prepared 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.

Based upon “No Action”, extensive route analysis, route and system alternatives - including the preferred route, system options, and various transportation options, the Requester’s 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 above ground launchers/receivers and valve sites.

Impacts on the environment as a result of the Proposed Action would be temporary and not substantial as a result of avoiding, minimizing, and mitigating any potential impacts. Impacts on the McGee Creek levee, Illinois River navigation channel, and Coon Run levees are avoided by installing the pipeline via horizontal directional drill (HDD) beneath the features. Similarly, within the federal flowage easements north of Carlyle Lake, impacts to the Kaskaskia River and adjacent wetlands would be avoided by HDD. Impacts to wetland areas within the Proposed Action Areas/Connected Action Areas are limited to vegetation maintenance in the permanent pipeline easement. No known cultural resources would be impacted by the Proposed Action. Dakota Access would comply with all applicable local, state, and federal regulations and permits associated with the construction and operation of the Proposed Action.

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1. INTRODUCTION

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 (Appendix A – Figure 1). The operator of the Project is DAPL-ETCO Operations Management, LLC. In coordination with the U.S. Army Corps of Engineers (USACE), 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) 1500-15-08), Corps of Engineers Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements, prepared this Environmental Assessment (EA) to evaluate the potential effects of the Dakota Access Pipeline Project (**DAPL Project**), which would cross lands containing projects funded by the federal government or cross lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers (**Proposed Action**) near the Illinois River in Pike, Morgan, and Scott counties, Illinois, and near the Kaskaskia River in Fayette County, Illinois. Areas that are potentially impacted by construction and/or operation of the Proposed Action are referred to herein as the **Proposed Action Area(s)**.

1.1. DAPL Project Location

The DAPL Project is an approximately 1,134 mile, 12-30-inch long crude oil pipeline project beginning near Stanley, North Dakota, and ending at Patoka, Illinois. In Illinois, the prosed 30-inch pipeline enters the state at the crossing of the Mississippi River in Hancock County and then extends approximately 186 miles to the southeast, terminating near Patoka in Marion County, Illinois (Appendix A – Figures 2 and 3). The Proposed Action Areas/Connected Action Areas under consideration in this analysis are described in Section 2.3.

1.2. Purpose and Need of the DAPL Project and the USACE Proposed Action

The purpose of the proposed DAPL Project is to efficiently and safely transport sweet 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 up to 570,000 barrels per day (bpd) of crude oil (approximately 450,000 bpd initially). 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. These refineries are depend on a reliable shipment of crude oil to produce gasoline, diesel fuel, and other petroleum products for U.S. consumers.

The Proposed USACE Action is to issue permission under Section 14 of the Rivers and Harbors Act of 1899, codified 33 U.S.C. Section 408 (Section 408) for the applicant to cross lands containing projects funded by the federal government or cross lands that have federal government flowage easements (levees, river navigation channels, flowage easements) under management by the U.S. Army Corps of Engineers - St. Louis District. These crossings have been determined by the applicant to constitute a portion of the most environmentally protective routing for the DAPL Project.

1.3. Authority and Scope of the EA

Authority – The proposed DAPL Project crossings of USACE projects, as well as consent to cross the flowage easement north of Carlyle Lake, would require permissions from the USACE, which are the federal actions associated with this EA. This authority derives from 33 U.S.C. Section 408, which requires USACE to give

permission before any entity may use, occupy or alter[1] a federal project constructed for navigation or flood control. Therefore, the scope of this EA is limited to the crossings of lands containing projects funded by the federal government or lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers - St. Louis District that would require Section 408 permission by USACE.

Scoping - To obtain comments on the Proposed Action, and to identify concerns that may need to be addressed in this EA, USACE issued a public notice of the Section 408 review of the DAPL Proposed Action on 5 January 2016. Further, tribes, Tribal Historic Preservation Offices, State Historic Preservation Offices, the Advisory Council on Historic Preservation, and interested parties were consulted by USACE St. Louis District personnel.

Scope – The scope of the this EA is limited to the proposed crossings (Proposed Action Areas/Connected Action Areas) of the McGee Creek levee west of the Illinois River (Pike County, IL), the navigation channel of the Illinois River (Pike and Morgan counties, IL), the Coon Run levees east of the Illinois River (specifically Coon Run Northwest levee and Coon Run Southeast levee) (Scott County, IL), and where the proposed pipeline would cross USACE flowage easements north of Carlyle Lake (Fayette County, IL) approximately 3.5 miles west of the town of Shobonier, IL.

Permissions – Before the pipeline may be installed, USACE must first determine that the construction, operation and maintenance of the pipeline within the areas of USACE authority will not be injurious to the public interest and will not impair the usefulness of the federal navigation and flood risk management projects.

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[1]33 U.S.C. Section 408 provides as follows:

> It shall not be lawful for any person or persons to take possession of or make use of for any purpose, or build upon, alter, deface, destroy, move, injure, obstruct by fastening vessels thereto or otherwise, or in any manner whatever impair the usefulness of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the United States, or any piece of plant, floating or otherwise, used in the construction of such work under the control of the United States, in whole or in part, for the preservation and improvement of any of its navigable waters or to prevent floods, or as boundary marks, tide gauges, surveying stations, buoys, or other established marks, nor remove for ballast or other purposes any stone or other material composing such works: *Provided,* That the Secretary of the Army may, on the recommendation of the Chief of Engineers, grant permission for the temporary occupation or use of any of the aforementioned public works when in his judgment such occupation or use will not be injurious to the public interest: *Provided further,* That the Secretary may, on the recommendation of the Chief of Engineers, grant permission for the alteration or permanent occupation or use of any of the aforementioned public works when in the judgment of the Secretary such occupation or use will not be injurious to the public interest and will not impair the usefulness of such work.

NEPA Compliance – The Proposed Action does not qualify for a Categorical Exclusion from NEPA documentation as defined by ER 200-2-2, 4 March 1998 paragraph 9. Thus, this EA has been prepared as required under NEPA to determine potential impacts that may occur as result of implementing the Proposed Action. If it is determined that no significant impacts would be incurred after implementing the mitigation measures described within this document, USACE would issue a finding of no significant impact (FONSI). If it is determined that significant impacts would be incurred as a result of construction and/or operations of the Proposed Action, an environmental impact statement (EIS) would have to be prepared to further evaluate the Proposed Action under NEPA.

This environmental assessment 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 or USACE). The USACE will make a final determination regarding compliance of the activities with NEPA and Section 408 with the completed information contained herein.

2. ALTERNATIVES

The alternatives available to the St. Louis District in responding to the request are limited because of limited federal control and responsibility for the DAPL Project. If a determination is made that environmental impacts, including mitigation and appropriate measures to minimize environmental impacts, are acceptable, the Proposed Action may be approved. For this reason, alternatives addressed in detail in this EA include a "No Action" Alternative and Proposed Action Alternative (Requester's Preferred Alternative).

2.1. Alternatives Considered but Eliminated from Detailed Analysis

2.1.1. Alternative 1 – Modification of Existing Infrastructure Alternative

The parent company of Dakota Access, Energy Transfer Company (Company) is one of the largest and most diversified investment grade limited partnerships in the United States with approximately 71,000 miles of pipeline assets today (Energy Transfer, 2014). The Company and its partners have a presence in more than half of the contiguous United States; including some existing assets in Illinois. The Company does not own or operate any existing facilities connecting to the Bakken shale; the DAPL Project will be the Company's first asset to do so. 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 DAPL Project's objectives or shippers' demands of transporting crude from the Bakken. Dakota Access, Energy Transfer Company asserts that there are no other major interstate pipelines that would meet the purpose and need of the DAPL Project. For this reason, the manipulation of operating pressures or additional of pump stations to increase transport capacity in pipelines or altering existing infrastructure to increase storage and transport capacity are not viable options to meet the purpose and need of the DAPL Project.

2.1.2. Alternative 2 – 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 DAPL 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 has affected 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 up to 570,000 bpd (450,000 bpd initially) approximately 1,134 miles across four states. A pipeline is a safer and more economical alternative than trucking for the volumes transported and distances covered by the DAPL Project. Assuming the average oil tanker truck is capable of holding about 220 barrels of oil, the transportation of the initial 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 for the DAPL 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) indicate that the truck transportation alternative would not be a viable alternative.

2.1.3. Alternative 3 – Rail Transportation Alternative

Reliance on rail as a transportation method in the Williston Basin has drastically increased in recent years, from carrying a negligible percentage of the overall market share in 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 transport the additional supplies.

Challenges 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 these industries, the use of pipelines is not an option. Thus, further increasing demand for rail transportation would likely result in an increased reliance on trucking for these industries, which would exacerbate some of the issues listed in the section above.

Assuming a carrying capacity of 600 barrels per car, 750 rail cars would be required to collectively depart the tank terminals daily to transport the initial volume of 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, 6 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 that could transport the volume of crude oil proposed by 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, the number of transportation accidents associated with railroad transport is consistently substantially higher than that associated with pipelines (DOT, 2015). 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 (DOT, 2015), such as distances covered by the DAPL Project. As such, rail transportation is not considered a viable alternative.

2.1.4. Alternative 4 – Route Alternatives

Major route alternatives were evaluated for the pipeline route as a whole. During the DAPL 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 DAPL 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 use (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 dataset showing existing pipeline locations 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 as high risk, the GIS routing program excluded any national parks from the pipeline route to avoid impacts on these federal lands.

In this manner, the preferred alternative was identified through the GIS-based routing program and required only minor adjustments based on observed field conditions during onsite surveys and engineering/design. This method of alternative route selection does not approach route alternative assessment in the traditional sense (e.g., physically mapping alternatives), but rather evaluates a multitude of datasets that are considered during the initial analysis. This analysis results in a preferred alternative that, if field surveys validate, meets the same objective of locating the alignment in the most environmentally, socially, and economically suitable corridor.

2.1.5. Alternative 5 – 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 reducing impacts to resources. Pipeline construction methods utilized at waterbody crossings are highly dependent on the characteristics of the waterbody encountered. During the DAPL Project planning stages, a variety of waterbody crossing techniques were considered, 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: dam and pump, flume, and wet open-cut. The 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 Illinois and Kaskaskia River systems, it is not reasonable to temporarily divert the water either by pump or flume, and these methods were eliminated from consideration for the crossings of the Illinois River and the Kaskaskia River.

In the wet open-cut crossing method, 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 and excavate a trench. The banks of the waterbody 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. Since the widths of the Illinois River and the Kaskaskia River are such that operating trenching equipment entirely from the banks would not be possible, trench excavation in the waterbodies would require equipment to operate 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 drastically increase 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). Furthermore, equipment operating at and within the waterbody would require exclusion of other water-based activities in the area (i.e. recreation, commercial traffic, etc.). Compared to trenchless technology, the wet open-cut method would incur far greater impacts on habitat located both on the banks and within the waterbodies. Therefore, this method of construction was eliminated from consideration.

The trenchless construction method known as HDD was selected as the preferred construction method to cross major rivers because it would result in fewer impacts on resources. Further information regarding the HDD construction method is provided in Section 2.3.2.6.

2.2. No Action Alternative

Under the “No Action” alternative, Dakota Access would not construct the DAPL 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 Requester’s Preferred Alternative.

2.3. The Proposed Pipeline Action (Requester's Preferred Alternative)

2.3.1. Location and Detailed Description of the Proposed Action

Dakota Access proposes to construct the 30-inch-diameter pipeline within the USACE - St. Louis District so that the majority of lands crossed would be privately-owned lands. Selecting the alignment 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.). Because of the location of the McGee Creek levee, Illinois River, and Coon Run levees, and the federal flowage easements north of Carlyle Lake, avoidance of these areas was not feasible. The selected crossing location of the Proposed Action avoids USACE projects and flowage easements to the extent practicable. The Proposed Action crosses the McGee Creek levee for approximately 290 feet, the Illinois River for approximately 700 feet, the Coon Run levees for approximately 450 feet (Appendix A – Figures 4-2a, 4-2b), and federal flowage easement tracts north of Carlyle Lake for approximately 12,778 feet (2.42 miles) (Appendix A – Figure 4-2c).

2.3.1.1. Proposed Action Area Maps

The following narratives relate to Figures 4-2a through 4-4c in Appendix A and are provided to assist the reader in identifying the Proposed Action Areas/Connected Action Areas under consideration in this analysis.

The **dashed red line** shows the DAPL Project centerline as it approaches the USACE project areas. The **solid red line** indicates the pipeline that will go beneath USACE project areas. The **yellow polygon** indicates workspace where temporary work is proposed to be completed that directly supports the HDD installation of the pipeline underneath the Illinois and Kaskaskia Rivers, as well as the trenched area within the Carlyle Lake flowage easement area. Areas within the **yellow polygons** are the Proposed Action Areas/Connected Action Areas being considered as part of the federal action to issue a Section 408 consent. Temporary activities that would occur in this workspace include: connecting and welding together pipe, inspecting and testing the pipeline to ensure no leaks are present prior to preparing for installation. Potential impacts must be evaluated in workspaces associated with the pipeline crossings of USACE projects and flowage easement lands (Connected Action Areas), since activities conducted there are directly connected to the applicant's ability to complete the Proposed Action. Further, these activities are directly connected to the federal decision to grant consent for the pipeline to cross USACE projects in these areas.

Notice that the USACE is not analyzing the effects of the **dashed red line** (DAPL centerline) outside of the yellow polygon between the HDD exit point for the McGee Creek levee / Illinois River crossing (Appendix A – Figures 4-2a, 4-3a, and 4-4a) and the HDD entry point for the Coon Run levees crossing (Appendix A – Figures 4-2b, 4-3b, and 4-4b), as it does not exist as a result of the federal action. Likewise, the USACE is not analyzing the effects of the **dashed red line** (DAPL centerline) outside of the yellow polygon outside of the Carlyle Lake flowage easement boundaries (**solid green line**), as it does not exist as a result of the federal action (Appendix A – Figures 4-2c, 4-3c, and 4-4c). **Purple polygons** indicate real estate interests; specifically the flowage easements that the USACE has with private landowners upstream of Carlyle Lake (Figures 4-2c, 4-3c, and 4-4c).

The Proposed Action Areas/Connected Action Areas under consideration in this analysis are described in more detail in Sections 2.3.1.2 and 2.3.1.3.

Table 1 identifies the construction workspace for the Proposed Action which is necessary to cross the USACE projects and flowage easements. Table 2 identifies land status (private, or federal easement) and provides associated acreages for the Proposed Action Areas/Connected Action Areas analyzed within this EA.

Table 1
USACE Project and Flowage Easements Crossed by the Proposed Action

USACE Projects	County	Construction Workspace Within Action Areas (acres)
McGee Creek Levee	Pike	1.14[1]
Illinois River	Pike, Morgan	
Coon Run Levees	Scott	0.52[1]
Total Acres		**1.66**
USACE Flowage Easements		
Tract No. 1881E	Fayette	2.03
Tract No. 1818E	Fayette	0.80
Tract No. 1819E	Fayette	1.72
Tract No. 1820E	Fayette	3.96
Tract No. 1821E	Fayette	1.14
Tract No. 1807E	Fayette	8.39
Tract No. 1735E	Fayette	7.41
Tract No. 1734E	Fayette	0.53
Tract No. 1743E	Fayette	1.76
Tract No. 1742E	Fayette	1.17
Tract No. 1741E-2	Fayette	1.43
Total Acres		**30.34**

[1]Feature will be crossed by HDD; however, the 50-ft.-wide permanent right-of-way (ROW) may be used to layout guidance wires for the HDD.

The EA review area includes areas within USACE project lands and USACE flowage easements that are potentially impacted by construction and/or operation of the DAPL Project. The EA review area is hereafter referred to as the Proposed Action Area(s) and/ or the Proposed Action Areas/Connected Action Areas. Actions that occur outside of the USACE project lands and flowage easements that are directly related to the Proposed Action 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 Connected Actions associated with the Proposed Action are those that relate to the HDD workspace and stringing areas at the McGee Creek levee, Illinois River, and Coon Run levees crossings; in addition to three proposed temporary access roads that would be utilized to access the HDD workspaces. The Connected Actions associated with crossing the federal flowage easements in Fayette County are the HDD stringing area that extends to the west of the western HDD entry/exit point of the Kaskaskia River crossing and two temporary access roads. The Kaskaskia River HDD stringing area extends to the west, outside of the federal flowage easement tracts.

Table 2 Environmental Assessment Areas of Interest			
Action/Activity	**Federal/ Private Land**	**EA Review**	**Acres**
USACE Project – McGee Creek Levee and Illinois River – Pike, Morgan, and Scott Counties			
Section 408 consent - HDD profile across the McGee Creek levee	Private; Federal Consent	Action Area	0.33
Section 408 consent - HDD profile across the Illinois River	Unknown	Action Area	0.81
HDD workspace and stringing area necessary to complete the HDD across the McGee Creek levee and Illinois River	Private	Connected Action	17.86
Temporary access road to access HDD workspace west of Illinois River	Private	Connected Action	0.12
Temporary access road to access HDD workspace east of Illinois River	Private	Connected Action	0.12
USACE Project – Coon Run Levees – Scott County			
Section 408 consent - HDD profile across the Coon Run levees	Private; Federal Consent	Action Area	0.52
HDD workspace and stringing area necessary to complete the HDD crossing the Coon Run levees and Illinois River	Private	Connected Action	17.18
Temporary access road to access HDD workspace on the west side of the levee	Private	Connected Action	0.13
USACE Flowage Easements - Fayette County			
Construction ROW within USACE flowage easements	Private; Federal Easement	Action Area	30.34
Temporary access road to access HDD workspace and alignment west of the Kaskaskia River	Private; Federal Easement	Action Area	0.95
Temporary access road to access HDD workspace and alignment east of the Kaskaskia River	Private; Federal Easement	Action Area	2.1
HDD stringing area necessary to complete the HDD across the Kaskaskia River	Private	Connected Action	4.95

2.3.1.2. Proposed Federal Action Areas

The proposed 30" DAPL crossing of the McGee Creek levee and Illinois River is located in Section 12, Township 3 South, Range 2 West in Pike County, Illinois, and Sections 28, 33, 34, and 5, Township 16 North, Range 13 West in in Morgan and Scott Counties, Illinois. The HDD design reflects a crossing length of approximately 6,500 feet at the McGee Creek levee and Illinois River, of which approximately 990 feet occurs beneath the McGee Creek levee (290 feet) and Illinois River (700 feet) (Appendix A – Figures 4-2a, 4-3a, 4-4a).

The proposed 30" DAPL crossing of the Coon Run levees is location in Sections 3 and 4, Township 16 North, Range 13 West in Scott County, Illinois. The HDD of the Coon Run levees reflects a crossing length of approximately 4,341 feet, of which approximately 450 feet occurs beneath the Coon Run levees (Appendix A – Figures 4-2b, 4-3b, 4-4b).

The HDD entry and exit point workspaces, stringing areas, and temporary access roads would be located on private land outside of the USACE project areas and are considered Connected Actions in this analysis. Between HDD entry/exit points Dakota Access would acquire a 50-foot-wide permanent easement, but within forested areas, only 30-feet would be maintained in an herbaceous/scrub shrub state to accommodate line inspections.

2.3.1.3. Federal Flowage Easement Area

The federal flowage easements north of Carlyle Lake are agreements between private landowners and USACE to allow for valley storage of floodwaters that may exceed the capacity of Carlyle Lake to the south and prevent downstream flood events within the Illinois River basin. The proposed 30" DAPL crosses approximately 12,778 feet (2.42 mile) of the federal flowage easements in Fayette County in Sections 22, 23, 24, and 25, Township 5 North, Range 1 West. The two temporary access roads, totaling 2,061 feet (0.39 mile) and 4,580 feet (0.87 mile) would be utilized for construction access to the HDD workspace and alignment on the west and east sides of the Kaskaskia River, respectively (Appendix A – Figures 2c, 3c, 4c).

2.3.2. Description of Construction Techniques and Construction Mitigation Measures

All facilities associated with the DAPL Project would be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (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 B), which includes Best Management Practices Figures and the Spill Prevention Control and Countermeasure Plan (SPCC Plan) as appendices. Additionally, Dakota Access would implement their HDD Construction Plan (HDD Construction; see Appendix C) to avoid inadvertent release of drilling mud during HDD construction work at wetland and waterbody crossings to protect sensitive resources from such releases. The Proposed Action 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 woody vegetation within wetlands would be limited to the proposed permanent DAPL easement within the HDD profile of the Illinois River and Kaskaskia River, and within the construction workspace within the federal flowage easements. 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 wetland and waterbody crossings to limit the exposure and impact to these features; clearing these buffers would take place just prior to crossing the feature. 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 D). 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 prior to being placed in service as described in Sections 3.2.1.2 and 3.12.

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 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 C), and the HDD Design Reports (Appendix E) by utilizing this 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 riparian areas, avoiding impacts on the steep banks, cultural resources, and sensitive habitat immediately adjacent to the waterbody. Cross sections of the Illinois River and Kaskaskia River HDDs are provided in Appendix E – Drawing W_29004_C100064 and Appendix E – Drawing W_29004_C100078.

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. As part of the Section 408 permission review, the USACE has reviewed the technical specifications of the HDD designs across USACE projects. The HDD Design Report (Appendix E) includes more details regarding HDD construction technology and methods. Further, the work would be performed by an experienced drilling contractor 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.

The potential for river channel changes associated with water erosion and scour were considered when selecting the major waterbody crossing methods and locations. The professional engineering firm evaluating HDD depths for the Proposed Action, GeoEngineers, evaluated the scour risk to the proposed pipeline during 100- and 500-year discharge events for the Illinois River and Kaskaskia River crossings.

The proposed HDD profile under the Illinois River is designed to provide 40 feet of cover below the bottom of the river. GeoEngineers considered scour potential due to long-term degradation, contraction, channel bend and scour due to conveyance restriction from piers or abutments. The Illinois River at the proposed pipeline crossing is not subject to channel contraction, a significant channel bend or local scour conditions as a result of piers, abutments or channel crossing structures. Therefore, the scour potential due to those

factors is negligible. To provide a qualitative assessment of scour risk GeoEngineers followed field-based regression data using material size published by Blodgett in 1986 and summarized in the NRCS Technical Supplement 14B published in 2007. An approximate maximum scour depth between 10 and 12 feet is indicated for the channel bed material identified in the GeoEngineers borings for the Proposed Action reach. Because of the depth of the pipe below the waterbody, and the condition of the Illinois River, this crossing is at a low risk to geomorphologic movements at the proposed crossing.

The Kaskaskia River HDD profile is designed to provide a minimum of 36 feet of cover at the crossing location beneath the lowest point of the river bed. This crossing has less proposed cover between the bottom of the waterbody and the top of the buried pipe than the crossing depth proposed for the Illinois River identified above. The Kaskaskia River is a highly sinuous channel within an approximate 1,500-foot floodplain. The river channel is subject to active lateral migration and planform modification as evident from the numerous meander scrolls and oxbow wetlands. The anticipated long-term degradation of the floodplain is limited because this Proposed Action reach has the ability to expend erosive energy laterally rather than vertically. Much like the proposed Illinois River crossing, the Kaskaskia River crossing is not subject to channel contraction, a significant channel bend or local scour conditions as a result of piers, abutments or channel crossing structures. Therefore, the scour potential due to those factors is negligible. To provide a qualitative assessment of scour risk GeoEngineers followed field-based regression data using material size published by Blodgett in 1986 and summarized in the NRCS Technical Supplement 14B published in 2007. An approximate maximum scour depth up to 15 feet is indicated for the channel bed material identified in the GeoEngineers borings for the Proposed Action reach. Because of the depth of the pipe below the waterbody, and the condition of the Kaskaskia River, this crossing is at a low risk to geomorphologic movements at the proposed crossing.

Based upon their calculated worst-case scenario scour estimate, GeoEngineers considers the risk of scour occurring down to the level of the proposed pipeline to be low and the proposed Illinois and Kaskaskia River HDD design profiles to be appropriate.

2.3.2.7. Minor Waterbody Crossing Methods

The minor waterbodies crossed by the pipeline in association with the crossings of the McGee Creek levee, Illinois River, and Coon Run levees would be crossed in the same HDD profiles that cross the Illinois River and the Coon Run levees. One minor waterbody west of the Kaskaskia River would be crossed in the same profile of the HDD for the Kaskaskia River. Other minor waterbodies encountered on the federal flowage easements would be crossed by open-cut construction methods. One intermittent tributary to the Kaskaskia River would be crossed by the HDD pull-string area on the west side of the Kaskaskia River. Additionally, one ephemeral, one intermittent, and one perennial waterbody (Cassar Creek) have been identified within the federal flowage easements, east of the Kaskaskia River crossing. To cross these waterbodies, equipment would operate from the banks of the waterbody to the maximum extent practicable to excavate a trench. Flow would be maintained at all times. Excavated material from the trench would be placed on the bank above the ordinary high water mark for use as backfill. The pipe segment would be prefabricated and weighted, as necessary, to provide negative buoyancy and placed below scour depth. Typical backfill cover requirements would be met, contours would be restored within the waterbody, and the banks would be stabilized via seeding and/or the installation of erosion control matting or riprap. Excess excavated materials would be distributed in an upland area in accordance with applicable regulations.

2.3.2.8. Wetland Crossings

Wetlands that would be crossed in the Proposed Action Area are located within the permanent DAPL easement between HDD workspace of the McGee Creek levee and Illinois River, and on the federal flowage easements north of Carlyle Lake. Wetland impacts would be temporary with the exception of permanent conversion impacts of forested wetlands to emergent wetlands over the permanent ROW. A more detailed discussion regarding wetlands is provided in Section 3.2.4.

2.3.2.9. Operation and Maintenance

Following completion of construction, a 50-foot-wide permanent DAPL easement 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 DAPL 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 forested wetland areas within the HDD profile of the Illinois River and within flowage easements north of Carlyle Lake (Appendix A – Figure 4-4c).

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. Vegetation maintenance of the ROW in areas of active cropland is not expected to occur due to agricultural practices.

3. THE AFFECTED ENVIRONMENT AND POTENTIAL ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND NO ACTION ALTERNATIVES

3.1. Topography, Geology and Soils

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project and no impacts on geology and soils would occur. However, if the objectives of the DAPL 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 Action. 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. Topography and Geology

3.1.1.1. Affected Environment

The bedrock geology along the Illinois River and associated McGee Creek levee and Coon Run levees crossings is characterized by Pennsylvanian and Mississippian-age sedimentary formations (Kolata, 2005). The Pennsylvanian formations, Carbondale Formation and Tradewater Formation, consist of sandstones and shales with occurrences of coal. The Mississippian formations, Warsaw Formation, Salem Limestone, Meppen Limestone, Fern Glen Formation, and Burlington-Keokuk Limestone, consist primarily of limestones with some dolostone lithologies. The bedrock is covered in the crossing area with alluvium and glacial drift deposits (clays, silts, sand and gravel deposits) at depths ranging from approximately 50 to greater than 100 feet below ground surface (Piskin and Berstrom, 1975).

The proposed Illinois River and associated levee crossing lies within the Dissected Till Plains Section of the Central Lowlands Physiographic Province. On the east side of the Illinois River topography ranges in elevation from 609 to 420 feet above mean sea level (MSL). The HDD exit point workspace ranges from 426 to 445 feet MSL.

The bedrock geology along the federal flowage easements north of Carlyle Lake is characterized by Pennsylvanian-age sedimentary formations (Kolata, 2005). The Pennsylvanian-age Bond Formation consists of sandstones and shales with occurrences of coal. The bedrock is covered in the crossing area with alluvium and glacial drift deposits (clays, silts, sand, and gravel deposits) at depths ranging from approximately 50 to greater than 100 feet below ground surface (Piskin and Berstrom, 1975).

The proposed crossing within the federal flowage easements lies within the Dissected Till Plains Section of the Central Lowlands Physiographic Province. The topography ranges in elevation from 460 on the east to 472 feet above MSL on the west.

3.1.1.2. Impacts and Mitigation

To protect the terrain of the Proposed Action Areas/Connected Action Areas, 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).

Construction of the pipeline in the Proposed Action Areas/Connected Action Areas 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 these areas.

The impacts attributable to the HDD would not be significant. Vibrations produced during the HDD process are not of a magnitude that would cause any impacts to geologic features or other resources. Any vibrations associated with the drilling process would be limited to the immediate vicinity of the drilling equipment on the surface and downhole. The vibrations produced from the downhole tooling are of a very low magnitude and are attenuated very quickly by the formation such that vibrations are not felt at the surface. A vibration monitoring analysis conducted by GeoEngineers in 2009 found that peak particle velocities were less than 0.07 inches/second within approximately 50 feet of HDD operations. These velocities are well below that which would cause any structural impacts and moreover, the recorded vibrations were, in fact, imperceptible to human senses (GeoEngineers, 2009). Primary impacts of open trench installation within the USACE 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 Proposed Action would not result in adverse impacts on topography or geology on USACE project lands or federal flowage easements of the Proposed Action Area/Connected Action Areas. 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 Proposed Action Area or Connected Actions, given that the HDD would be conducted in alluvium and glacial drift deposits, 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 F).

3.1.2. Geologic Hazards

3.1.2.1. Affected Environment

Earthquakes and Seismic Hazards

Earthquakes occur in Illinois about once every year; however damaging quakes are much less frequent. Minor damage from Illinois earthquakes is reported about once every 20 years. 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 8 to 20 percent gravity (g) in the Proposed Action Areas/Connected Action Areas (USGS, 2014).

Ground movement from an earthquake of this magnitude may cause a light perceived shaking but is not expected to cause any structural damage (USGS 2016). The low seismic hazard of the Proposed Action Area is further corroborated by the relatively low number of earthquakes that have historically occurred in the areas of interest in Illinois (ISGS, 2016).

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 Proposed Action Areas for landslide incidence and susceptibility (Radbruch et al., 1982). Analysis of this map showed that both the USACE projects and the flowage easement areas are in an area categorized as having a low incidence of landslides.

Karst and Subsidence

Karst topography occurs in Illinois where the bedrock lithology consists of carbonate rocks (limestone and dolomite) and the drift thickness is typically less than 50 feet. Geologic terrain beneath the flowage easement consists of predominantly noncarbonated bedrock with drift thickness of 50 feet or greater (Weibel and Panno, 1997); therefore, there is little risk of impact due to karst topography in this area.

Geologic terrain beneath the USACE projects (levees) and associated HDD workspace areas may have potential for karst development due to deposits of limestone and other carbonate bedrock formations (Weibel and Panno, 1997). However, a review of bedrock geology data indicated that the drift thickness in this area was 50 feet or greater, which greatly reduces the risk of impacts due to karst topography. Additionally, 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.

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 Proposed Action Area since no mines, oil/gas wells, water wells, or karst development have been identified in the vicinity.

3.1.2.2. Impacts and Mitigation

Though potential impacts associated with geologic hazards is low, Dakota Access would utilize erosion and sediment control devices in accordance with the 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 Proposed Action, 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 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 Proposed Action facilities. Therefore, construction and operation of the Proposed Action would not be expected to increase the potential for significant landslide or slip events or result in adverse impacts on aquatic life or resources within the Proposed Action Areas.

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 impacts on the pipeline from geologic hazards are expected to be minimal.

No impacts associated with seismic activity within the Proposed Action 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. No impacts associated with landslides or subsidence within the Proposed Action Area are anticipated, and no areas have a slope that meets or exceeds 25%. Additionally, no impacts due to karst topography within the Proposed Action Area are anticipated. Therefore, no mitigation beyond designing the proposed pipeline to currently accepted industry specifications is necessary.

3.1.3. Soils

3.1.3.1. Affected Environment

Dakota Access identified and assessed soil characteristics in the Proposed Action Area using the Soil Survey Geographic Database, which is a digital version of the original county soil surveys developed by the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) for use with geographic information systems (GIS) (USDA, 2015). The Proposed Action Areas in Pike, Morgan, and Scott Counties are within the Central Mississippi Valley Wooded Slopes. The Proposed Action Area in Fayette County is within the Central Claypan Areas. The dominant soil orders in the Central Mississippi Valley Wooded Slopes, Northern Part, are Alfisols, Entisols, Inceptisols, and Mollisols which are very deep, poorly drained to excessively drained, and loamy, silty, or clayey. The dominant soil orders in the Central Claypan Areas are Alfisols which are generally very deep, well drained to poorly drained, and loamy or clayey (USDA, 2006). Table 3 lists the map soil types within the Proposed Action Areas/Connected Action Areas. Mapped soils can be seen in Appendix A – Figures 4-3a-4-3c.

Table 3
Soil Types Mapped within the Proposed Action Area

Soil Map Unit	Soil Map Unit Name	Proposed Action Area (acres)[1]	Farmland Rating	Hydrologic Group[2] (infiltration)	Hydric Rating[3]	Wind Erodibility Group[4]
8302A	Ambraw clay loam, 0 to 2 percent slopes, occasionally flooded	0.39	Prime farmland if drained	C/D	95%	6
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	0.39	Prime farmland if drained	C/D	90%	6

Table 3
Soil Types Mapped within the Proposed Action Area

Soil Map Unit	Soil Map Unit Name	Proposed Action Area (acres)[1]	Farmland Rating	Hydrologic Group[2] (infiltration)	Hydric Rating[3]	Wind Erodibility Group[4]
3070	Beaucoup silty clay loam, frequently flooded	6.64	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	C/D	100%	6
1070L	Beaucoup silty clay loam, undrained, 0 to 2 percent slopes, frequently flooded, long duration	1.38	Not prime farmland	C/D	85%	6
8070A	Beaucoup silty clay loam, 0 to 2 percent slopes, occasionally flooded	1.98	Prime farmland	C/D	90%	6
134B	Camden silt loam, 2 to 5 percent slopes	1.67	Prime farmland	B	0%	6
8071A	Darwin silt clay, 0 to 2 percent slopes, occasionally flooded	1.31	Prime farmland if drained	D	85%	4
8180A	Dupo silt loam, 0 to 2 percent slopes, occasionally flooded	0.09	Prime farmland	C/D	6%	5
8F	Hickory silt loam, 18 to 35 percent slopes	0.26	Not prime farmland	B	0%	5
1426	Karnak silty clay loam, wet	3.01	Not prime farmland	C/D	100%	8
7081A	Littleton silt loam, 0 to 2 percent slopes, rarely flooded	1.68	Prime farmland	B/D	2%	6
200A	Orio loam, 0 to 2 percent slopes	0.40	Prime farmland if drained	C/D	98%	5
3288	Petrolia silt loam, frequently flooded	7.10	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	C/D	100%	6
54B	Plainfield sand, 1 to 7 percent slopes	7.14	Farmland of statewide importance	A	2%	1
54D	Plainfield sand, 7 to 15 percent slopes	1.46	Farmland of statewide importance	A	2%	1

Table 3
Soil Types Mapped within the Proposed Action Area

Soil Map Unit	Soil Map Unit Name	Proposed Action Area (acres)[1]	Farmland Rating	Hydrologic Group[2] (infiltration)	Hydric Rating[3]	Wind Erodibility Group[4]
430A	Raddle silt loam, 0 to 3 percent slopes	1.10	Prime farmland	B	0%	6
3073A	Ross silt loam, 0 to 2 percent slopes, frequently flooded	0.27	Prime farmland if protected from flooding or not frequently flooded during the growing season	B	7%	5
88B	Sparta loamy sand, 1 to 6 percent slopes	4.23	Farmland of statewide importance	A	1%	2
588A	Sparta loamy sand, loamy substratum, 0 to 2 percent slopes	0.76	Farmland of statewide importance	A	0%	2
3284	Tice silt loam, frequently flooded	1.16	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	C	0%	6
3404L	Titus silty clay loam, 0 to 2 percent slopes, frequently flooded, long duration	0.36	Not prime farmland	C/D	100%	4
8404A	Titus silty clay loam, 0 to 2 percent slopes, occasionally flooded	1.70	Prime farmland if drained	C/D	90%	4
3333	Wakeland silt loam, frequently flooded	9.17	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	C	0%	5
333A	Wakeland silty loam, 0 to 2 percent slopes, frequently flooded	0.49	Prime farmland if drained and either protected from flooding or not frequently flooded during the growing season	B/D	5%	5

Table 3 Soil Types Mapped within the Proposed Action Area						
Soil Map Unit	**Soil Map Unit Name**	**Proposed Action Area (acres)[1]**	**Farmland Rating**	**Hydrologic Group[2] (infiltration)**	**Hydric Rating[3]**	**Wind Erodibility Group[4]**
3333L	Wakeland silty loam, 0 to 2 percent slopes, frequently flooded, long duration	0.54	Not prime farmland	B/D	95%	5
W	Water	1.07	Not prime farmland	NA	0%	NA
7037A	Worthen silt loam, 0 to 2 percent slopes, rarely flooded	4.13	Prime farmland	B	3%	5
	Total	**59.85**	--			

[1]The Proposed Action 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.

3.1.3.2. 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 SWPPP 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 Proposed Action 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.

Soils would be temporarily disturbed within HDD workspaces during construction at the McGee Creek levee, Illinois River, and Coon Run levees crossings. Primary impacts attributable through open trench installation within the USACE flowage easements and Connected Action Areas would be limited to construction activities and consist of temporary alteration of the construction ROW due to grading and trenching operations. By implementing BMPs and recognized construction methods (Appendix B), 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 mud and cuttings would not be disposed in waters of the U.S. 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 their SWPPP (Appendix B). 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. 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.

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

3.2. Water Resources

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project, and no impacts on water resources would occur. However, if the objectives of the DAPL 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 DAPL 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

Dakota Access conducted field and desktop delineations of the Proposed Action Areas/Connected Action Areas on the flowage easements and the Proposed Action Areas/Connected Action Areas of the USACE project 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. Dakota Access identified 12 waterbodies within the Proposed Action

Areas/Connected Action Areas (Appendix A – Figures 4-4a-c). These waterbodies include the Illinois River, a large perennial river that forms the border between Pike and Morgan Counties; and the Kaskaskia River, a perennial river, within Fayette County, as well as smaller tributaries to the Illinois and Kaskaskia Rivers.

3.2.1.2. Impacts and Mitigation

Direct and indirect impacts to all but three water bodies within the Proposed Action Areas/Connected Action Areas would be minimized by using HDD construction methods to install the proposed pipeline underneath the Illinois and Kaskaskia Rivers. At the Illinois River crossing, the pipeline would be installed a minimum of 40 feet below the bottom of the Illinois River and a minimum of 58 feet below the associated unnamed tributary. The pipeline would be installed a minimum of 57 feet below the waterbodies associated with the Coon Run levees of the Illinois River. The pipeline would be installed a minimum of 36 feet below the Kaskaskia River and associated unnamed tributary. Where perennial waterbodies are open cut, the pipeline will be installed a minimum of 5 feet below the bottom of the channel. Additional documentation elaborating on the rationale used to determine suitable HDD depth is provided in Appendix E.

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 the drilling fluid to leak through previously unidentified fractures in the material underlying the river beds. 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). Because the HDD entry and exit points would be set back from the banks of the Illinois River (approximately 0.55 miles from the west bank and 0.63 miles from the east bank) and the Kaskaskia River (approximately 0.47 miles from the west bank and 0.22 miles from the east bank) 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 the waterbodies. 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 HDD work according to their HDD Construction Plan (Appendix C), and implement the HDD Contingency Plan (Appendix C) 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 (Appendix C).

Dakota Access plans to hydrostatically test the HDD pipeline segments both before and after installation at the Illinois and Kaskaskia River crossings. Hydrostatic pre-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 proposing to use surface water from the Illinois River and the Kaskaskia River to facilitate installation of the HDD and hydrostatic testing of the pipeline at the McGee Creek levee, Illinois River, Coon Run levees, and Kaskaskia River HDD crossings. Up to 1,000,000 gallons of water may be used from the Illinois River and up to 500,000 gallons of water may be used from the Kaskaskia River. The acquisition points would coincide with the proposed pipeline crossing points, but would not require the installation of temporary water lines or use of equipment over levees. In order to get water to the Coon Run levees HDD pipeline segment, the water would be transported by truck since a temporary water line would be too long and would cross the Coon Run levees. Water would be pumped using an 8" x 8" Power Associates 2500 Single Stage Pump, or equivalent, set on the bank of the rivers within secondary containment. The pump would be capable of withdrawing 2,400 gallons per minute and 120 fee of head pressure. Temporary use of surface water in the state of Illinois does not require a permit.

Water discharges associated with hydrostatic testing within the Proposed Action Areas/Connected Action Areas would be conducted in accordance with applicable permits. Dakota Access would conduct trench dewatering and hydrostatic test discharges in a manner consistent with the DAPL Project SWPPP. 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. Water would be discharged in upland areas through an energy dissipation and/or filtering device, as described in Dakota Access' SWPPP (Appendix B), to remove sediment and reduce the erosive energy of the discharge water and allow the water to infiltrate into the ground. No impacts to surface waters are anticipated through the discharge of water.

Three waterbodies within the flowage easements Proposed Action Areas/Connected Action Areas (unnamed tributary to Kaskaskia River [s-b10-fa-04], Cassar Creek [s-b1-fa-11], and unnamed tributary to Cassar Creek [S_BM-12_FA_2] would be temporarily impacted by pipeline construction. Impacts to these waterbodies would be minimized by reducing the construction ROW width to 85 feet instead of the typical 150 feet width. In addition, pipeline construction activities would follow applicable regulatory requirements.

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 pre-construction contours 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. Fuel and all other hazardous materials would be stored in accordance with the requirements of Dakota Access' Spill Prevention, Control, and Countermeasures (SPCC) and, SWPPP. These documents also describe response, containment, and cleanup measures.

In order to maintain the integrity of the pipeline, prevent product losses, and protect the general public, Dakota Access will inspect and exercise company-owned equipment in accordance with the National Preparedness for Response Exercise Program (PREP) guidelines. However, in the unlikely event of a pipeline leak once in operation, response measures to protect the users of downstream drinking water intakes will be implemented. The operator has prepared a Geographical Response Plan (GRP) and Facility Response Plan (FRP, Appendix G) that includes measures such as notifying surrounding communities, affected governments, and utilities in the event of an inadvertent pipeline release. The FRP is intended

to satisfy the applicable requirements of the Oil Pollution Act of 1990 (OPA 90), and has been prepared in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), the Sioux land Sub-Area Contingency Plan and the Upper Mississippi River Spill Response and Resource Plan. Specifically, this Plan is intended to satisfy the applicable requirements of:

- Pipeline and Hazardous Materials Safety Administration (PHMSA), U.S. Department of Transportation requirements for an OPA 90 plan (49 CFR 194)
- American Petroleum Industry (API) RP 1174 - Recommended Practice for Pipeline Emergency Preparedness and Response.

The operator has contractually secured personnel and equipment necessary to respond, to the maximum extent practicable, to a worst case discharge or a substantial threat of such discharge. The operator requires an annual certification from each Oil Spill Response Organization (OSRO) to maintain compliance with the National PREP guidelines. Each listed OSRO has its own response equipment, including containment booms, absorbents, boats, and vacuum trucks.

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 3 weeks and no fewer than 26 times per year, to check for abnormal conditions or dangerous activities, such as unauthorized excavation along the pipeline route. 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 were to occur 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 were to identify an anomaly, the operator would comply with U.S. DOT requirements to address the anomaly.

EIs would monitor compliance with applicable waterbody protection requirements during construction of the pipeline. The SWPPP (Appendix B) describes 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. Refer to Table 4 for a summary of waterbody crossings by the Proposed Action within the Proposed Action/Connected Action Areas.

Table 4 Waterbodies within the Proposed Action / Connected Action Areas					
Name	**Waterbody ID**	**Flow Type**	**Class of Aquatic Resource**	**Crossing Method**	**Area of Impact**
Unnamed Tributary to Illinois River	S_BM-4_PL_6	Perennial	§404	HDD	Permanent ROW over HDD Profile
Illinois River	S-DT-167	Perennial	§10, §404	HDD	Permanent ROW over HDD Profile
Unnamed Tributary to Coon Run	S_BM-7_SC_14	Intermittent	§404	HDD	Permanent ROW over HDD Profile
Coon Run	S_BM-7_SC_15	Perennial	§404	HDD	Permanent ROW over HDD Profile
Unnamed Tributary to Coon Run	S_BM-2_SC_3	Intermittent	§404	HDD	Permanent ROW over HDD Profile
Unnamed Tributary to Coon Run	S_BM-12_SC_1	Intermittent	§404	HDD	Permanent ROW over HDD Profile
Unnamed Tributary to Kaskaskia River	S_BM-3_FA_2	Intermittent	§404	N/A	Construction ROW (crossed in pull string area for HDD of Kaskaskia River)
Unnamed Tributary to Kaskaskia River	s-b1-fa-08	Ephemeral	§404	HDD	Permanent ROW over HDD Profile
Kaskaskia River	S-BM-2_FA_1	Perennial	§404	HDD	Permanent ROW over HDD Profile
Unnamed Tributary to Kaskaskia River	s-b10-fa-04	Intermittent	§404	Open Cut	Construction and Permanent ROW
Cassar Creek	s-b1-fa-11	Perennial	§404	Open Cut	Construction and Permanent ROW
Unnamed Tributary to Cassar Creek	S_BM-12_FA_2	Ephemeral	§404	Open Cut	Construction and Permanent ROW

3.2.2. Groundwater

3.2.2.1. Affected Environment

Groundwater occurs within the Proposed Action Area of the USACE flowage easements and USACE project lands as both sand and gravel aquifers and bedrock aquifers (Illinois State Water Survey [ISWS], 2015). Although bedrock aquifers tend to have a greater distribution and be more continuous than sand and gravel aquifers, sand and gravel aquifers typically provide higher yields (ISWS, 2015). In Illinois sand and

gravel aquifers are the most important aquifers as they are the largest water source for domestic use, readily accessible due to their shallower nature, and they yield the largest volume of water (Voelker and Clarke, 1986; ISWS, 2015).

No water wells are located within the Proposed Action/Connected Action Areas. Additionally, no water source protection areas occur within the Proposed Action/Connected Action 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 remove 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 B). Action-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 B (SWPPP); the Proposed Action-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. Although most components of crude oil are relatively insoluble (Neff and Anderson, 1981), crude oil released into soil can migrate toward water where certain constituents can dissolve into groundwater or surface water in limited amounts. As a liquid, the product would travel along the path of least resistance both laterally and vertically at a rate determined by a number of factors including volume released, soil conditions (permeability, porosity, moisture, etc.), depth to groundwater, and the speed and effectiveness of response and remediation measures.

The DAPL Project would transport light sweet crude oil from the middle Bakken and upper Three Forks formations (Bakken). The Energy Information Administration (EIA) categorizes light sweet crude oil as having an American Petroleum Institute (API) gravity between 35° and 50° and less than 0.3 wt % sulfur. API gravity is a measure of how heavy or light liquid oil is compared to water: if its API gravity is greater than 10, it is lighter and floats on water. The oil extracted from the Bakken has an API gravity generally between 40° and 43° and a sulfur content of less than 0.2 weight percentage (wt %) (Turner, Mason and Company, 2014). Therefore, the Bakken oil has properties that fall within the mid-range of light sweet crude.

Most crude oil constituents are not very soluble in water. The dissolved concentration of water soluble compounds (e.g., benzene) is not controlled by the amount of oil in contact with the water, but by the concentration of the specific constituent in the oil (Charbeneau et al., 2000; Charbeneau, 2003; Freeze and Cherry, 1979). Studies of 69 crude oils found that benzene was the only aromatic or polycyclic aromatic hydrocarbon (PAH) compound tested that is capable of exceeding groundwater protection threshold values for drinking water (i.e., Maximum Contaminant Level or Water Health Based Limits) (Kerr et al., 1999 as cited in O'Reilly et al., 2001).

If no active ground water remediation activities were undertaken (see discussion below), dispersion, evaporation, dissolution, sorption, photodegradation, biodegradation, and natural attenuation ultimately would allow a return to preexisting conditions in both soil and groundwater.

Remediation

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 3.12 for additional information regarding reliability and safety and the proposed methods for monitoring the Proposed Action 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.

While a release of crude oil into groundwater or a surface waterbody has the potential to cause temporary environmental impacts, the likelihood of such an event is very low. Dakota Access has detailed provisions for protecting and mitigating potential impacts to water resources in Section 3.12 Reliability and Safety. Emergency response and remediation efforts have the potential for dramatically reducing the appreciable adverse environmental effects.

In the unlikely event of a spill during operations of the pipeline, impacts to water resources would be further mitigated by following the cleanup procedures and remediation activities described in the Dakota Access' FRP (Appendix G).

Specific clean-up procedures and remediation activities would be determined by groundwater remediation specialists within Dakota Access and contracted professional consultants. Each groundwater mitigation situation is unique and will be treated according to the actual circumstances present.

The first step in the mitigation process consists of the delineation of the plume to define the nature and extent of the release. If appropriate, Dakota Access would recover product as soon as practical to prevent the spread of contamination using excavators to remove the impacted soils, oil skimmers installed within collection wells, pumps, and storage containers or vacuum trucks at collection areas or some other method appropriate for the site conditions.

Dakota Access would develop a groundwater remediation plan in coordination with responsible federal, state or other governmental authorities. The proposed groundwater remediation system would be designed to treat the impacted groundwater by removing the released oil, converting it into harmless products, monitoring natural attenuation, etc.

Released product can often be physically removed from groundwater by several methodologies. The pump and treat method is one of the most widely used physical methods of ground water remediation and consists of pumping the groundwater to surface and then using either biological or chemical treatments to remove the oil. Another common method of removing floating hydrocarbon contaminants is the use of a monitoring-well oil skimmer. This method utilized a belt material with a strong affinity for hydrocarbons to bring the oil to the surface where it can be removed. A dual-phase vacuum extraction removes both contaminated groundwater and soil vapor. A high-vacuum extraction well is installed with its screened section in the zone of contaminated soils and groundwater to remove contaminants from above and below the water table. Released product can also be removed from groundwater by applying various chemical methodologies including ozone and oxygen gas injection, surfactant enhanced recovery, Biological treatment techniques can also be utilized including bioventing and bioaugmentation.

The ground water treatment remediation plan would be selected in coordination with responsible governmental authorities and may utilize a combination of technologies.

A preliminary evaluation of water well depths indicates that groundwater level in the vicinity of the Proposed Action Areas/Connected Action Areas ranges from approximately 23 feet to over 130 feet deep (Illinois State Geological Survey [ISGS], 2015). 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. Installation of the pipeline in the Proposed Action Areas/Connected Action Areas would not be expected to result in significant negative impacts on groundwater resources.

3.2.3. Wild and Scenic River Act

The Vermilion River (Middle Fork, located within Champaign and Vermillion Counties), is the only water body designated as wild and scenic within the state of Illinois (National Wild and Scenic River Council, 2016). The Proposed Action Area is not located within the vicinity (greater than 100 miles) of the Middle Fork of Vermilion River, thus no impacts to wild and scenic rivers is anticipated.

3.2.4. Wetlands

3.2.4.1. Affected Environment

Wetland data for the Proposed Action 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 extent of wetlands. These areas have been field-verified so 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: Midwest Region (USACE, 1987; 2010). 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).

3.2.4.2. Impacts and Mitigation

The routing analysis utilized to determine the crossing locations was designed to avoid impacts to sensitive environmental resources including wetlands, where practicable. If potential wetlands within the Proposed Action Areas/Connected Action Areas were confirmed during the 2014-2015 field verification and avoidance was not feasible, construction workspace was reduced to the extent practicable to minimize impacts.

The field wetland investigations conducted by Dakota Access identified palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO) wetlands within the Proposed Action Areas/Connected Action Areas. The wetlands associated with the Illinois River Proposed Action Areas/Connected Action Areas and the wetlands associated with the Kaskaskia River would be crossed via HDD; therefore, no trenching would occur within these wetlands. However, in the PFO wetlands the 50-foot-wide permanent DAPL easement, centered over the pipeline, would be cleared and maintained to facilitate inspections of the pipeline, operational maintenance, and compliance with the federal pipeline safety regulations. The remaining wetlands would be crossed via traditional open cut trench construction method. Following construction, Dakota Access would restore the construction ROW as close to pre-construction contours and naturally functioning condition as practicable. The temporary construction workspace would be allowed to revert to pre-construction conditions, however, the 50-foot-wide permanent DAPL easement, centered over the pipeline, may require infrequent maintenance clearing of encroaching woody vegetation to facilitate inspections of the pipeline, operational maintenance, and compliance with the federal pipeline safety regulations. Refer to Table 5 for a list wetlands crossed in the Proposed Action Areas/Connected Action Areas.

No wetlands would be permanently drained or filled in the Proposed Action Areas/Connected Action Areas. Impacts to PEM wetlands are expected to be short-term and minor. Impacts to the PFO wetlands outside of the 50-foot permanent DAPL easement are expected to be temporary and recovery to these wetlands would occur over time with the regrowth of trees via natural succession. The conversion of PFO wetlands to PEM wetlands would be permanent within a 30-foot maintained corridor. Temporary impacts and permanent conversion impacts to PFO wetlands would be offset through mitigation at an approved site authorized by the USACE Regulatory Branch. Additionally, Dakota Access would take measures to minimize the potential for contamination from an inadvertent spill of fuel or hazardous liquids during refueling or maintenance of construction equipment within wetlands. Fuel and all other hazardous materials would be stored in accordance with the requirements of Dakota Access' SPCC, and SWPPP (Appendix B). These documents also describe response, containment, and cleanup measures.

Table 5
Wetlands Crossed within the Proposed Action Areas/Connected Action Areas

ID	Type	Crossing Method	Impacts		
			Area	Type	Acres
w-b3-pi-01	PFO	HDD	Permanent ROW over HDD Profile	Conversion of PFO to PEM	0.19
w-b7-mo-01	PFO	HDD	Permanent ROW over HDD Profile	Conversion of PFO to PEM	0.97
W_BM-7_SC_4	PEM	HDD	Permanent ROW over HDD Profile	Avoided by HDD	0.0
W_BM-2_SC_1	PEM	HDD	Permanent ROW over HDD Profile	Avoided by HDD	0.0
W_BM-2_SC_2	PEM	HDD	Permanent ROW over HDD Profile	Avoided by HDD	0.0
W_BM-3_FA_1	PEM	HDD	Construction ROW	Temporary	0.29
			Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-3_FA_2	PSS	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-3_FA_4	PUB	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-12_FA_5	PEM	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-12_FA_6	PSS	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-2_FA_1	PSS	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-2_FA_2	PUB	HDD	Permanent ROW over HDD profile	Avoided by HDD	0.0
W_BM-2_FA_3	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	0.37
				Temporary within Construction ROW	0.59
W_BM-2_FA_5	PEM	Open Cut	Construction and Permanent ROW	Temporary within Construction ROW	3.21
w-b1-fa-07 (Part 1)	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	0.63
				Temporary within Construction ROW	0.99
W_BM-2_FA_6	PEM	Open Cut	Construction and Permanent ROW	Temporary within Construction ROW	1.27
w-b1-fa-07 (Part 2)	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	0.17
				Temporary within Construction ROW	0.3
W_BM-2_FA_7	PEM	Open Cut	Construction and Permanent ROW	Temporary	0.08
w-b1-fa-07 (Part 3)	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	1.03
				Temporary within Construction ROW	2.18
w-b1-fa-07 (Part 1)	PEM	Open Cut	Construction and Permanent ROW	Temporary	3.41
w-b1-fa-07 (Part 4)	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	0.55
				Temporary within Construction ROW	0.96
w-b1-fa-07 (Part 2)	PEM	Open Cut	Construction and Permanent ROW	Temporary	0.25
W_DT_FA_9	PEM	Open Cut	Construction and Permanent ROW	Temporary	3.38
W_BM-3_FA_9	PEM	Open Cut	Construction and Permanent ROW	Temporary	1.15
W_BM-7_FA_6	PEM	Open Cut	Construction and Permanent ROW	Temporary	0.54

Table 5 Wetlands Crossed within the Proposed Action Areas/Connected Action Areas					
ID	**Type**	**Crossing Method**	**Impacts**		
			Area	**Type**	**Acres**
W_BM-7_FA_5	PFO	Open Cut	Construction and Permanent ROW	Conversion of PFO to PEM within Permanent ROW	0.2
				Temporary within Construction ROW	0.34
Totals				**Conversion of PFO to PEM within the Permanent ROW**	**4.11**
				Temporary Impacts to PFO within the Construction ROW	**5.36**
				Temporary Impacts to PEM within the Construction ROW	**13.58**

EIs would monitor compliance with applicable wetland protection requirements during construction of the pipeline. The DAPL Project SPCC and SWPPP describe additional mitigation measures and contain illustrations of how sediment control devices are typically installed at wetland crossings. Temporary sediment control measures, such as silt fence installed at each crossing, would minimize the introduction of sediment into wetlands during construction and minimize the movement of spoil and sediment from surface runoff during and after construction. 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 (Appendix B).

Compensatory mitigation would be provided as required for temporary impacts and permanent conversion impacts to PFO wetlands. Impacts to wetlands would be offset through mitigation at an approved site authorized by the USACE Regulatory Branch (specifically the Middle Kaskaskia Mitigation Site, Clinton County, IL). The St. Louis Regulatory Branch is currently reviewing sites for authorization under Nationwide Permit 12 and will determine the appropriate mitigation as a condition of the permit verification. With the implementation of the measures above, impacts to wetlands in the vicinity of the levees and flowage easement crossings would be minimized. For compliance with Executive Order 11990 on Protection of Wetlands, there is no practicable alternative to construction in wetlands at the USACE project crossings.

3.2.5. Floodplain

3.2.5.1. 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), as amended by EO 13690, 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, approximately 22,402 feet of the Proposed Action Areas/Connected Action Areas is located within Zone A (the 100-year floodplain) of the Illinois River in Pike and Morgan Counties, and approximately 12,790 feet is located within the federal flowage easements north of Carlyle Lake.

3.2.5.2. Impacts and Mitigation

The Proposed Action 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. Any soil displaced by installation of the 30-inch pipeline within the Proposed Action Areas/Connected Action Areas would be removed from the floodplain and hauled to an upland location in order to ensure original floodplain elevations are restored. Avoidance of the floodplain would require lengthy and costly rerouting. Measures have been taken to minimize impacts to the floodplain and restoration to original contour would mean that the Proposed Action is not anticipated to have an effect on flood elevations. As a result, there is no practicable alternative to construction of the Dakota Access pipeline in the floodplain of the Illinois and Kaskaskia Rivers.

The Corps St. Louis District Hydrologic Engineering Section reviewed the proposed pipeline plans for the portion of the DAPL Project in the vicinity of the Illinois and Kaskaskia Rivers for compliance with the requirements of EO 11988 (Floodplain Management). Provided that the site topography is left at its natural ground elevation after construction and all excess material is hauled off site, the Hydrologic Engineering Section concluded that there are no flood risk and floodplain management concerns associated with the Proposed Action.

3.2.6. Levees

3.2.6.1. Affected Environment

Based on a search of the USACE National Levee Database and FEMA FIRM maps, three levees are crossed by the Proposed Action: the McGee Creek levee of the Illinois River, and the Coon Run levees of the Illinois River (specifically Coon Run Northwest levee and Coon Run Southeast levee). The McGee Creek levee is managed by and situated on land owned by the McGee Levee and Drainage District. The Coon Run levees are situated on private property but managed by the Coon River Drainage District.

3.2.6.2. Impacts and Mitigation

Because of the use of HDD construction methods to install the pipeline well below ground level, construction of the Dakota Access pipeline is not anticipated to have an effect on the operation of the McGee Creek or Coon Run levees. Dakota Access met with the McGee Creek Drainage and Levee District and the Coon Run Drainage and Levee District (collectively referred to as “Districts”) on 23 March 2016 to provide information and discuss the proposed pipeline crossings of each levee. The Districts retained Klingner & Associates, P.C. (Klingner) to provide an independent review of the proposed HDDs at each levee. Letters requesting additional information were received from Klingner on 26 April 2016 and responses were provided in correspondence dated 29 April 29 2016. As required by EC 1165-2-116, written statements endorsing the proposed alteration from the non-federal sponsors, the Levee Districts, must be received prior to issuing the 408 permission.

3.3. Vegetation, Agriculture, and Range Resources

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project and no impacts on vegetation, agriculture, and range resources would occur. However, if the objectives of the DAPL 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 Action. 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 USACE flowage easements, USACE projects, 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 Proposed Action Areas/Connected Action Areas is comprised mostly of cultivated crops and deciduous forest. Other present land cover types include developed areas, which are primarily roads, pasture/hay/grassland areas, open waters, woody wetlands, and emergent herbaceous wetlands. A description of each land cover type encountered within the Proposed Action Areas/Connected Action 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.

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 areas in the Proposed Action Areas/Connected Action Areas are associated with impervious surfaces of larger roads.

Emergent Herbaceous Wetland

Refer to Section 3.2.4, which provides a description of data obtained during delineations of the wetlands that would be impacted by the Proposed Action.

Woody Wetlands

Refer to Section 3.2.4, which provides a description of data obtained during delineations of the wetlands that would be impacted by the Proposed Action.

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 Illinois River and the Kaskaskia River.

3.3.1.2. Impacts and Mitigation

Temporary impacts on land cover would occur in essentially all areas within the construction footprint of the Proposed Action Areas, the vast majority of which would return to pre-construction land cover upon completion of construction. One exception is at the flowage easement Proposed Action Areas in forested areas along the permanent DAPL easement. This ROW would be maintained to prevent the regrowth of trees in the permanent DAPL easement. Impacts on cultivated crops make up the majority of temporary impacts and would return to cultivated crops post-construction.

Permanent impacts on land cover would be limited to the permanent ROW and is limited to routine vegetation maintenance including tree removal. 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 DAPL easements between the HDD workspaces.

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 DAPL Project, including the flowage easements Proposed Action 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 the McGee Creek levee or Coon Run levees; therefore, reseeding is not anticipated in these areas. However, if reseeding were to become necessary on the USACE projects, all activities would be conducted in accordance with requirements set by the USACE.

In non-agricultural areas, vegetation cleared from additional temporary workspace (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.

After completion of waterbody crossings, Dakota Access would revegetate disturbed stream banks in accordance with the 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.

Plants listed under the Section 7 of the Endangered Species Act (ESA) are discussed in Section 3.5 – Threatened, Endangered, Candidate, and Proposed Species.

3.3.2. Wildlife Resources

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project, and no impacts on wildlife resources would occur. However, if the objectives of the DAPL 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 DAPL 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.

3.3.3. Recreationally and Economically Important Species and Nongame Wildlife

3.3.3.1. Affected Environment

The Proposed Action region is home to diverse wildlife including a large number of mammal and bird species. Wildlife may be valued in a variety of capacities such as hunting and conservation, preservation, observation, and study. The primary big game species found in the Proposed Action Areas/Connected Action Areas is the white-tailed deer (*Odocoileus virginianus*). Furbearers and predators potentially occurring within the Area include coyote (*Canis latrans*), North American Beaver (*Castor canadensis*), American Badger (*Taxidea taxus*), Red Fox (*Vulpes vulpes*), Raccoon (*Procyon lotor*), Bobcat (*Lynx rufus*), American Mink (*Neovison vison*), Least Weasel (*Mustela nivalis*), and Muskrat (*Ondatra zibethicus*). Potential small mammal species occurring within the habitat types associated with the Proposed Action Areas/Connected Action Areas include Deer Mouse (*Peromyscus maniculatus*), Plains Pocket Gopher (*Geomys bursarius*), Striped Skunk (*Mephitis mephitis*), and Eastern Cottontail (*Sylvilagus floridanus*).

Avian species that may potentially use habitat occurring within the vicinity of the Proposed Action Areas/Connected Action Areas include Neotropical migrants, waterfowl, shorebirds, wading birds, and raptors, among others. The Proposed Action Areas/Connected Action Areas are within the Mississippi Flyway that is used by species for migration, stop-over habitat, nesting, brood rearing, and wintering. Migratory birds potentially using the habitat in the Proposed Action Areas/Connected Action Areas include the Acadian Flycatcher (*Empidonax virescens*), Bald Eagle (*Haliaeetus leucocephalus*), Bell's Vireo (*Vireo bellii*), Black-billed Cuckoo (*Coccyzus erythropthalmus*), Black-crowned Night-heron (*Nycticorax nycticorax*), Blue-winged Warbler (*Vermivora pinus*), Cerulean Warbler (*Dendroica cerulean*), Dickcissel (*Spiza americana*), Field Sparrow (*Spizella pusilla*), Fox Sparrow (*Passerella iliaca*), Henslow's Sparrow

(*Ammodramus henslowii*), Kentucky Warbler (*Oporornis formosus*), Least Bittern (*Ixobrychus exilis*), Loggerhead Shrike (*Lanius ludovicianus*), Northern Flicker (*Colaptes auratus*), Peregrine Falcon (*Falco peregrinus*), Pied-billed Grebe (*Podilymbus podiceps*), Prothonotary Warbler (*Protonotaria citrea*), Red-headed Woodpecker (*Melanerpes erythrocephalus*, Rusty Blackbird (*Euphagus carolinus*), Short-eared Owl (*Asio flammeus*), Willow Flycatcher (*Empidonax traillii*), Wood Thrush (*Hylocichla mustelina*), and Worm Eating Warbler (*Helmitheros vermivorum*). Game birds potentially using the habitat in the Proposed Action Areas/Connected Action Areas include the Wild Turkey (*Meleagris gallapavo*), northern bobwhite (*Colinus virginianus*), American Woodcock (*Scolopax minor*), Common Snipe (*Gallinago gallinago*), and Mourning Dove (*Zenaida macroura*). The diversity of avian species that may seasonally, periodically, or incidentally occur within the Proposed Action Areas/Connected Action Areas is high.

Numerous species of reptiles and amphibians may also occur within the vicinity of the Proposed Action Areas/Connected Action Areas. Some amphibian species that may be expected to occur in the vicinity of the Proposed Action Areas/Connected Action Areas include the Northern Leopard Frog (*Lithobates pipiens*), Tiger Salamander (*Ambystoma tigrinum*), and Chorus Frog (*Pseudacris* spp.). Reptile species that may be expected to occur within the Proposed Action Areas/Connected Action Areas include Common Snapping Turtle (*Chelydra serpentina*), Painted Turtle (*Chrysemys picta*), Common Garter Snake (*Thamnophis sirtalis*), and Southern Black Racer (*Coluber constrictor priapus*) among others (Hoberg and Gause, 1992).

3.3.3.2. 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 Proposed Action Areas/Connected Action Areas 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 vegetation 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 DAPL easement to improve visibility and remove encroaching trees would be performed in compliance with PHMSA requirements. The permanent conversion of areas with trees to herbaceous cover would be a potential long-term impact to wildlife (i.e. habitat fragmentation caused by the ROW). This impact is expected to be minimal, as it pertains to extremely small portions of the permanent DAPL easement (30-foot-wide DAPL easement through forested wetlands) as compared to the available adjacent undisturbed habitats. While fragmentation of habitat can be a concern for some species, the narrow width of the 30-foot-wide maintained corridor is not anticipated to create an impassible barrier for wildlife that utilize these habitats. Further, some wildlife species may benefit by increased diversity of vegetation that would grow within and adjacent to the maintained ROW. Overall, impacts to wildlife in the Proposed Action Areas and Connected Action Areas are anticipated to be very small. Impacts to recreation or other usage of wildlife and the existing habitats by people would be negligible as a result of the small areas of impact relative to the amount of suitable habitat in surrounding areas.

Wildlife listed under the Section 7 of the Endangered Species Act (ESA) are discussed in Section 3.5 – Threatened, Endangered, Candidate, and Proposed Species.

3.4. Aquatic Resources

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project, and no impacts on aquatic resources would occur. However, if the objectives of the DAPL 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 DAPL 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.

3.4.1. Habitat and Communities

3.4.1.1. Affected Environment

The Proposed Action crosses the Illinois River approximately 1.8 miles southwest of Meredosia. At this location, the crossing distance of the Illinois River is approximately 700 feet. The channel of the Illinois River is well defined and slow-moving. The Illinois River confluence with the Mississippi River is approximately 70 miles south of proposed Illinois River crossing location. The Illinois River has shown an improved fishery since the late 1970s and is home to several fish species, including black crappie, bluegill, brown bullhead, channel catfish, largemouth bass, sauger, walleye, white bass, and white crappie (Illinois Department of Natural Resources [ILDNR], 2015a). In addition, the Proposed Action crosses an unnamed perennial tributary to the Illinois River. This channelized feature functions as a drainage ditch within an agricultural setting, and will be crossed by HDD in conjunction with the Illinois River crossing. Coon Run, which also functions as and agricultural drainage ditch is situated between the Coon Run levees. Coon Run and three intermittent tributaries would be crossed by HDD in conjunction with the crossing of the Coon Run levees.

The Proposed Action crosses the Kaskaskia River approximately 3.75 miles west of Shobonier. At this location, the crossing distance of the Kaskaskia River is approximately 90 feet. The Kaskaskia River is the largest stream found entirely within the state of Illinois. The Proposed Action crosses the Kaskaskia River upstream from the Carlyle Lake reservoir. The Kaskaskia River supports several fish species, including black crappie, blue catfish, bluegill, channel catfish, crappie, flathead catfish, largemouth bass, sauger, smallmouth bass, walleye, and white bass (ILDNR, 2015b). One ephemeral tributary to the Kaskaskia River would be crossed in conjunction with the HDD of the river itself. Two intermittent tributaries to the Kaskaskia River would also be crossed to the east and west of the HDD area. These intermittent features appear to be channelized relict stream channels that primarily function as agricultural drainage ditches. Cassar Creek (a perennial stream) and an ephemeral tributary to Cassar Creek are crossed by the Proposed Action to the south and east of the Kaskaskia River crossing. Cassar Creek provides similar aquatic habitat as the Kaskaskia River, though on a smaller scale and is not likely to support as vibrant of a fishery. Amphibians can be found along the shores and nearby riparian areas of the Illinois and Kaskaskia Rivers, as well as the smaller waterways and ditches.

3.4.1.2. Impacts and Mitigation

The Illinois River, Coon Run, Kaskaskia River, Cassar Creek, and their tributaries are aquatic resources that have potential to be impacted by the Proposed Action. At the Illinois River, Coon Run, and Kaskaskia River

crossings, subsurface disturbing activities would be set back from the river/stream banks at the HDD entry and exit locations. This provides a buffer of undisturbed land between active construction and the rivers. Along the Illinois River, the setbacks are approximately 0.55 miles from the west bank and 0.63 miles from the east bank. For the Kaskaskia River, the setbacks are approximately 0.47 miles from the west bank and 0.22 miles from the east bank. These setbacks essentially eliminate the risk for sediment to be transported from the workspace into the rivers during precipitation events. Turbidity, if it reaches the waterbodies, could increase the local turbidity and sediment load which 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 in the SWPPP (Appendix B), 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 the Illinois River and its tributary, Coon Run and its tributaries, and the Kaskaskia River and a tributary. Each of these features and method of crossing is detailed in Table 4. Since the pipeline would be installed without disturbing the aquatic and benthic environments of these features, no impacts are anticipated. 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 C) establishes monitoring procedures and prescribes measures to be implemented to minimize the impact in the event it occurs. All HDD operations conducted for crossings the Illinois River and Kaskaskia River 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.

Two unnamed tributaries to the Kaskaskia River, Cassar Creek, and a tributary to Cassar Creek (see Table 4) all drain into the Kaskaskia River within the federal flowage easements in Fayette County. To cross these waterbodies, equipment would operate from the banks of the stream to the maximum extent practicable to excavate a trench. Flow would be maintained at all times and BMPs would be utilized to avoid or minimize the potential for sedimentation within the channel. Excavated material from the trench would be placed on the bank above the ordinary high water mark for use as backfill. The pipe segment would be prefabricated and weighted, as necessary, to provide negative buoyancy and placed below scour depth. Typical backfill cover requirements would be met, contours would be restored within the waterbody, and the banks would be stabilized via seeding and/or the installation of erosion control matting or riprap. Excess excavated materials would be distributed in an upland area in accordance with applicable regulations.

In addition to the crossing of these water bodies, aquatic resources could also be impacted during water withdrawal from the Illinois and Kaskaskia Rivers, 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 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 Proposed Action would be related to releases from the pipeline. For portions of the pipeline installed beneath the Illinois River and Kaskaskia River, 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 FRP, which is under development and would be issued prior to operating the Proposed Action, 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 USACE. The FRP is discussed under Section 3.2.1.2 and a draft of the FRP is included in Appendix G.

3.5. Threatened, Endangered, Candidate, and Proposed Species

The Endangered Species Act (ESA) directs all federal agencies to work to conserve species listed as endangered and threatened. The DAPL Project ROW includes crossing USACE projects and flowage easements, thus triggering consultation under Section 7 of the ESA. This section serves as the Biological Assessment or written analysis documenting the USACE conclusions and the rationale to support those conclusions regarding the effects of the Proposed Action on federally protected plant and wildlife resources within the Proposed Action Areas/Connected Action Areas.

3.5.1. Affected Environment

Nine federally listed species have been identified in the USACE St. Louis District Action Areas within Pike, Morgan, Scott, and Fayette counties, Illinois. Of the nine federally listed species, there are three mammals, two mussels, one bird, and three plants. Additionally, one candidate inspect species is listed in Fayette County, Illinois. Species lists were obtained from the USFWS website (https://www.fws.gov/midwest/endangered/section7/sppranges/illinois-cty.html) on 12 January 2016, and the USFWS Information for Planning and Conservation website (IPaC; https://ecos.fws.gov/ipac) on 4 February 2016.

3.5.1.1. Northern Long-Eared Bat

Northern Long-Eared Bats (*Myotis septentrionalis*), listed as federally threatened, 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. While the Northern Long-Eared Bat is known or likely to occur within the four counties crossed by the Proposed Action Areas/Interrelated Activity Areas (Pike, Morgan, Scott, and Fayette Counties), no critical habitat has been designated in these counties. 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 (dbh) 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). The primary threat to the Northern Long-Eared Bat is WNS. The disease is caused by the fungus *Pseudogymnoascus destructans* which colonizes the bat's skin. No obvious treatment or means of preventing transmission is known, and some species have declined >90% within five years of the disease reaching a site.

Impacts to hibernacula, loss or degradation of summer habitat, and wind farm operation may become important factors affecting this bat's viability until ways to address white-nose syndrome are found. However, no significant population declines have been observed due to these sources.

3.5.1.2. Indiana Bat

The Indiana Bat (*Myotis sodalis*), listed as federally endangered, has a range in the U.S. spanning from Iowa to Virginia, and from Maine to as far south as Alabama. The Indiana Bat is known or likely to occur within the four counties crossed by the Proposed Action Areas/Connected Action Areas (Pike, Morgan, Scott, and Fayette Counties); however no critical habitat has been designated in these counties.

In addition to the preferred wintering habitat of caves, Indiana Bats will also utilize using abandoned mines and other cavelike man-made structures as hibernacula (USFWS, 2009). In the spring, the bats can migrate hundreds of miles to their summer habitats, with females departing the hibernacula before the males (USFWS, 2007). Females form maternity colonies that include 10 to 20 roost trees, and generally only use up to three of the trees as primary roost sites. The females return to the same roost trees each year, and are thought to replace lost primary roost sites with one of the other 10 to 20 roost trees used the previous year (USFWS, 2007). Researchers have documented female Indiana Bats as having a preference for dead or dying deciduous trees with slabs of exfoliating bark or narrow cracks within the tree. Male Indiana Bats usually remain closer to their hibernaculum, using a wider variety of roosting sites than females. Unlike females, males are mostly solitary when roosting in the summer and are found roosting in smaller trees more often than females (USFWS, 2007). The Indiana Bat population has suffered from habitat loss/degradation, forest fragmentation, winter disturbance, and environmental contaminants like insecticides, oil spills, WNS, and polychlorinated biphenyls (PCBs).

3.5.1.3. Gray Bat

The range of the Gray Bat (*Myotis grisescens*), listed as Federally endangered, is concentrated in the limestone karst areas of the southeastern states of Alabama, Kentucky, Arkansas, Missouri, and Tennessee, and some have been found in Indiana (USFWS, 2009b; USFWS, 1982). It is known or likely to occur within one Illinois County crossed by the Proposed Action Areas/Interrelated Activity Areas (Pike County), and no critical habitat for the Gray Bat has been designated in the county. Cave disturbance by humans is a major issue threatening this species; habitat loss to flooding and commercialization of caves negatively impacts the Gray Bat (USFWS, 2009b; USFWS, 2014a).

Gray Bats migrate to their hibernacula in the fall, and mate September through October (NatureServe, 2014). These bats roost in cooler caves in the winter and warmer caves in the summer; in the winter, Gray Bats hibernate in deep vertical caves that trap large amounts of cold air (USFWS, 2009b). Typically, bats select summer caves located near open waters such as streams, rivers, or lakes. Gray Bats are opportunistic insectivores, mostly feeding on aquatic insects and as such rely heavily on water bodies as foraging habitat, tending to feed within 10 feet of the water's surface (NatureServe, 2014; USFWS, 2009b).

3.5.1.4. Higgins Eye Pearlymussel

Higgins Eye Pearlymussel (*Lampsilis higginsii*), listed as Federally endangered, occurs in the Upper Mississippi River drainage, and prefers large freshwater rivers with deep water and velocities less than 1 meter per second (USFWS, 2004a). In the Proposed Action Areas/Interrelated Activity Areas, the mussel is known or likely to occur in the Pike County. No occurrences of Higgins Eye Pearlymussel have been recorded within the Proposed Action Areas/Interrelated Activity Areas in Illinois. Critical habitat for the Higgins Eye Pearlymussel has not been designated in any of the counties that are crossed by the Proposed Action.

Higgins Eye Pearlymussel occur in a variety of stable substrates ranging from boulders to sand; however, they do not occupy areas with firmly packed clay, flocculent silt, organic material, bedrock, concrete, or unstable sand. Current threats to the Higgins Eye Pearlymussel include habitat alteration, water quality, commercial harvest or illegal poaching, and the invasive zebra mussel (*Dreissena polymorpha*). The zebra mussel is a threat because it can attach to the Higgins Eye Pearlymussel shell and inhibit movement, burrowing, and opening or closing of shells. The zebra mussel also competes with the Higgins Eye Pearlymussel and other native mussel species for food (USFWS, 2004a; USFWS, 2004b).

3.5.1.5. Spectaclecase Mussel

Historically, the Spectaclecase Mussel (*Cumberlandia monodonta*), listed as Federally endangered, occurred in at least 44 streams in the Mississippi, Ohio, and Missouri River basins in 14 states, however, is now believed to be found in a total of 20 waterways within 14 states, including Illinois (USFWS, 2014b; USFWS, 2014c). Within the Proposed Action Areas/Interrelated Activity Areas it is known or likely to occur in Pike County. No occurrences of Spectaclecase Mussel have been recorded within the proposed DAPL ROW in Illinois.

The Spectaclecase Mussel occurs in a variety of substrates including mud, sand, gravel, cobble, and boulders in relatively shallow riffles and shoals with a slow to swift current. Spectaclecase Mussels are typically found aggregated in firm mud between large rocks; however, they have been occasionally documented in tree stumps, root masses, and in beds of rooted vegetation. The decline of the Spectaclecase Mussel population is attributed to habitat loss and degradation including impoundments, channelization, chemical contaminants, mining, and sedimentation.

3.5.1.6. Piping Plover

Piping Plovers (*Charadrius melodus*), listed as Federally endangered, 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. Of the four counties within the Proposed Action Areas/Interrelated Activity Areas, the Piping Plover is only known or likely to occur in Fayette County. No critical habitat been designated in or near the Proposed Action Areas/Interrelated Activity Areas.

3.5.1.7. Decurrent False Aster

The Decurrent False Aster (*Boltonia decurrens*) was federally listed as threatened by the USFWS on November 14, 1988 (USFWS, 1988a). This species is a herbaceous early successional floodplain plant that colonizes disturbed sites along the Illinois River and its confluence with the Mississippi River (USFWS, 1988a). Within counties crossed by the Proposed Action, the Decurrent False Aster is only known or likely

to occur within Pike, Morgan and Scott Counties. No occurrences of Decurrent False Aster, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity Areas.

Adaptations exhibited through the life history of the Decurrent False Aster only allows for a narrow species distribution defined by the floodplain of the Illinois River (USFWS, 2012a). Therefore, the preferred habitat of this species is characterized as disturbed ground bordering sloughs, ditches, ponds, wet prairies, shallow marshes, and open forests associated with the river (USFWS, 1988a). The Decurrent False Aster relies on regular flooding events, not only for seed dispersal, but for the creation of new habitat as the result of the removal of competing species (USFWS, 1990).

Historically, the range of the Decurrent False Aster spanned approximately 250 miles along the Illinois River, ranging from LaSalle, Illinois, to the Mississippi-Illinois River confluence (USFWS, 1988a). An Illinois River survey conducted in 1989 located 18 communities of Decurrent False Aster within Jersey, Scott, Cass, Morgan, Schuyler, Fulton, Tazewell, and Marshall Counties, and along the Mississippi River in St. Clair County (USFWS, 1990). Surveys conducted in 2002 revealed an increase of up to 26 Decurrent False Aster populations; however, the number of individual plants has decreased from more than 1 million to 378,887 (USFWS, 2012a).

3.5.1.8. Eastern Prairie Fringed Orchid

The Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) was federally listed as threatened under the ESA on September 28, 1989 (USFWS, 2010). The Eastern Prairie Fringed Orchid is known or likely to occur within all four Illinois counties crossed by the Proposed Action (Pike, Morgan, Scott, and Fayette Counties). No occurrences of Eastern Prairie Fringed Orchid, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity Areas.

This species inhabits a wide variety of areas, ranging from mesic prairie to wetlands such as sedge meadows, marsh edges, and bogs (USFWS, 1999). An area with full sunlight, grassy habitat, and minimal woody encroachment is ideal for the Eastern Prairie Fringed Orchid (USFWS, 2005). Additionally, this species requires habitat that is not periodically disturbed (e.g., no row-crop agriculture or herbicide usage). Historically, this orchid existed in 33 Illinois counties, but now occurs in only six counties near Chicago, with single populations found in cemetery prairies located in eastern and west-central Illinois counties (USFWS, 1999).

Threats to the success of this species consist of converting suitable habitat to croplands and pasture, herbicide usage on ROWs, land alteration by ditching and diking, woody vegetation encroachment, competition from invasive plant species, and poaching and trampling by people (Michigan Natural Features Inventory [MNFI], 2000; USFWS, 2010). Currently, active management by physically removing brush and weeds or prescribing burns are the best options for controlling Eastern Prairie Fringed Orchid habitat depending on the level of woody vegetation encroachment and presence of specific invasive species (USFWS, 2010).

3.5.1.9. Prairie Bush Clover

The Prairie Bush Clover (*Lespedeza leptostachya*) was listed as threatened on January 9, 1987 (USFWS, 1988b). The Prairie Bush Clover is known or likely to occur within one Illinois county crossed by the Proposed Action (Fayette County). No occurrences of Prairie Bush Clover, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity Areas.

Ideal habitat for the Prairie Bush Clover appears to be dry-mesic prairie consisting of fine silty loam, fine sandy loam, or clay loam with a gentle slope facing north. This species is capable of inhabiting both undisturbed and disturbed areas (USFWS, 1988b). The range of the Prairie Bush Clover is specific to the tallgrass prairie region of the Midwest. Today, this species can be found in the states of Iowa, Illinois, Minnesota, and Wisconsin (Minnesota Department of Natural Resources [MNDNR], 2015).

The majority of these plants are found close to the Des Moines River Valley in southwestern Minnesota and the Iowa lakes region in northwestern Iowa (MNDNR, 2015). Threats for survival of the Prairie Bush Clover consist of habitat conversion, livestock grazing, herbicide application, small population size, succession, low recruitment, invasive species, and gravel mining/extraction (USFWS, 2009c).

3.5.1.10. Rattlesnake-Master Borer Moth

The Rattlesnake-Master Borer Moth (*Papaipema eryngii*), listed as a candidate species, is a large chocolate-colored moth with bold white orbicular and axillary markings. The Rattlesnake-Master Borer Moth occurs in 16 populations in five states, including Arkansas, Illinois, Kentucky, North Carolina and Oklahoma. Within the Proposed Action Areas/Interrelated Activity Areas, the Rattlesnake-Master Borer Moth may be found in Fayette County. The moth is named for its reliance on the rattlesnake-master (*Eryngium yuccifolium)*, a prairie plant which is its only food source. Adult borer moths lay their eggs in the vicinity of the plant in the fall where the eggs overwinter in the prairie duff. In the spring, larvae emerge from the eggs and feed on leaves of the rattlesnake-master until they are ready to burrow into the root of the plant. The moth stays in the burrow until late summer when it pupates and adults emerge again in mid-September. Rattlesnake-Master Borer Moths depend on undisturbed prairie that contains their food source, and loss of prairie habitat to other land uses is likely causing populations to decline. A population of 100-1000 rattlesnake-master plants need to be present for the Rattlesnake-Master Borer Moth to persist (USDA, 2003).

3.5.2. Impacts and Mitigation

Dakota Access conducted pedestrian surveys of the workspace within the Action Areas between September 2014 and July 2015 to assess suitable habitat for listed species. Given the limited scope of this Proposed Action, minimization measures, and the implementation of specialized construction techniques, USACE has determined that the Proposed Action would have "*no effect*" on the Gray Bat, Higgins Eye Pearlymussel, Spectaclecase Mussel, Piping Plover, Decurrent False Aster, Eastern Prairie Fringed Orchid, Prairie Bush Clover, and Rattlesnake-Master Borer Moth within the Proposed Action Areas/Interrelated Activity Areas. In addition, USACE has determined that the Proposed Action "*may affect, but is not likely to adversely affect*" the Northern Long-Eared Bat and Indian Bat within the Proposed Action Areas/Interrelated Activity Areas. Table 6 lists the impact determinations of the protected species with potential to occur within the Proposed Action Areas and Interrelated Activity Area. A summary of habitat evaluations and the basis for the determination of impacts for each listed species is provided below.

Table 6 Federally Listed Species with Potential to Occur within the Proposed Action Areas/Interrelated Activity Areas						
Species	**Status**	**County Listed**				**Impact Determination**
		Pike	**Morgan**	**Scott**	**Fayette**	
Mammals						
Northern Long-Eared Bat	Threatened	X	X	X	X	May affect, not likely to adversely affect
Indiana Bat	Endangered	X	X	X	X	May affect, not likely to adversely affect
Gray Bat	Endangered	X				No Effect
Mussels						
Higgins Eye Pearlymussel	Endangered	X				No Effect
Spectaclecase Mussel	Endangered	X				No Effect
Birds						
Piping Plover	Endangered				X	No Effect
Plants						
Decurrent False Aster	Threatened	X	X	X		No Effect
Eastern Prairie Fringed Orchid	Threatened	X	X	X	X	No Effect
Prairie Bush Clover	Threatened				X	No Effect
Insects						
Rattlesnake-Master Borer Moth	Candidate				X	No Effect

3.5.2.1. Northern Long-Eared Bat

The USFWS published the final 4(d) rule for the Northern Long-Eared Bat in the *Federal Register* on January 14, 2016. The Northern Long-Eared Bat 4(d) rule prohibits incidental take that may occur from tree removal activities within 150 feet of a known occupied maternity roost tree during the pup season (June 1 to July 31) or within a 1/4 mile of a hibernation site, year round.

The Proposed Action Areas/Interrelated Activity Areas in Illinois are within the WNS buffer zone. As such, habitat assessments and acoustic and mist net surveys were completed by Dakota Access in the Summer of 2015 to assess the potential for the Northern Long-Eared Bat to occur in the Proposed Action Areas/Interrelated Activity Areas, the USFWS was coordinated with in performing these surveys. The results of the habitat assessment field surveys within the Proposed Action Areas/Interrelated Activity Areas indicate that potential roosting habitat for Northern Long-Eared Bats is present within the pipeline ROW within the profile of the HDD alignment underneath the forested banks of the Illinois River in Pike and Morgan Counties, and as it crosses the federal flowage easements north of Carlyle Lake in Fayette County. Acoustic and mist-net surveys were conducted to determine presence of the Northern Long-Eared Bat. Based on the results of these evaluations, no active roost trees and no Northern Long-Eared Bat colonies were identified within the Proposed Action Areas/Interrelated Activity Areas. To further minimize the potential for impacts to this species, wintertime clearing, between 1 October and 31 March,

would be performed to remove potential roost trees identified within the Proposed Action Areas/Interrelated Activity Areas, provided all regulatory, landowner, and access to these trees is available.

The decline of populations of Northern Long-Eared Bats is largely attributed to the spread of WNS. The operation and maintenance of the DAPL within Proposed Action Areas/Interrelated Activity Areas would not further contribute to the spread of WNS and is not anticipated to result in incidental take in violation of the final 4(d) rule. Following construction, the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Containment and remediation of spills would prevent long-term detrimental effects to potential habitats that may be viable to support the Northern Long-Eared Bat. Further, since no known maternity colonies or hibernacula are known to occur within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a spill or leak during operation is not anticipated to adversely affect maternity roosts or hibernacula of the Northern Long-Eared Bat.

Based on the avoidance and minimization measures, literature reviews, field investigations, and habitat types present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the proposed Action "*may affect, but is not likely to adversely affect*" the Northern Long-Eared Bat.

3.5.2.2. Indiana Bat

The habitat assessment field surveys within Proposed Action Areas/Interrelated Activity Areas in Illinois indicate that potential roosting habitat for the Indiana Bat (live trees and dead or dying trees with loose bark, exfoliating bark, cracks, crevices, hollows, or cavities) is present within the proposed DAPL ROW within the profile of the HDD alignment underneath the forested banks of the Illinois River in Pike and Morgan Counties, and as it crosses the federal flowage easements north of Carlyle Lake in Fayette County. Acoustic and mist-net surveys were conducted to determine presence of the Indiana Bat. Based on the results of these evaluations, no active roost trees or Indiana Bat colonies were identified within the Proposed Action Areas/Interrelated Activity Areas. To further minimize the potential for impacts to this species, wintertime clearing, between 1 October and 31 March, would be performed to remove potential roost trees within the Proposed Action Areas/Interrelated Activity Areas, provided all regulatory, landowner, and access to these trees is available.

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30 feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Containment and remediation of spills would prevent long-term detrimental effects to potential habitats that may be viable to support the Indiana Bat. Further, since no maternity colonies or hibernacula are known to occur within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a spill or leak during operation is not anticipated to adversely affect maternity roosts or hibernacula of the Indiana Bat.

Based on the avoidance and minimization measures, literature reviews, field investigations, and habitat types present in the Proposed Action Areas, USACE has determined that the Proposed Action "*may affect, but is not likely to adversely affect*" the Indiana Bat.

3.5.2.3. Gray Bat

The results of the habitat assessment field surveys indicate that no potential habitat would be affected by the Proposed Action. Furthermore, no known Gray Bat roost caves have been previously documented within the Proposed Action Areas/Interrelated Activity Areas and no caves were identified during field investigations. Additionally, no known sinkholes, indicated of karst terrain were are known to occur within the Proposed Action Areas/Interrelated Activity Areas (Davies, 1984).

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Since no potential roost caves or karst features are located within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a leak or spill is not expected to impact the Gray Bat.

Based on the avoidance and minimization measures, literature reviews, field investigations, and habitat types present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Gray Bat.

3.5.2.4. Higgins Eye Pearlymussel

The results of habitat assessment field surveys indicate that potentially suitable habitat for the Higgins Eye Pearlymussel is only present where the Proposed Action crosses the Illinois River in Pike County. Additionally, an **Eco**logical **C**ompliance **A**ssessment **T**ool (EcoCAT) assessment was conducted on 2 February 2016 for the Section 408 Proposed Action Areas/Interrelated Activity Areas. The results contained no records of Higgins Eye Pearlymussels in the vicinity of the Proposed Action location. The Illinois River would be crossed using a HDD construction method, avoiding impacts to the Higgins Eye Pearlymussel and its potential habitat. Additionally, The HDD profile was designed to a depth to help provide adequate clearance under the McGee Creek levee, the Illinois River (GeoEngineers, 2015a), and the Coon Run levees (GeoEngineers, 2015b), thereby reducing the risk of experiencing inadvertent drilling fluid returns in the vicinity of these features. In addition, the bottom tangent of the HDD profile for the Coon run levees was sloped slightly to attempt to increase the depth of the profile yet still avoid intersecting the soil/bedrock interface below (GeoEngineers, 2015b).

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. The permanent DAPL easement for the section of pipeline installed by HDD under the Illinois River would only be maintained to prevent the regrowth of trees. No required maintenance activities would result in instream impacts or impacts to the bed or adjacent banks of the Illinois River. In addition, Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the case of HDD crossings, Dakota Access will be providing line pipe steel with a 0.625-inch wall thickness. This thicker line pipe provides would allow a higher operating pressure that

is approximately 46% stronger than the thickness required by regulation (Wood Group Mustang, 2015). It is unlikely that a leak or spill would occur with the Proposed Action Areas/Interrelated Activity Areas and even less likely to occur in the HDD areas.

Based on the avoidance and minimization measures, literature reviews, field investigations, and EcoCAT results for the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Higgins Eye Pearlymussel.

3.5.2.5. Spectaclecase Mussel

The results of habitat assessment field surveys indicate that potentially suitable habitat for the Spectaclecase Mussel is only present where the Proposed Action crosses the Illinois River in Pike County, Illinois. Additionally, an EcoCAT assessment was conducted on 2 February 2016 for the Section 408 Proposed Action Areas/Interrelated Activity Areas. The results contained no records of Spectaclecase Mussels in the vicinity of the Proposed Action location. The Illinois River would be crossed using a HDD construction method, avoiding impacts to the Spectaclecase Mussel and its potential habitat. Additionally, The HDD profile was designed to a depth to help provide adequate clearance under the McGee Creek levee, the Illinois River (GeoEngineers, 2015a), and the Coon Run levees (GeoEngineers, 2015b), thereby reducing the risk of experiencing inadvertent drilling fluid returns in the vicinity of these features. In addition, the bottom tangent of the HDD profile for the Coon run levees was sloped slightly to attempt to increase the depth of the profile yet still avoid intersecting the soil/bedrock interface below (GeoEngineers, 2015b).

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. The permanent DAPL easement for the section of pipeline installed by HDD under the Illinois River would only be maintained to prevent the regrowth of trees. No required maintenance activities would result in impacts to the bed or adjacent banks of the Illinois River. In addition, Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the case of HDD crossings, Dakota Access will be providing line pipe steel with a 0.625-inch wall thickness. This thicker line pipe provides would allow a higher operating pressure that is approximately 46% stronger than the thickness required by regulation (Wood Group Mustang, 2015). It is unlikely that a leak or spill would occur with the Proposed Action Areas/Interrelated Activity Areas and even less likely to occur in the HDD areas.

Based on the avoidance and minimization measures, literature reviews, field investigations, and EcoCAT results for the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Spectaclecase Mussel.

3.5.2.6. Piping Plover

The Piping Plover nests on sparsely vegetated sandbars and beaches of large rivers and is known or likely to occur within Fayette County. Based on the results of the habitat assessment field surveys, the proposed DAPL does not cross potential habitat for the Piping Plover. It is more probable that potentially suitable habitats for the Piping Plover are located more than five miles to the south of the Proposed Action Areas/Interrelated Activity Areas in Fayette County, along the shorelines of Carlyle Lake. Additionally, an EcoCAT assessment was conducted on 2 February 2016 for the proposed Section 408 Action Areas. The results contained no records of Piping Plovers in the vicinity of the Proposed Action location. The Kaskaskia River would be crossed using a HDD construction method.

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Containment and remediation of spills would prevent long-term detrimental effects to potential habitats that may be viable to support the Piping Plover 5 miles south at Carlyle Lake. Since no potential habitat for Piping Plover is located within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a leak or spill would not be expected to impact suitable habitats for the Piping Plover.

Based on the avoidance and minimization measures, literature reviews, field investigations, and EcoCAT results for the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the proposed would have *"no effect"* on the Piping Plover.

3.5.2.7. Decurrent False Aster

The McGee Creek levee, Illinois River, and the Coon Run levees would be crossed using a HDD construction method. No occurrences of Decurrent False Aster, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity Areas. Additionally, an EcoCAT assessment was conducted on 2 February 2016 for the proposed Section 408 Action Area. The results contained no records of Decurrent False Aster in the vicinity of the Proposed Action Areas/Interrelated Activity Areas.

The habitat assessment field surveys indicate that preferred habitat for the Decurrent False Aster would not be affected by the Proposed Action. The Proposed Action occurs primarily in agricultural fields, restored grassland, and forested areas within the known range of this species.

Following construction the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within the Proposed Actions Areas/Interrelated Activity Areas. The permanent DAPL easement for the section of pipeline installed by HDD under the McGee Creek levee, Illinois River, and the Coon Run levees would only be maintained to prevent the regrowth of trees. No required maintenance activities would result in impacts to the banks of the Illinois River. In addition, Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the case of HDD crossings, Dakota Access will be providing line pipe steel with a 0.625-inch wall thickness. This thicker line pipe provides would allow a higher operating pressure that is approximately 46% stronger than the thickness required by regulation (Wood Group Mustang, 2015). It is unlikely that a leak or spill would occur with the Proposed Action Areas/Interrelated Activity Areas and even less likely to occur in the HDD areas.

Based on the avoidance and minimization measures, literature reviews, field investigations, EcoCAT results, and habitat types present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Decurrent False Aster.

3.5.2.8. Eastern Prairie Fringed Orchid

The McGee Creek levee, Illinois River, the Coon Run levees, and the Kaskaskia River would be crossed using a HDD construction method. The remainder of the proposed pipeline alignment within the flowage easement north of Carlyle Lake would be trenched. No occurrences of Eastern Prairie Fringed Orchid, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity

Areas. Additionally, an EcoCAT assessment was conducted on 2 February 2016 for the Section 408 Action Areas/Interrelated Activity Areas. The results contained no records of Eastern Prairie Fringed Orchid in the vicinity of the Proposed Action Areas/Interrelated Activity Areas. Furthermore, the habitat assessment field surveys indicate that preferred habitat for the Eastern Prairie Fringed Orchid would not be affected by the Proposed Action. The Proposed Action occurs primarily in agricultural fields, restored grasslands, and forested areas within the known range of this species. Following construction, the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Since no potential habitat for the Eastern Prairie Fringed Orchid is located within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a leak or spill would not be expected to impact suitable habitats for the Eastern Prairie Fringed Orchid.

Based on the avoidance and minimization measures, literature reviews, field investigations, EcoCAT results, and habitat types present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Eastern Prairie Fringed Orchid.

3.5.2.9. Prairie Bush Clover

The Kaskaskia River would be crossed using a HDD construction method. The remainder of the proposed pipeline alignment within the flowage easement north of Carlyle Lake would be trenched. No occurrences of Prairie Bush Clover, or any designated critical habitat, have been recorded within the Proposed Action Areas/Interrelated Activity Areas. Additionally, an EcoCAT assessment was conducted on 2 February 2016 for the proposed Section 408 Action Areas. The results contained no records of Prairie Bush Clover in the vicinity of the Proposed Action Areas/Interrelated Activity Areas. Furthermore, the habitat assessment field surveys indicate that preferred habitat for Prairie Bush Clover would not be affected by the Proposed Action. The Proposed Action occurs primarily in agricultural fields, restored grasslands, and forested areas within the known range of this species.

Following construction, the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Since no potential habitat for Prairie Bush Clover is located within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a leak or spill would not be expected to impact suitable habitats for Prairie Bush Clover.

Based on the avoidance and minimization measures, literature reviews, field investigations, EcoCAT results, and habitat types present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Prairie Bush Clover.

3.5.2.10. Rattlesnake-Master Borer Moth

The Kaskaskia River would be crossed using a HDD construction method. The remainder of the proposed pipeline alignment within the flowage easement north of Carlyle Lake would be trenched. The Rattlesnake-Master Borer Moth utilizes the rattlesnake master plant species for breeding purposes and is known or likely to occur within Fayette County. Based on the results of the habitat assessment field surveys, the Proposed Action Areas/Interrelated Activity Areas does not cross habitat containing the rattlesnake master plant species, or undisturbed mesic or wet-mesic prairies that would likely support this species. Dominant vegetation communities within Proposed Action Areas/Interrelated Activity Areas in Fayette County are agricultural, bottomland forest, or emergent wetland communities that are subjected to intense seasonal flooding for recreational hunting purposes.

Following construction, the pipeline ROW would be restored to pre-construction contours and elevations and allowed to return to original land-uses within Proposed Action Areas/Interrelated Activity Areas. Maintenance of the ROW would be limited to preventing the regrowth of trees within a 50-foot-wide permanent DAPL easement, limited to 30-feet in forested wetland areas. Dakota Access has also engineered and designed the pipeline to meet or exceed the requirements of 49 CFR 195, as administered by PHMSA. In the unlikely event of a leak or spill, Dakota Access would follow the procedures outlined in their FRP. Since no potential habitat for the Rattlesnake-Master Borer Moth is located within the Proposed Action Areas/Interrelated Activity Areas, the unlikely event of a leak or spill would not be expected to impact suitable habitats for the Rattlesnake-Master Borer Moth.

Based on literature reviews, field investigations, and lack of appropriate habitat type present in the Proposed Action Areas/Interrelated Activity Areas, USACE has determined that the Proposed Action would have *"no effect"* on the Rattlesnake-Master Borer Moth.

3.5.2.11. Endangered Species Act Coordination

A separate Biological Assessment document, dated March 2016, was coordinated with the USFWS in order to expedite compliance with the ESA. In a letter from the U.S. Fish and Wildlife Service dated 2 May 2016, the Service concurred with the determination that the project "*may affect, but is not likely to adversely affect*" the Indiana Bat. The Service considers section 7(a)(2) consultation to be completed for this species. Furthermore, the Service found that the Northern Long-Eared Bat is likely to be adversely affected by the DAPL Project, but that this project will not result in prohibited incidental take, and its effects are covered by the Programmatic Biological Opinion dated 5 January 2016. Thus, no additional consultation is needed for the Northern Long-Eared Bat unless: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in the consultation; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (3) a new species is listed or critical habitat is designated that may be affected by this project. The response letter from the USFWS can be found in Appendix K.

3.6. Fish and Wildlife Coordination Act

The amendments enacted in 1946 to the Fish and Wildlife Coordination Act require consultation with the USFWS for the purpose of preventing loss of and damage to wildlife resources. The USACE issued a public notice of the Section 408 review of the Proposed Action on 5 January 2016. The public notice provides the USFWS with the opportunity to provide recommendations under the Fish and Wildlife Coordination Act concerning the Proposed Action. No recommendations were received from the USFWS by the expiration date of the public notice (5 February 2016), thus, full compliance with the Fish and Wildlife

Coordination Act is inferred. Furthermore, Dakota Access has consulted with the USFWS for technical assistance to determine appropriate measures necessary to minimize and avoid impacts to wildlife resources.

3.7. Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. 668-668c), of 1940 as amended, prohibits anyone, without a permit issued by the Secretary of the Interior, from the "take" of bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb."

The U.S. Fish and Wildlife Service developed the National Bald Eagle Management Guidelines (USFWS 2007) to provide landowners, land managers, and others with information and recommendations regarding how to minimize potential impacts to bald eagles, particularly where such impacts may constitute disturbance. For purposes of the National Bald Eagle Management Guidelines, "disturb" means: "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available,

1. injury to an eagle,
2. a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or
3. nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior."

This definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding or sheltering habits, and causes injury, death or nest abandonment.

Although initial field investigations did not identify bald eagles or their nests within the Proposed Action Areas/Connected Action Areas, the USFWS will be contacted immediately if nests are encountered at any time, per the National Bald Eagle Management Guidelines. The National Bald Eagle Management Guidelines will be followed throughout the construction, operation and maintenance of the Proposed Action.

3.8. Land Use and Recreation

Under the “No Action” Alternative, Dakota Access would not construct the DAPL Project, and no impacts on land use and recreation would occur. However, if the objectives of the DAPL 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 DAPL 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.

3.8.1. Land Ownership

The Proposed Action would cross three USACE projects in Pike, Morgan and Scott counties, Illinois. These USACE projects include the McGee Creek levee of the Illinois River, owned and managed by the McGee Levee and Drainage District; the Illinois River; and the Coon Run levees of the Illinois River, situated on private property but managed by the Coon River Drainage District.

Additionally, the proposed 30-inch pipeline would cross fourteen contiguous USACE flowage easements over seventeen privately-owned parcels to the north of Carlyle Lake. Based upon recorded easement documents and mapping, the distance across the flowage easements near the Kaskaskia River in Fayette County is approximately 12,778 feet (2.42 miles). The flowage easements allow the Government to flood and saturate the land, surface, and subsurface of these properties.

3.8.2. Land Use

3.8.2.1. Affected Environment

Land use within the Proposed Action Areas/Connected Action Areas 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) was used to identify and classify general land use for the Proposed Action Areas.

Agricultural Land

Agriculture is the primary land use within the Proposed Action Areas/Connected Action Areas. These lands are primarily used for cultivating crops. Agricultural lands allows for land uses such as farming, ranching, animal feeding operations, grain storage, and related functions. Agricultural land within the Proposed Action Areas include both pivot irrigated and non-irrigated cropland of corn (*Zea mays*) and soybean (*Glycine max*).

Developed Land

Developed land includes open space around structures such as homes, farmsteads, outbuildings, well sites, and areas associated with roads and ditches. Little developed land would be affected by the Proposed Action.

Open Space

Open space includes all land that is not agriculture or developed; namely wetlands, open water, grasslands, scrub-shrub, and forested lands. Open space is found primarily along the river banks and adjacent floodplains. The largest section of open space affected by the Proposed Action occurs within the USACE flowage easements. See Sections 3.2 and 3.3 for a discussion on water resources and vegetation.

3.8.2.2. Impacts and Mitigation

The Proposed Action 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 implemented in accordance with the SWPPP. Upon the completion of construction activities, the Proposed Action Areas/Connected Action Areas would be restored and returned to pre-construction land use.

As mentioned above, a pivot irrigation system is present within the pipeline pull-string section associated with the HDD of the Illinois River and McGee Creek levee. This workspace is considered a Connected Action. Other agricultural lands crossed by the Proposed Action are non-irrigated fields. Dakota Access would coordinate with all landowners on acceptable methods for construction and restoration, including potential impacts to irrigated and non-irrigated fields. Compensatory damages would be paid accordingly.

The nearest residence to the Proposed Action on the flowage easements is approximately 360 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 farms would be the loss of standing crops and use of the land within the work area for the seasons during which the proposed 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 “Agricultural Impact Mitigation Agreement ("AIMA") between Dakota Access, LLC ("Dakota Access") and the Illinois (Appendix H). 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.

Once in operation, a permanent 50-foot ROW would be maintained except at segments of the ROW above the HDD profile and farmed tracts that would be maintained by clearing woody vegetation over a 30 foot corridor (a 50 foot DAPL easement would still be obtained). Maintenance would include the removal of any large trees and shrubs. Trees outside of the ROW would be protected by Dakota Access in a manner compatible with the safe operation, maintenance, and inspection of the pipeline. 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 permits.

3.8.3. Recreation and Special Interest Areas

3.8.3.1. 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 Areas/Connected Action Areas include the Illinois River, the Kaskaskia River, Carlyle Lake, National Wildlife Refuges, and State Fish and Wildlife Areas, none of which are being impacted by the construction, although the HDD would cross under the Illinois and Kaskaskia Rivers.

The Illinois River and Kaskaskia River are open to the public and used for recreational activities such as boating, swimming, and fishing. Because the Carlyle Lake flowage easements around the Kaskaskia River are federally regulated and privately owned, there is very limited recreational opportunities for the public within the flowage easements. Privately operated waterfowl hunting recreational opportunities exist within the Carlyle Lake flowage easements.

Meredosia National Wildlife Refuge

The Meredosia National Wildlife Refuge is a 5,255-acre national wildlife refuge, located along the east side of the Illinois River in Cass and Morgan counties, about 50 miles west of Springfield, IL. It is positioned in the upper end of the Alton navigation pool in an area that was historically known for its ability to sustain fish and wildlife. Land management programs are designed and administered to promote migratory bird, fish, and resident wildlife habitat in the Illinois River basin, while providing increased public recreation and educational opportunities. When complete, the refuge will include a combination of high quality backwater lake, bottomland forest, prairie, seasonal wetland, and permanent marsh habitat. As a functioning floodplain wetland complex, the refuge will pay a vital role in perpetuating biological diversity in the Illinois River basin. The proposed pipeline at the Illinois River crossing is about 1.7 miles south of the Meredosia National Wildlife Refuge.

Carlyle Lake State Fish and Wildlife Area

The Carlyle Lake State Fish and Wildlife Area is located approximately 60 miles east of St. Louis, MO, near Vandalia, IL. The area is at the northern end of Carlyle Lake and at the southwestern tip of Fayette County. Carlyle Lake is a 26,000-acre multipurpose lake administered by the U.S. Army Corps of Engineers. The Illinois Department of Natural Resources has a 25-year lease on part of the USACE property to conduct a variety of habitat management measures aimed at increasing food, shelter and nesting areas for numerous wildlife species.

Recreational opportunities abound on the lake and at Eldon Hazlet State Park, at the southern end of the lake. At the Fish and Wildlife Area, activities revolve mainly around enjoying the beauty and solitude of nature as visitors birdwatch, fish, and hunt. The federal lease land and state property provide almost 9,500 acres of wildlife habitat. The Fish and Wildlife Area is has great habitat diversity: approximately 2,000 acres of woodland, 5,800 acres of open water and wetlands, 200 acres of grassland and 1,500 acres of cropland planted for wildlife food and cover.

The proposed pipeline at the Kaskaskia River crossing and flowage easement area is about 6 miles northeast of the Carlyle Lake State Fish and Wildlife Area.

Illinois Natural Areas Inventory Sites

The Illinois Natural Heritage Database shows the following protected resources may be in the vicinity of the Proposed Action location: George Smith Bed INAI Site and Woods Lake Bed INAI Site in Pike County, and the Meredosia Docks Bed INAI Site and the National Starch Bed INAI Site in Morgan County.

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” (Total Maximum Daily Load) 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 those for which a TMDL is needed.

Carlyle Lake is on the 2016 Section 303(d) list of impaired waters as not supporting fish consumption because of high levels of mercury, and for aesthetic quality due to high total phosphorus and high total suspended solids (USEPA 2016).

The Illinois River is on the 2016 Section 303(d) list of impaired waters for primary contact for recreation due to fecal coliform and for not supporting fish consumption due to mercury and polychlorinated biphenyls at the HDD crossing location.

The Kaskaskia River is on the 2016 Section 303(d) list of impaired waters for public and food processing water supplies because of atrazine levels; primary contact for recreation due to fecal coliform; and for not supporting fish consumption due to mercury levels at the HDD crossing location.

3.8.3.2. Impacts and Mitigation

The recreational enjoyment of wildlife (such as hunting, fishing or bird watching) may be temporarily affected by construction activities, depending on season and location. However, this effect would be short-term and limited to construction only. Recreationists may observe ROW clearing along the river banks of the Illinois and Kaskaskia Rivers. Because the pipeline would cross underneath the each of these rivers via the HDD method, there would be no disruption to the course or cross-current of the river, and would not impact recreationists.

No impacts to areas of special interests such as the Meredosia National Wildlife Refuge, Carlyle Lake State Fish and Wildlife Area, or Illinois Natural Areas Inventory Sites would occur as a result of the construction of the Proposed Action. Construction activities will occur over a short period of time and would not occur within visible or audible proximity to any of these areas.

During operation of the pipeline, no effects to recreational opportunities or special interest areas are anticipated.

3.9. 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 DAPL Project and no impacts on cultural and historic resources would occur. However, If the objectives of the DAPL 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 DAPL 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.

3.9.1. Cultural Resources Studies

The scope of the cultural resource analysis was designed to be commensurate with the Proposed Action. The Proposed Action is to authorize the crossing of USACE project land near the Illinois and Kaskaskia Rivers in Pike and Morgan counties, IL, and federal flowage easements north of the upper end of Carlyle Lake in Fayette County, IL.

The cultural resources assessment was conducted in compliance with provisions of the following:

- Section 106 of the National Historic Preservation Act of 1966 (Title 54 U.S. Code), as amended;
- Protection of Historic and Cultural Properties (36 CFR 800);
- National Environmental Policy Act of 1969 (Public Law 91-190. 83 Stat. 852);
- Illinois State Agency Historic Resources Preservation Act of 1990 (20 Illinois Compiled Statutes [ILCS] 3420);
- Illinois Archaeological and Paleontological Resources Protection Act (20 ILCS 3435);
- Illinois Human Skeletal Remains Protection Act (20 ILCS 3440); and
- Illinois State Historic Preservation Office Guidelines for Archaeological Surveys/Reports.

3.9.1.1. Affected Environment

A check of previously-recorded cultural resources was undertaken within a 1.6-kilometer (km) (1.0-mile) radius of the Proposed Action Areas/Connected Action Areas prior to the commencement of fieldwork. Online databases were consulted, including the National Historic Landmark list and the National Register of Historic Places. The Historic and Architectural Resources Geographic Information System (HARGIS), maintained by the Illinois Historic Preservation Agency (IHPA), was consulted for locational and other information regarding historic buildings, historic engineering structures, and cemeteries. The Illinois Inventory of Archaeological Sites geodatabase, maintained by the Illinois State Museum, was consulted for locational and other data regarding recorded archaeological sites and previously-reported archaeological surveys and excavations. The Illinois Cultural Resource Management Report Database, maintained by the University of Illinois, was consulted for detailed information available in previous reports. General Land Office maps were researched at the Federal Township Plats website maintained by the Illinois Secretary of State. Old county plat maps and atlases were researched at the Illinois State Library and the Galesburg Public Library.

The research goals include the identification of historic properties significant at the national, state, regional, or local level within the Proposed Action Areas/Connected Action Areas and collecting sufficient site-specific data to utilize in project planning. Each archaeological resource documented within the Proposed Action corridor during the course of the Phase I survey was evaluated using the NRHP criteria for evaluation (36 CFR 60.4).

Field methods employed during the Phase I archaeological survey consisted of a combination of systematic shovel testing and pedestrian survey with visual inspection within the 400-foot-wide Proposed Action survey corridor.

Where ground surface visibility was less than 25%, shovel tests were positioned at 15-meter (m) (98-foot) grid or transect intervals. Racketing shovel tests were excavated at intervals of 5 m (16 feet) outward from positive shovel tests along the periphery of each identified site to determine the site boundaries within the Proposed Action corridor. All shovel tests were excavated to a depth of at least 10 centimeters (cm) (3.9 inches) into the sterile subsoil. Backdirt was screened through 0.625-cm (0.25-inch) hardware cloth, with all recovered artifacts bagged and recorded by shovel test number. All artifacts recovered from shovel tests were bagged in accordance with provenience. A profile of every positive shovel test was recorded, and artifact contents were recorded for all positive shovel tests. The locations of all shovel tests were recorded using the ArcGIS Collector Application with an iPad and portable GPS unit.

Areas in which the ground surface visibility exceeded 25% or slope exceeded 15% were subjected to pedestrian survey with visual inspection. The ground surface was inspected at 5 m transect intervals. Where cultural material was encountered, the survey interval was reduced to 2.5 m (8.2 feet) to improve artifact recovery and help determine site boundaries. Artifacts recovered during pedestrian survey were bagged according to provenience. Surface find locations and/or concentrations and site boundaries were mapped using the ArcGIS Collector Application with an iPad and portable GPS unit.

In addition to standard archaeological survey, deep testing operations were undertaken to assess the potential for deeply-buried archaeological deposits in the subject areas. This work was directed by a geomorphologist and was involved the excavation of piston cores, hand auger cores, and backhoe trenches along the proposed DAPL centerline. Stratigraphy exposed in these exploratory excavations was then interpreted to develop an understanding of the potential for former (prehistoric) living surfaces in light of documented depositional sequences.

The literature review determined that 46 archaeological sites are mapped within a one mile radius of the Proposed Action Areas/Connected Action Areas. These sites consist of 41 historic or prehistoric artifact scatters and five prehistoric burial mound sites. Prior to the DAPL survey, none of these sites had been assessed to determine NRHP eligibility. Of these 46 sites, only one (11ST176) is mapped within the Proposed Action Areas/Connected Action Areas, and it is recommended as not eligible for NRHP listing.

3.9.1.2. Impacts and Mitigation

Phase I archaeological survey and deep testing within the Proposed Action and Connected Action Areas in Illinois was undertaken between December of 2014 and August of 2015. Six prehistoric sites, 11FY591, 11ST176, 11ST582, 11ST599, IIFY42 , and 11ST192 are within the Proposed Action and Connected Action Areas. Sites 11FY591 11ST176, and 11ST582 would be crossed by an HDD and the pipeline would pass deeply below each site, no archaeological deposits would be impacted. Site 11ST599 is not eligible but is adjacent to the pull string area of the Coon Run levees HDD. Site 11FY42 was recommended as not eligible and IHPA concurred in a letter dated 3 March 2016. Site 11ST192 would only be crossed by a construction-matted travel lane that would be used to access the east side of the Coon Run levees HDD workspace area. Deep testing found no evidence for deeply buried sites or buried landforms suitable for the preservation of prehistoric cultural horizons. No further work is recommended for the USACE projects or flowage easements traversed by the Proposed Action in Illinois. IHPA concurred with these findings by stamped concurrence dated April 4, 2016. Coordination letters can be found in Appendix K.

In accordance with Section 106 of the NHPA, Dakota Access has made a good faith effort to identify significant historic properties within the Proposed Action Areas/Connected Action Areas. 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 Action or Connected Actions.

Dakota Access' Unanticipated Discovery Plan (UDP) was developed (Appendix I) for use during all DAPL Project construction activities regardless of jurisdiction or landownership. The UDP describes actions that would take place in the event that an undocumented 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.

3.9.2. Native American Consultations

The DAPL pipeline crosses over three Districts (Omaha, Rock Island, and St. Louis). This EA discusses the tribal consultation for the Proposed Action Areas/Connected Action Areas located within the St. Louis District boundaries. The USACE initiated formal consultation with all tribes (over 70) for the DAPL pipeline on 3 September 2015. On 22 January 2016, the St. Louis District sent a second letter to the 28 tribes the St. Louis District consults with, with information on all permit areas including the Proposed Action Areas/Connected Action Areas, asking the tribes to let the USACE St. Louis District if they would like to enter into consultation on any of the areas. A third letter was sent to all tribes on 2 March 2016, asking all tribes to let the USACE St. Louis District know which areas or sites they wanted to monitor.

The Osage Nation, by letter dated February 3, 2016, notified the St. Louis District of their concerns regarding the proposed DAPL crossings at the Illinois River navigable channel at Milepost 901, Coon Run Levee, McGee Creek Levee, and the Carlyle Lake flowage easements in Pike, Morgan, Scott, and Fayette counties, Illinois.

The Osage Nation raised questions on one of the three sites located in the Coon River levees Proposed Action Areas/Connected Action Areas. Three sites were identified: one site was recommended not eligible and the IHPA concurred in a letter dated 3 March 2016; the second site that was recommended not eligible is being avoided. The Osage Nation wanted the third site avoided, but after an explanation on how the HDD is done and that the site would not be disturbed, The Osage Nation stated verbally they would not enter into consultation on this site but would like to monitor the area during the placement of the pipe.

The Osage Nation had concerns for one of the sites at the Proposed Action Areas/Connected Action Areas located at the Carlyle Lake flowage easement. Two sites were identified in the vicinity of the Proposed Action Areas/Connected Action Areas, however one is outside of the Proposed Action/Connected Action footprint. Both sites were recommended as not eligible and the IHPA concurred in a letter dated 3 March 2016. The one site located outside the footprint will be avoided and The Osage Tribe stated verbally they would not enter into consultation on the Proposed Action Areas/Connected Action Areas at Carlyle Lake.

No other tribe has indicated they would like to consult on the Proposed Action Areas/Connected Action Areas that cross the St. Louis District. Tribal consultation is complete for the Section 408 Proposed Action Areas. The Osage Nation will be informed when the HDD is occurring at the single site they want to monitor, and arrangements will be made for them to send a representative. Coordination letters can be found in Appendix K.

3.10. Social and Economic Conditions and Environmental Justice

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project and no impacts on social and economic conditions or environmental justice would occur. However, If the objectives of the DAPL Project are to be met under the "No Action" Alternative, other projects and activities would be required (e.g. transportation of oil by truck or rail) and these projects would result in their own social and economic conditions impacts and environmental justice impacts, which would likely be similar to or greater than the DAPL 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 and environmental justice would occur as a result of the Proposed Action, as described in the sections below.

The overall DAPL Project is a $3.78 billion dollar investment directly impacting the local, regional, and national labor force by creating nearly 12,000 construction jobs. Dakota Access has publically committed to utilizing American labor to build the pipeline. Dakota Access has teamed up with the various craft and labor unions in the DAPL Project regions and nationally to ensure the DAPL Project is constructed by highly qualified and experienced local and regional labor resources. These construction jobs would create considerable labor income and state income tax revenue – including the generation of more than $16.4 million in state sales tax and an estimated $3.0 million in local sales tax during construction. The estimated property tax to be paid in Illinois the first year of operation is $750,000. If authorized, the DAPL Project would put welders, mechanics, electricians, pipefitters, heavy equipment operators, and others within the heavy construction industry to work.

3.10.1. Demographics, Population and Employment

3.10.1.1. Affected Environment

Population and employment data were collected using census tracts which are crossed by the Proposed Action. The Illinois River crossing is in a rural agricultural area in Morgan, Pike, and Scott counties, and no towns or cities are close to the pipeline route. However, the town of Meredosia is 1.4 mile northeast of the pipeline crossing and contains public elementary, junior, and high schools. The town of Bluffs is 1.2 miles south of the pipeline crossing of State Route 100 and contains a high school. The Kaskaskia River crossing is in a rural agricultural area in Fayette County southwest of Vandalia and is not near any population centers, schools, or other areas with concentrations of children.

The unemployment rate in the counties ranges from 6.2 to 11.1 percent, compared to 10.0 percent unemployment in the state as a whole. In the census tracts for the Proposed Action, the unemployment rate ranges from 4.3 to 12.9 percent. Census tracts 9510 and 9706 both have unemployment rates that are very slightly (1.8 percentage points) higher than those of their respective counties.

3.10.1.2. Impacts and Mitigation

The Proposed Action 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 Proposed Action Areas/Connected Action Areas could experience short-term temporary effects to the local economy through induced spending from construction employees working on the crossings. No residential homes or farms would be relocated as a result of the Proposed Action. In compliance with Executive Order 13045, Protection of Children from Environmental Health and Safety Risks, the pipeline crossings would not be

near any facilities where children are present and would not constitute an environmental health and safety risk that may disproportionately affect children.

The total population, households, and unemployment rate of the four counties and census tracts are provided in Table 7.

Table 7
Population and Employment

Geographic Area	Total Population	Households	Unemployment Rate (2010)
STATE			
Illinois	12,868,747	4,778,633	10.0
COUNTY			
Fayette County	22,041	7,981	11.1
Morgan County	35,272	13,961	8.8
Pike County	16,244	6,675	6.2
Scott County	5,260	2,074	8.9
CENSUS TRACT			
9510 (Fayette Co.)	2,240	865	12.9
9514 (Morgan Co.)	2,675	1,142	8.5
9524 (Pike Co.)	2,913	1,273	4.3
9706 (Scott Co.)	1,935	705	10.7

Source: U.S. Census Bureau, American Community Survey (2010-2014 5-year estimates).

3.10.2. Environmental Justice

Executive Order 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 effects 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 percent, 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).

3.10.2.1. Affected Environment

For this Proposed Action, minority and low-income populations were identified by determining the percentage of minority and low-income residents for the census tracts crossed by the Proposed Action. Morgan, Pike, and Scott Counties and the State of Illinois were selected as comparison areas. Low-income populations were identified based on poverty rates for the populations of these census tracts. For this analysis, an increase of at least 10 percentage points indicates a minority or low-income population that is "meaningfully greater" than the general population in the comparison areas.

All four counties and all four census tracts have smaller percentages of minority populations compared to the state as a whole (Table 8). Census tract 9510 in Fayette County and census tract 9514 in Morgan

County have smaller percent minority populations overall and in each minority population category, relative to their respective counties. Census tract 9524 has a smaller percent minority population overall relative to Pike County, and only a slightly higher (less than 1 percent) percent of individuals reporting as two or more races or reporting as Hispanic or Latino (of any race). Census tract 9706 has only a slightly higher (1.5 percent) percent minority population overall relative to Scott County, and a slightly higher (2.5 percent) percent of individuals reporting Hispanic or Latino (of any race).

Table 8
Minority Population Statistics

Geographic Area	Total Population	Percent[1]							
		White Alone (not Hispanic or Latino)	Black or African Am.	Am. Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Some Other Race	Two or More Races	Hispanic or Latino (of any race)
STATE									
Illinois	12,868,747	62.9	14.4	0.2	4.9	0.0	5.8	2.2	16.3
COUNTY									
Fayette County	22,041	94.6	3.0	0.1	0.2	0.0	0.2	0.8	1.6
Morgan County	35,272	89.5	6.2	0.1	0.3	0.0	0.1	1.9	2.2
Pike County	16,244	95.9	1.1	0.6	0.4	0.0	0.2	1.0	1.2
Scott County	5,260	97.5	0.0	0.1	0.2	0.0	0.0	0.8	1.5
CENSUS TRACT									
9510 (Fayette Co.)	2,240	98.6	0.2	0.0	0.0	0.0	0.0	0.4	1.1
9514 (Morgan Co.)	2,675	98.5	0.1	0.1	0.0	0.0	0.1	1.1	0.3
9524 (Pike Co.)	2,913	96.2	0.7	0.2	0.0	0.0	0.2	1.6	1.7
9706 (Scott Co.)	1,935	96.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0

Source: U.S. Census Bureau, American Community Survey (2010-2014 5-year estimates).
[1] Totals do not add to 100 percent because Hispanic or Latino is an ethnicity, not race; therefore, it is possible for an individual to be both Hispanic or Latino and be a member of a minority race.

The poverty rate in both Morgan and Scott Counties is less than or equal to the poverty rate in the State as a whole. In Fayette County and Pike County, the poverty rate is slightly higher (2 percentage points or less) than it is in the State as a whole. In all four of the census tracts, the poverty rate is lower than it is in both the respective counties and in the State as a whole (Table 9).

Table 9 Low-Income Population Statistics		
Geographic Area	**Median Household Income ($)**	**Persons Below the Poverty Level (%)**
STATE		
Illinois	57,166	14.4
COUNTY		
Fayette County	44,603	16.4
Morgan County	46,524	14.4
Pike County	38,740	15.3
Scott County	48,500	13.9
CENSUS TRACT		
9510 (Fayette Co.)	47,875	8.5
9514 (Morgan Co.)	43,578	9.8
9524 (Pike Co.)	38,373	13.4
9706 (Scott Co.)	52,535	11.5

Source: U.S. Census Bureau, American Community Survey (2010-2014 5-year estimates).

3.10.2.2. Impacts and Mitigation

For compliance with Executive Order 12898 on Environmental Justice, the pipeline corridor does not cross any communities with minority or low-income populations that are "meaningfully greater" than the minority or low-income populations in the general population. As discussed above, the areas crossed by the Proposed Action have minority populations that are less than, equal too, or slightly higher (1.5 to 2.5 percent higher) than the minority populations in the respective counties. Thus, the census tracts crossed by the Proposed Action do not include minority populations that are "meaningfully greater" than the minority populations in the general population.

The areas crossed by the Proposed Action have poverty rates less than, equal too, or slightly higher (2 percentage points) than poverty rates in the State as a whole. Thus, the census tracts crossed by the Proposed Action do not include low income populations that are "meaningfully greater" than the low income populations in the general population.

Thus, the Proposed Action would not disproportionately affect identified minority or low-income populations.

3.11. Hazardous, Toxic, and Radioactive Wastes

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 Proposed Action corridor was conducted by searching online records at the EPA NEPA Assist Tool (EPA, 2015). Presently, there are no recognized Radiation Information Database, Brownfields, or Superfund sites within one mile of the corridor in Fayette, Morgan, Pike, or Scott Counties. However, on the south side of Meredosia and about 3,000 feet from the closest pipeline route, Celanese Ltd., Ameren Meredosia Power Station, and the Meredosia Terminal are on the Toxic Release Inventory and registered under the Toxic Substances Control Act as handling regulated chemicals. These sites also generate air emissions and maintain NPDES discharge permits. No operating sensitive receptors, such as schools or hospitals, are reported within at least one mile of the Proposed Action Areas/Connected Action Areas.

Within the Proposed Action Areas/Connected Action Areas, there is potential for temporary impacts to public safety from hazardous material use. Other hazards to worker safety may also exist along the Proposed Action corridor, but do not pose a significant impact. Because there were no regulated brownfield or Superfund sites found within the one-mile search radius of the Proposed Action Areas/Connected Action Areas, no impacts to the Proposed Action, Proposed Action media, or worker safety are expected. In the unlikely event contamination is encountered during construction, the UDP (Appendix I) 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 the DAPL Project's SPCC plan and Unanticipated Discovery Plan as well as the 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.

3.12. Reliability and Safety

The PHMSA, a federal agency within the U.S. DOT is the primary 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 activities, residents and other pedestrians in the neighborhood. Given the low population density of the area, safety risks during construction would be limited to workers involved with the Proposed Action. 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.

Dakota Access has drafted a FRP, 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. The FRP is discussed under Section 3.2.1.2 and a draft of the FRP is included in Appendix G.

Following completion of construction and throughout operation of the Proposed Action 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.

Dakota Access will conduct emergency response drills/exercises in accordance with the National Preparedness for Response Exercise Program (PREP), which is recognized, and approved, by the EPA, US Coast Guard, and PHMSA. These emergency response exercises will consist of annual table top exercises and equipment deployment drills. Regulatory and stakeholder participation will be encouraged and solicited for the exercises.

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. State–of-the-art leak detection equipment and software utilized during operations or the pipeline will be updated per federal standards in accordance with PHMSA requirements. 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.

In the unlikely event of a leak during operations of the pipeline, the Operator would implement the response measures described in the FRP. Below is a list of typical response activities. However, each spill mitigation situation is unique and will be treated according to the actual spill circumstances present at the time of release.

Notification: The Operator will conduct notifications in accordance with federal and state guidelines. These guidelines, along with additional notification forms/procedures are presented in Appendix B of the FRP (Appendix G). Local government response agencies would be notified first followed by federal and state agencies as well as surrounding communities, and governments (including tribal governments and utilities) in accordance with the relevant provisions of the FRP and relevant law. Response notification to such entities as the National Response Center, PHMSA, EPA, USACE, and affected state regulatory entities will be made in accordance with the requirements dictated by the incident type. A complete list of required notifications is included in the FRP. In accordance with PHMSA policy, the FRP will be updated every five years or sooner if there are material changes to the Plan.

Mobilize Response Equipment: Emergency equipment would be available to allow personnel to respond safely and quickly to emergency situations. Company-owned equipment will be inspected and exercised in accordance with PREP guidelines and would be mobilized and deployed by the Operator from strategic staging locations along the pipeline. Additionally, the operator will contractually secure OSROs to provide trained personnel and equipment necessary to respond, to the maximum extent practicable, to a worst case discharge or substantial threat of such discharge. At a minimum, each OSRO will have a containment booms, absorbents, boats, and vacuum trucks available. A complete list of equipment and list of trained

personnel necessary to continue operations of the equipment and staff the oil spill removal organization for each of the OSRO contractors is included in the FRP.

Response Activities: Following incident command protocols, the Operator would work in unison to cooperate with and assist fire, police and other first responders when implementing actions to protect personnel, public safety and the environment. The FRP includes a spill response checklist which lists activities that could be conducted during a spill which would be modified to best address the specific circumstances of a spill event. Incident response activities may include: initiating spill assessment procedures including surveillance operations, trajectory calculations, and spill volume estimating; berming or deployment of containment and/or sorbent booms; lining shorelines with sorbent or diversion booms to reduce impacts; and recovering contained product as soon as possible to prevent the spread of contamination using appropriate hoses, skimmers, pumps, and storage containers or vacuum trucks at collection areas. The response activities would continue until an appropriate level of cleanup is obtained as provided by the responsible federal, state, or other governmental authorities. The nature and location of the incident will affect the regulatory and notification requirements, for which more detail is provided in the FRP. Incidents involving discharges to navigable waters are governed the Oil Pollution Act of 1990.

3.13. Air Quality and Noise

Under the "No Action" Alternative, Dakota Access would not construct the DAPL Project and no impacts on air quality and noise would occur. However, If the objectives of the DAPL 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 DAPL 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.

3.13.1. Air Quality

3.13.1.1. 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 National Ambient Air Quality Standards (NAAQS) for six criteria pollutants (carbon monoxide, ozone, lead, nitrogen dioxide, sulfur dioxide, particulate matter with diameter less than 10 (PM_{10}) and fine particulate matter ($PM_{2.5}$), permit requirements for both stationary and mobile sources, and standards for acid deposition and stratospheric ozone (O_3) 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's Green Book Nonattainment Area website, Pike County, Morgan County, Scott County, and Fayette County are attainment areas as of October 1, 2015 for criteria pollutants. There are no criteria pollutant monitoring stations in the above listed counties. According to the Illinois Ambient Air Monitoring 2016 Network Plan (Illinois Environmental Protection Agency Bureau of Air [IEPABA], September 2015), the surrounding monitoring stations are located in Quincy, Adams County; Springfield, Sangamon County; Nilwood, Macoupin County; Jerseyville, Jersey County; Effingham, Effingham County and Maryville, Madison County.

The Illinois Ambient Air Monitoring 2015 and 2016 Network Plan shows Quincy, Effingham and Maryville monitoring stations monitoring only ozone (IEPABA, September 2015; IEPABA, August 2014). The Nilwood monitoring station monitors both sulfur dioxide and ozone. The Jerseyville monitoring station monitors $PM_{2.5}$ and ozone. There are two monitoring stations in Springfield in the 2016 Network Plan; one station monitors particulate matter ($PM_{2.5}$) and the other station monitors ozone. In the 2015 Network Plan, a third Springfield station is present and it monitors SO_2. The primary objective of the monitors located in Quincy, Effingham, Maryville and Springfield is to measure population exposure to air quality parameters. The Nilwood and Jerseyville monitoring stations primary objective is transport between populated areas.

The EPA Design Value website provides the detailed criteria pollutant 2014 Design Value Reports. The Design Value Reports contain design values which are location air quality statistics designed to be consistent with the NAAQS. The monitoring site design value history from 2003 to 2015 provided in the Design Value Reports can be compared against the NAAQS values to determine if an EPA Air Quality Standard has been exceeded. It is important to note that the information in these reports can change after publication. At the time of the report, the monitoring data for the stations listed above show pollutant levels for ozone (8-hour) and particulate matter ($PM_{2.5}$) did exceed the EPA Air Quality Standards. The pollutant levels for sulfur dioxide (1-hour) did not exceed the EPA Air Quality Standards.

3.13.1.2. Impacts and Mitigation

Within the Proposed Action Areas/Connected Action Areas, no long-term impacts to air quality would occur; the proposed pipeline would not emit any criteria air pollutants and is entirely underground. Short-term impacts to air quality may occur during construction phase of the Proposed Action. The contribution of the Proposed Action 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 HDD across the McGee Creek levee, the Illinois River, and the Coon Run levees is likely to take eight to twelve weeks to complete. Conventional pipeline construction across the federal flowage easements would take approximately one month to complete. 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.

3.13.2. Noise

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 10). 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 10 Noise Values		
Area	**Noise Level**	**Effect**
All areas	L_{eq} (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	L_{dn} < 55 dBA	Outdoor activity interference and annoyance
Outdoor areas where people spend limited time such as school yards, playgrounds, etc.	L_{eq} (24) < 55 dBA	Outdoor activity interference and annoyance
Indoor residential areas	L_{dn} < 45 dBA	Indoor activity interference and annoyance
Indoor areas with human activities such as schools, etc.	L_{eq} (24) < 45 dBA	Indoor activity interference and annoyance

Source: The Engineering ToolBox, 2015; L_{eq}: 24-hr equivalent sound level; L_{dn}: day-night average sound level

3.13.2.1. Affected Environment

The dominant land use in the Proposed Action Areas/Connected Action Areas is agricultural in Pike, Morgan, and Scott counties, and primarily forested in Fayette County. The Day-Night Average Sound (Ldn) level for agricultural crop land is 44 dBA, and rural residential is 39 dBA (The Engineering ToolBox, 2015).

3.13.2.2. Impacts and Mitigation

Construction of the Proposed Action would temporarily affect the noise levels on and around the Proposed Action Areas/Connected Action 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. Dakota Access would mitigate noise impacts by limiting equipment running times and the duration of Proposed Action construction to the minimum amount necessary to complete the Proposed Action. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime only).

Based on the setting of the Proposed Action Areas/Connected Action Areas, it is not anticipated that the temporary increase in ambient sound levels associated with construction would result in a significant noise impact.

3.14. Climate Change

Climate change is a fundamental environmental issue, and is a particularly complex challenge given its global nature and inherent interrelationships among its sources, causation, mechanisms of action, and impacts. Climate change science is evolving, and is only briefly summarized here. In 1970, the level of

atmospheric carbon dioxide was estimated at 325 parts per million (ppm) (CEQ, 1970). Since 1970, the concentration of atmospheric carbon dioxide has increased at a rate of about 1.6 ppm per year (1970-2012) to approximately 396 ppm in December 2014 (current globally averaged value). Based on the United States Global Change Research Program as well as other scientific records, it is now well established that rising global atmospheric greenhouse gas emission concentrations are significantly affecting the Earth's climate (USACE, 2015).

3.14.1. Affected Environment

Illinois has a climate characterized by marked seasonal and latitudinal variation in temperature and precipitation. Summers are warm and humid, spring and autumn are mild, and winters are cold with snowfall accumulations. Average annual temperatures vary across latitude, from 48° F in the north to 58° F in the south. Average annual precipitation ranges from 32 inches in the north to over 48 inches in the south. Average annual snowfall ranges from 36 inches in the north to less than 10 inches in the south. The average freeze-free season ranges from 160 days in the north to more than 190 days in the south. Severe weather systems are a major factor impacting the Illinois climate, with thunderstorms providing 50 to 60 percent of annual precipitation. The polar jet stream is often located over Illinois, delivering cold weather and heavy snowfall in winter (Chagnon et al., 2004).

3.14.2. Impacts and Mitigation

The approach at USACE is to consider the questions in need of climate change information at the geospatial scale where the driving climate models retain the climate change signal. At present, USACE judges that the regional, sub-continental climate signals projected by the driving climate models are coherent and useful at the scale of the 2-digit HUC (Water Resources Region) (Figure EA-1). Within Water Resources Region 07, the general consensus in the recent literature points toward moderate increases in temperature and precipitation, and streamflow over the past century. In some studies, and some locations, statistically significant trends have been quantified. In other studies and locales within the Upper Mississippi Region, apparent trends are merely observed graphically but not statistically quantified. There has also been some evidence presented of increased frequency in the occurrence of extreme storm events (Villarini et al., 2013). Lastly, a transition point in climate data trends, where rates of increase changed significantly, was identified by multiple authors at approximately 1970 (USACE, 2015).

There is strong consensus in the literature that air temperatures will increase in the study region, and throughout the country, over the next century. The studies reviewed here generally agree on an increase in mean annual air temperature of approximately 2 to 6 ºC (3.6 to 10.8 ºF) by the latter half of the 21st century in the Upper Mississippi Region. Reasonable consensus is also seen in the literature with respect to projected increases in extreme temperature events, including more frequent, longer, and more intense summer heat waves in the long term future compared to the recent past (USACE, 2015).

Projections of precipitation found in a majority of the studies forecast an increase in annual precipitation and in the frequency of large storm events. However, there is some evidence presented that the northern portion of the Upper Mississippi Region will experience a slight decrease in annual precipitation. Additionally, seasonal deviations from the general projection patter have been presented, with some studies indicating a potential for drier summers. Lastly, despite projected precipitation increases, droughts are also projected to increase in the basin as a result of increased temperature and ET rates (USACE, 2015).

Figure EA-1. Water Resources Region 07: Upper Mississippi Region Boundary.

A clear consensus is lacking in the hydrologic projection literature. Projections generated by coupling Global Climate Models (GCMs) with macro scale hydrologic models in some cases indicate a reduction in future streamflow but in other cases indicate a potential increase in streamflow. Of the limited number of studies reviewed here, more results point toward the latter than the former, particularly during the critical summer months (USACE, 2015).

The trends and literary consensus of observed and projected primary variables noted above have been summarized for reference and comparison in Figure EA-2 (USACE, 2015).

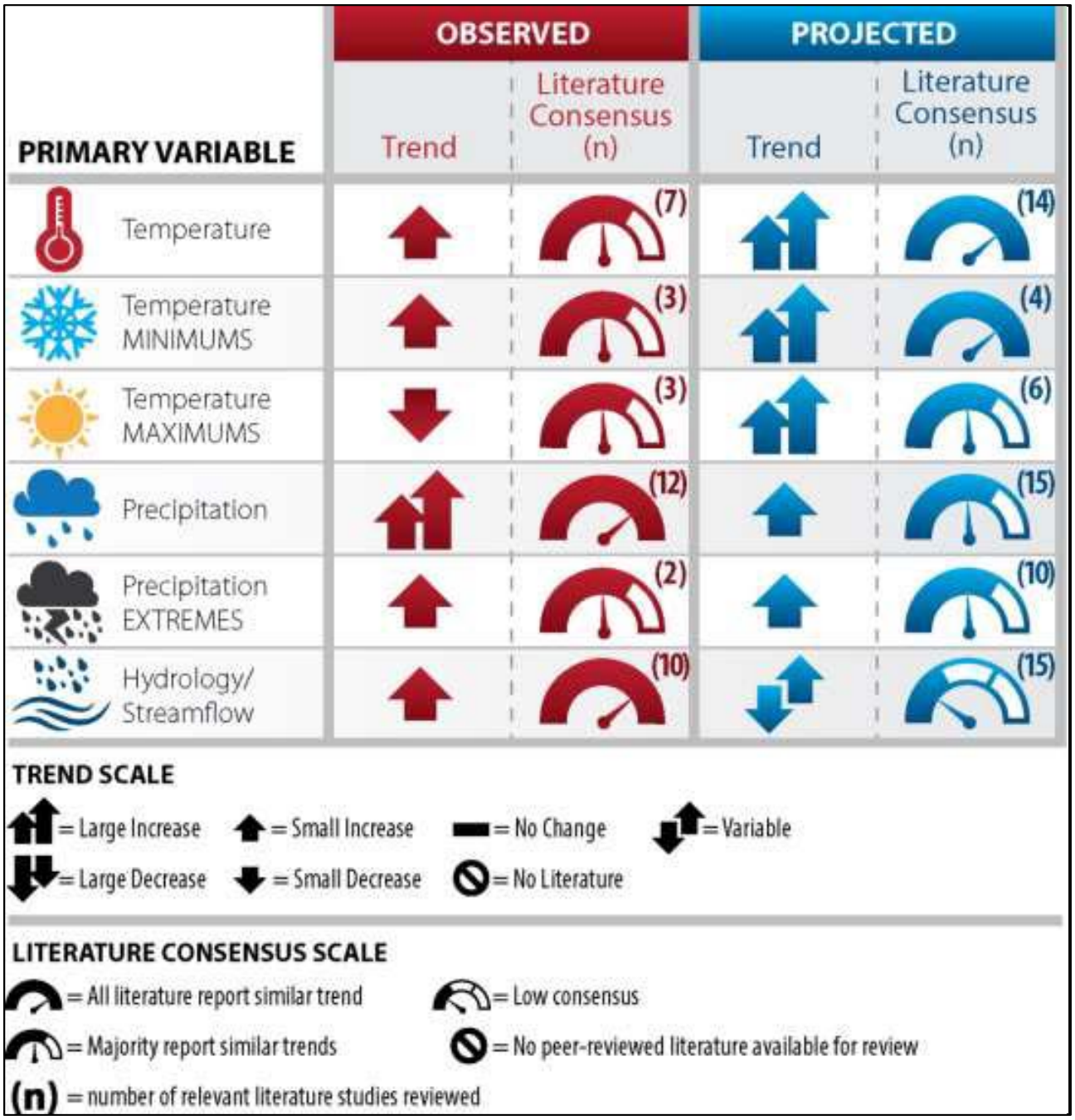

Figure EA-2. Summary matrix of observed and projected climate trends and literary consensus.

Temperature extremes, increased precipitation, and increased severe weather associated with climate change are likely to impact human well-being and economic growth across the Midwest. In Illinois, 20 to 30 deaths each year are attributed to severe weather including floods, winter storms, tornados, and lightning. Heat and cold waves in Illinois cause even more deaths than severe weather, with an average of 74 deaths per year attributed to heat and 18 deaths each year attributed to cold. Heavy precipitation in Illinois has increased since the 1940s, causing increases in peak river flood levels. Annual flood losses in Illinois have averaged $257 million annually since 1983, and have increased steadily since the 1950s. Much of the economy in central Illinois relies on agriculture, which is dependent upon climate and timely precipitation. Increased evapotranspiration rates and frequency of severe weather could damage crops. Conversely, a lengthened frost-free season and increased precipitation may increase crop yields.

The Proposed Action has no emission sources during operation of the DAPL Project in the Proposed Action Areas/Connected Action Areas and would therefore not emit Green House Gases (GHG). Short-term emissions of GHG will occur during construction phase of the Proposed Action, but the contribution of the Proposed Action to GHG 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 emit GHG. Construction of the HDDs across the McGee Creek levee, the Illinois River, and the Coon Run levees is likely to take eight to twelve weeks to complete. Conventional pipeline construction across the federal flowage easements would take approximately one month to complete. To reduce the emission of GHG, 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 local or regional climate long-term.

Carbon dioxide is sequestered from the air by growing vegetation and emitted by decomposing vegetation. In the Proposed Action Areas/Connected Action Areas, the primary land cover is cultivated cropland and deciduous forest. Vegetation within the 50-foot permanent ROW will be cleared and maintained to prevent re-growth of trees. The effect of tree clearing on GHG remains uncertain. Because growing vegetation sequesters carbon dioxide, clearing of vegetation may cause an increase of GHG. Conversely, where emissions due to vegetative decomposition exceed sequestration due to vegetative growth, tree harvest may be an important climate change mitigation strategy (Bellassen and Luyssaert, 2014). To minimize impacts on vegetation, additional temporary workspace would be restored to pre-impact conditions. Based on the avoidance measures being implemented, vegetation clearing for the Proposed Action is not expected to impact local or regional climate long-term.

Dakota Access does not extract or produce any product. Dakota Access would provide a pipeline that is a safe and efficient logistical link between supply and demand for oil and petroleum products. A pipeline is a more efficient way to ship the supply to the demand because they ship only the product itself, where trains, trucks, and ships also require energy to move the heavy container. Not only the transportation via tanks, trucks and ships generate GHG emissions, but the loading and unloading of the product could also emit GHG emissions depending on the product loaded/unloaded and controls in place. More broadly, shipping oil from North Dakota to domestic refineries also requires much less total shipping distance than importing the oil from the Middle East, Africa, or South America (or even Alaska). Given that pipelines are more efficient means of transporting crude oil, the Proposed Action is likely to have a net positive impact on carbon emissions.

4. 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. Cumulative impacts are studied to enable the public, decision-makers, and project proponents to consider the "big picture" effects of a project on the community and the environment. In a broad sense, all impacts on affected resources are probably cumulative; however, the role of the analyst is to narrow the focus of the cumulative effects analysis to important issues of national, regional, or local significance (CEQ, 1997).

The Council on Environmental Quality (CEQ) issued a manual entitled *Considering Cumulative Effects Under the National Environmental Policy Act* (1997). This manual presents an 11 step procedure for addressing cumulative impact analysis. The cumulative effects analysis for the Proposed Action followed these 11 steps, shown in Table 11. The following subsections address scoping, the affected environment, and environmental consequences for the Proposed Action.

Table 11
CEQ's 11-Step Approach for Assessing Cumulative Impacts

Component	Steps
Scoping	1. Identify resources
	2. Define the study area for each resource
	3. Define time frame for analysis
	4. Identify other actions affecting the resources
Describing the Affected Environment	5. Characterize resource in terms of its response to
	6. Characterize stresses in relation to thresholds
	7. Define baseline conditions
Determining the Environmental Consequences	8. Identify cause-and-effect relationships
	9. Determine magnitude and significance of
	10. Assess the need for mitigation of significant
	11. Monitor and adapt management accordingly

4.1. Scoping

Past actions in the Proposed Action Areas/Connected Action Areas predominantly include agriculture and flood risk reduction projects, such as the construction of flood risk reduction levees, acquisition of flowage easements, and seasonal flooding for recreational hunting use. Limited industrial activity adjacent to the Illinois River is present and is considered for its potential incremental impact to resources that could be affected by the Proposed Action at the Illinois River. Each of these past activities most likely have had impacts on soils, water resources, vegetation, wildlife, land use, visual resources, paleontological resources, and cultural resources. The DAPL Project route was sited to minimize green-space impacts by co-locating with existing utility corridors where practicable. However, within the Proposed Action Areas/Connected Action Areas addressed in the EA, co-location with existing rights-of-way was not an available option and therefore the route was selected to minimize impacts to the environment by minimizing the distance and crossing locations of sensitive resources.

The geographic limits for this analysis included portions of Pike, Morgan, and Scott Counties within the Illinois River floodplain. For the Proposed Action Areas/Connected Action Areas in Fayette County, the geographic analysis is bounded by the limits of the USACE flowage easements at Carlyle Lake. However, for determining cumulative impacts to resources that extend beyond these boundaries the distribution of resource affected was considered when assessing environmental consequences. The timeframe for analysis considers impacts from past actions and anticipated from construction through the operational life of the Proposed Action, or potential influence to the affected resources based on an indefinite term of operation.

Chapter 3 provides a description of the existing condition each resource considered. To identify reasonably foreseeable actions, or actions or projects with a reasonable expectation of actually happening, as opposed to potential developments expected only on the basis of speculation, USACE was able to review current and past actions that have sought authorization through the Regulatory Program. No reasonably foreseeable actions have been identified that would contribute to cumulative impacts to the resources within the Proposed Action Areas/Connected Action Areas.

4.2. Affected Environment

The following sections describe the results of the impact analysis for each of the resources considered in Section 3.0. Table 12 is a checklist identifying potential incremental cumulative impacts to resources affected by the Proposed Action. If a resource was not identified to have a cumulative impact then the resource was not discussed in detail in Section 4.3, Environmental Consequences. The cumulative impact analysis considers future conditions as follows:

- Without the Proposed Action – No USACE Action
- With the Proposed Action – Requester's Preferred Alternative

Table 12
Checklist for Identifying Potential Cumulative Impacts of the Proposed Action

Resource	Without Proposed Action	With Proposed Action		Past Actions	Other Present Actions	Other Future Actions	Proposed Action's Incremental Cumulative Impact
		Construction	Operation				
Geology and Soils	♦	S[1]	♦	M	♦	♦	♦
Water and Aquatic Life Resources	♦	S[1]	♦	M	+	♦	♦
Vegetation, Agriculture, and Range Resources	♦	S	S	M	♦	♦	S
Threatened and Endangered Species	♦	S	♦	M	♦	S	♦
Wildlife Resources	♦	S	♦	M	♦	♦	♦
Land Use and Recreation	♦	S[1]	♦	M	♦	♦	♦

Table 12
Checklist for Identifying Potential Cumulative Impacts of the Proposed Action

Resource	Without Proposed Action	With Proposed Action		Past Actions	Other Present Actions	Other Future Actions	Proposed Action's Incremental Cumulative Impact
		Construction	Operation				
Cultural and Historical Resources and Native American Consultations	♦	♦	♦	M	♦	♦	♦
Social and Economic Conditions	S	+	+	♦	♦	♦	+
Transportation and Traffic	♦	♦	♦	♦	♦	♦	♦
Air Quality and Noise	♦	S[1]	♦	S	♦	♦	♦

KEY: ♦ = no change S = slight adverse impact S[1] = temporary, slight adverse impact
M = moderate adverse impact H = high adverse impact + = beneficial impact

4.3. Environmental Consequences

Based on the evaluations of past, present, and future actions that could have a cumulative impact on resources affected by the Proposed Action, it was determined that a slight adverse impact to vegetation resources and a beneficial impact to social and economic conditions would occur if the Proposed Action is developed. Other resources considered and listed in Table 12 are anticipated to have no incremental cumulative impact when evaluated with past, present, and future actions.

4.3.1. 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 currently be recovered.

Agricultural practices throughout the region 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 pipeline construction 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 Proposed Action, the cumulative impacts on soils resulting from construction of the Proposed Action 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 Proposed Action Areas/Connected Action Areas. Clearing and grading associated with construction of the Proposed Action and other projects in the vicinity could increase soil erosion in the area. 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. 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 Action.

There are smaller diameter, unregulated, crude oil gathering lines that have leaked and affected soil and ground/surface water. These pre-existing lines have limited cathodic protection (external corrosion protection) and as such they are not routinely monitored. The DAPL Project is the construction of a regulated large diameter crude oil transmission line and, as discussed throughout this document, is highly regulated and monitored. The cumulative impacts of this pipeline are minimized by the regulatory criteria, the monitoring, protections and response implemented by Dakota Access during the operation of the pipeline.

4.3.2. Water and Aquatic Life Resources

Cumulative impacts on water resources (i.e., groundwater, surface waters, wetlands) associated with the Proposed Action 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. Spill response and remediation measures associated with construction activities are discussed in detail in Dakota Access' SWPP and SPCC (Appendix B).

Recently completed construction or current construction within the vicinity of the Proposed Action 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 within the Proposed Action Areas/Connected Action Areas 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 two major rivers crossed in the Proposed Action Areas/Connected Action Areas and implementing the erosion and sediment control measures specified in the SWPPP (Appendix B), the potential for increased sediment loading from terrestrial sources is minimized and the cumulative impact 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. 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 the Proposed Action Areas during HDD activities, 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 C). 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 Action would be temporary and short term. Therefore, these impacts, when evaluated with other oil and gas development and infrastructure projects in the region, 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 Action, 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 and 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 DAPL Project. Operational risks are being mitigated by the DAPL Project design; the Proposed Action would be designed to meet or exceed the applicable federal regulations as detailed in Sec 3.12 - 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 Proposed Action along with the other potential projects and activities could result in cumulative impacts on existing wetlands in the Proposed Action Areas/Connected Action Areas 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 Proposed Action Areas/Connected Action Areas would be minimal.

4.3.3. Vegetation, Agriculture, and Range Resources

Land cover in the Proposed Action Areas/Connected Action Areas is comprised mostly of cultivated crops and deciduous forest. Other present land cover types include pasture/hay/grassland areas, open waters, woody wetlands, emergent herbaceous wetlands, and small developed areas, which are primarily roads. Regionally, the greatest impact to the native vegetative community is associated with past and current agricultural practices. Examples of general impacts (from any type of project) 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. Modification of vegetation resources, when considered with impacts of past actions, may result in a slight adverse impact to vegetation resources.

Temporary impacts to land cover would occur in essentially all areas within the construction footprint, the vast majority of which would return to pre-construction conditions following construction. Therefore, long-term impact to agricultural or range lands is not expected, as those areas would be restored and allowed to return to pre-construction land use practices. The only exception is within the forested areas along the permanent DAPL easement that intersects the federal flowage easements north of Carlyle Lake. While trees would be cleared within the construction workspace to accommodate construction, a 30-foot-wide ROW would be maintained to prevent the regrowth of trees in the future. Other areas temporarily impacted during construction would be returned to pre-construction contours and allowed to revegetate to natural conditions. The resulting overall cumulative impact to vegetation, agriculture, and range resources is considered slight when compared to overall available resources in the region, and the negligible impact anticipated to these resources from present or future actions.

4.3.4. 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 Proposed Action Areas/Connected Action Areas. 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.

Habitat loss and modification are the primary threats to the continued existence of Piping Plover, Decurrent False Aster, Eastern Prairie Fringed Orchid, Prairie Bush Clover, Higgins Eye Pearlymussel, Spectaclecase Mussel, Gray Bat, Indiana Bat, and Rattlesnake-Master Borer Moth. Cumulative impacts to the Northern Long-Eared Bat are a result of white noise syndrome, a fungal disease associated with the mortality of bats across North America. The potential cumulative impacts from oil and gas activities in the region on the current listing or potential elevated future listing of these ten species are discussed in detail below.

4.3.4.1. Northern Long-Eared Bat

The USFWS has issued the Final 4(d) rule, for the Northern Long-Eared Bat, 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." The implementation of the Final 4(d) rule for the Northern Long-Eared Bat exempts certain activities within the WNS buffer zone – those areas within 150 miles of WNS-positive counties – provided certain conservation measures are implemented. In areas outside of the 150-mile WNS buffer zone, incidental take from lawful activities is not prohibited. Incidental take is also not prohibited within the WNS buffer for lawful activities outside of a 0.25-mile radius from known hibernacula. The 4(d) rule does prohibit incidental take that may occur from tree removal activities within 150 feet of a known occupied maternity roost tree. The construction, maintenance and operation of the DAPL Project within Proposed Action Areas/Connected Action Areas would not further contribute to the spread of WNS and is not anticipated to result in incidental take in violation of the final 4(d) rule. Further, since no known maternity colonies or hibernacula are known to occur within the Proposed Action Areas/Connected Action Areas, the unlikely event of a spill or leak during operation is not anticipated to adversely affect the Northern Long-Eared Bat and, the Proposed Action would not contribute to cumulative impacts to this species. Additionally, the DAPL Project is undergoing ESA Section 7 evaluation with respect a 408 action in North Dakota, where the Northern Long-Eared Bat may occur. The Proposed

Action Areas/Connected Action Areas in North Dakota is outside of the WNS buffer zone and incidental take from lawful activities is not prohibited. Therefore, it is not expected that the combined impacts of the Proposed Actions in North Dakota and Illinois would contribute to cumulative impacts to the species.

4.3.4.2. Indiana Bat

The USFWS (2007) Draft Recovery Plan for the Indiana Bat (*Myotis sodalis*) specifically addresses the potential impacts of energy development such as oil spills, production wells, and pipeline leaks on Indiana Bat. It states that oil pits from well productions and spills into waterways or sinkholes leading into a hibernacula may pose a threat. The Indiana Bat 5-Year Review (2009a) also indicates that environmental impacts, including oil spills, may cause potential impacts on the species. Since no known maternity colonies or hibernacula are located within the Proposed Action Areas/Connected Action Areas, the unlikely event of a spill or leak would not be expected to impact these habitats. To further minimize the potential for impacts to this species, potential roosting and foraging habitat in the Proposed Action Areas/Connected Action Areas will be cleared in the winter. Therefore, the Proposed Action would not result in further loss of maternal or hibernacula habitats for the Indiana Bat and would therefore not contribute to cumulative impacts to this species.

4.3.4.3. Gray Bat

The USFWS does not specifically address oil and gas activities as a potential or ongoing threat for the Gray Bat in the 5-Year Review (2009b). Historically, the Gray Bat's decline can be contributed to the result of human disturbances (i.e. vandalism and disturbances to hibernacula and maternity caves). In addition to human disturbances, the decline of the Gray Bat can also be contributed to natural and man-made flooding (of caves and mines), impoundments of waterways, and contamination from pesticides (USFWS, 2009b). This species lives in caves year-round. In the summer, they roost in caves which are scattered along rivers. No caves or mines were identified in the Proposed Action Areas/Connected Action Areas. The Proposed Action is not anticipated to result in the further loss of potential habitats for the Gray Bat and would therefore not contribute to cumulative impacts to this species.

4.3.4.4. Higgins Eye Pearlymussel

According to the USFWS, a portion of the range of the Higgins Eye Pearlymussel is on the Mississippi River north of Lock and Dam 19 at Keokuk, Iowa (USFWS, 2012b). However, the remaining stronghold of the species in the Mississippi River is located at Cordova, Illinois, approximately 130 river miles north of the pipeline crossing. The USFWS does not specifically address oil and gas activities as a potential or ongoing threat for the Higgins Eye Pearlymussel in the 5-Year Review (2006). The primary threats to the Higgins Eye Pearlymussel are impoundments, particularly the locks and dams on the Mississippi, degraded water quality due to sedimentation and toxic contaminants, disease and predation, and invasive non-native species (USFWS, 2006). Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary. Pollution from accidental spills may directly kill mussels, but they may also indirectly harm Higgins Eye Pearlymussel by reducing water quality, affecting the ability of surviving mussels to reproduce, and lowering the numbers of host fish. In Illinois, potentially suitable habitat for the Higgins Eye Pearlymussel is only present where the Proposed Action crosses the Illinois River in Pike County. The Illinois River would be crossed using a HDD construction method, where Dakota Access would be providing line pipe steel with a 0.625-inch wall thickness. This thicker line pipe provides would allow a higher operating pressure that is approximately 46% stronger than the thickness required by regulation (Wood Group Mustang, 2015). It is unlikely that a leak or spill would occur with the

Proposed Action Areas/Connected Action Areas and even less likely to occur in the HDD areas. Additionally, the pipeline would be placed at least 40 feet below the riverbed, thereby avoiding impacts to the Higgins Eye Pearlymussel and its potential habitat. The Proposed Action is not anticipated to result in further loss of potential habitats for the Higgins Eye Pearlymussel and would therefore not contribute to cumulative impacts to this species.

4.3.4.5. Spectaclecase Mussel

The USFWS does not specifically address oil and gas activities, as a potential or ongoing threat for the Spectaclecase Mussel in the Recovery Outline (USFWS, 2014b). The primary decline for the species is habitat loss as a result of impoundments, channelization, chemical contaminants, mining, and sedimentation (USFWS, 2014b). Adult mussels are easily harmed by toxins and degraded water quality from pollution because they are sedentary. Pollution from accidental spills may directly kill mussels, but they may also indirectly harm spectaclecase by reducing water quality, affecting the ability of surviving mussels to reproduce, and lowering the numbers of host fish. In Illinois, potentially suitable habitat for the Spectaclecase Mussel is only present where the Proposed Action crosses the Illinois River in Pike County. The Illinois River would be crossed using a HDD construction method, where Dakota Access would be providing line pipe steel with a 0.625-inch wall thickness. This thicker line pipe provides would allow a higher operating pressure that is approximately 46% stronger than the thickness required by regulation (Wood Group Mustang, 2015). It is unlikely that a leak or spill would occur with the Proposed Action Areas and even less likely to occur in the HDD areas. Additionally, the pipeline would be placed at least 40 feet below the riverbed, thereby avoiding impacts to the Spectaclecase Mussel and its potential habitat. The Proposed Action is not anticipated to result in further loss of potential habitats for the Spectaclecase Mussel and would therefore not contribute to cumulative impacts to this species.

4.3.4.6. Piping Plover

The USFWS (2009d) 5-Year Review for the Piping Plover does specifically address threats from oil and gas activities. 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. The Proposed Action is not expected to have any permanent impacts on Piping Plover habitat during construction or operation, and in the unlikely event of a spill or leak, impacts would be localized. Therefore, the Proposed Action is not expected to have a cumulative impact to the Piping Plover. Additionally, the DAPL Project also underwent ESA Section 7 evaluation with respect to a 408 action in North Dakota, where the Piping Plover is also listed. However, because no suitable Piping Plover habitat is present in the 408 Action Areas in Illinois, the USACE made a "*no effect*" determination for Illinois and a "*may affect, but is not likely to adversely affect*" the piping plover for North Dakota. The USFWS concurred with this determination in a letter dated 2 May 2016. Therefore, it is not expected that the combined impacts of the North Dakota and Illinois 408 actions would contribute to cumulative adverse impacts on Piping Plovers.

4.3.4.7. Decurrent False Aster

The USFWS does not specifically address oil and gas activities as a potential or ongoing threat for the Decurrent False Aster in either the 5-Year Review (2012a) or the Recovery Plan (1990). Dramatic changes in the flood cycle this last century due to the construction of navigation dams and agricultural levees

threatens the Decurrent False Aster (USFWS, 1990). Impoundment of the Illinois River prolongs high water events during the growing season reducing available habitat and leading to the decline of the species (USFWS, 2012a). Additionally, the majority of this species' preferred habitat has been eliminated by agricultural processes, such as draining wet prairies for use as cropland (USFWS, 1988a). The Proposed Action would not result in further loss of potential habitats for the Decurrent False Aster and would therefore not contribute to cumulative impacts to this species.

4.3.4.8. Eastern Prairie Fringed Orchid

The USFWS does not specifically address oil and gas activities as a potential or ongoing threat for the Eastern Prairie Fringed Orchid in the Recovery Plan (1999). Historically, the Eastern Prairie Fringed Orchid's early decline was a result of the conversion of the species natural habitat to cropland and pasture. Currently, this species is in decline from the drainage and development on wetlands and the encroachment of woody vegetation and non-native species (USFWS, 2015b). The Proposed Action would not result in further loss of potential habitats for the Eastern Prairie Fringed Orchid and would therefore not contribute to cumulative impacts to this species.

4.3.4.9. Prairie Bush Clover

The USFWS does not specifically address oil and gas activities as a potential or ongoing threat for the Prairie Bush Clover in the Recovery Plan (1988b). Agricultural practices, including row crops and herbicides, have contributed to the decline of this species. In addition, encroachment of woody species, loss of pollination species, disease, predation, fires, and grazing have all contributed to this species' decline (USFWS, 1988b). The Proposed Action is not anticipated to result in further loss of potential habitats for the Prairie Bush Clover and would therefore not contribute to cumulative impacts to this species.

4.3.4.10. Rattlesnake-Master Borer Moth

The USFWS does not specifically address oil and gas activities, as a potential or ongoing threat for the Rattlesnake-Master Borer Moth in the Federal Register Notice of 12-Month Finding: Listing Warranted but Precluded (2013). The conversion of prairie for agricultural use has caused the greatest decline in this species. The grazing of livestock, flooding, invasive species, and successional plants have also been a contributing factor to habitat loss for this species (USFWS, 2013). The Proposed Action would not result in further loss of potential habitats for the Rattlesnake-Master Borer Moth and would therefore not contribute to cumulative impacts to this species.

Based on the pipeline route and the utilization of HDDs, the Proposed Action is not likely to contribute to cumulative impacts to the listed species, including aquatic species as discussed in Section 3.4. 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. In addition, enhanced measures for the design and operation of the Proposed Action meet, and often exceed, applicable regulations which further reduces the risk for a spill or leak.

4.3.5. 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 Action impacts, as well as those associated with the oil and gas industry on a regional basis and Connected Actions would be nominal. This is due to the short duration and small scale of the Proposed Action relative to the regional landscape and the large scale of agricultural activities in the region.

The Proposed Action would not permanently alter the character of the majority of available habitats as most impacts are expected to be temporary (see Section 4.3.3 for a discussion of vegetation impacts associated with the Proposed Action). Possible temporary, short-term impacts on wildlife include the temporary 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 Action or other oil and gas developments in the region would be negligible and is not anticipated to significantly contribute to cumulative effects on wildlife.

4.3.6. Land Use and Recreation

Regional oil and gas development and related activities could cause temporary, short-term impacts to land use and recreation in the Proposed Action Areas/Connected Action Areas. However, incremental increases are not anticipated based on the design of this Proposed Action 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. Because construction would be short term and land use conversion would be minimal, the cumulative impact on land use as a result of the Proposed Action would be temporary and minor.

No impacts to areas of special interests such as the Meredosia National Wildlife Refuge, Carlyle Lake State Fish and Wildlife Area, or Illinois Natural Areas Inventory Sites would occur as a result of the construction of the Proposed Action. Construction activities would occur over a short period of time and would not occur within visible or audible proximity to any of these areas.

The potential cumulative impacts from the Proposed Action on land use and recreation resources resulting from spills would be minor. Although there have been releases of hazardous material from small diameter, unregulated gathering pipelines that have had an adverse effect on land use and recreation resources, it is highly unlikely for an unanticipated release to occur within the Proposed Action Areas/Connected Action Areas during operations of the DAPL pipeline, which is subject to DOT construction regulations and pipeline leak detection monitoring guidelines.

In the event of an unanticipated release during operations of the pipeline, the effects would be remediated following the cleanup procedures and remediation activities described in Section 3.12. Cumulatively, the impacts associated with land use and recreation resources would be minimal.

4.3.7. Cultural and Historic Resources

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, Illinois SHPO, and Native American tribes, to be eligible for listing in the 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 resource areas, and would be closely monitored by Environmental Inspection staff. If an unanticipated discovery occurs during construction, Dakota Access would follow the measures described in its UDP (**Appendix I**).

Dakota Access' UDP was developed (**Appendix I**) for use during all DAPL Project construction activities regardless of jurisdiction or landownership. The UDP describes actions that would take place in the event that an undocumented 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.

4.3.8. Social and Economic Conditions

Population, employment, and economic data were collected using Census tracts which are crossed by the Proposed Action and presented in Section 3.10.1. The Proposed Action Areas/Connected Action Areas are in a rural agricultural setting in Morgan, Pike, Scott, and Fayette counties in Illinois. Based on the review of the baseline information within the Proposed Action Areas/Connected Action Areas, the cumulative impact to social and economic conditions would be limited to construction and operation of the Proposed Action. Other past, present and future actions would not be expected to result in incremental cumulative impacts to social and economic conditions.

The Proposed Action would result in employment opportunities for the local workforce during construction. In addition to paid wages, secondary beneficial impacts to the local economy would result through spending at local businesses that provide goods and services to the construction workforce. During operation of the Proposed Action, Dakota Access would pay ad valorem taxes that would benefit the state of Illinois and the local economies. As such, development of the Proposed Action would have a beneficial impact to the social and economic conditions in the region.

4.3.9. Transportation and Traffic

Cumulative impacts from construction of the Proposed Action would temporarily increase traffic in the immediate vicinity of the Proposed Action Areas/Connected Action Areas. This increase in traffic would be temporary and is not expected to result in significant impacts to Illinois' 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 Proposed Action Areas/Connected Action Areas and major delivery routes.

During operations of the Proposed Action, there is expected to be a positive effect on traffic resources in Illinois. Once in operation, Dakota Access plans to transport up to 570,000 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 DAPL Project and other future pipeline projects would be beneficial to the transportation infrastructure in Illinois by decreasing oil hauled by truck traffic and therefore reducing wear and tear on roads and highways.

4.3.10. Air Quality and Noise

Potential cumulative impacts on air quality would result from concurrent construction of the Proposed Action and other development projects in the region. Impacts on air quality associated with construction of the Proposed Action would be temporary and short-term; therefore, even if construction of other projects were concurrent with the Proposed Action, cumulative construction-related air quality impacts would be negligible.

Construction of the Proposed Action 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 construction would be temporary, the contribution of the Proposed Action to cumulative impacts on noise would be negligible.

During construction of the Proposed Action, emissions from fuel-burning internal combustion engines (e.g., transportation trucks, heavy equipment, drill rigs, etc.) would emit GHG. Construction of the HDDs across the McGee Creek levee, the Illinois River, and the Coon Run levees are likely to take eight to twelve weeks to complete. Conventional pipeline construction across the federal flowage easements north of Carlyle Lake would take approximately one month to complete. To reduce the emission of GHG, 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 local or regional climate long-term.

5. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

As required by NEPA, irreversible and irretrievable commitments of resources 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.

5.1. USACE

Aside from the commitment of funds, labor, and office materials for document preparation, there would be no irreversible or irretrievable resource commitments due to the Proposed Action (authorization to cross federal USACE projects and flowage easement).

5.2. DAPL

Construction activities associated with the Proposed Action 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 Proposed Action.

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 the Proposed Action 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. 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 of 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 SWPPP. The SWPPP 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 SWPPP and SPCC describe 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 SWPPP and SPCC 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
- Restoration and revegetation procedures
- Refueling and waste management procedures
- Stormwater management procedures

Dakota Access incorporates environmental requirements into all construction specifications and the SWPPP 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 SWPPP, the Proposed Action would be constructed in accordance to the measures detailed in Dakota Access' SPCC, 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.

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. These mitigation measures, as described in Sections 3.1 through 3.14, 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. FEDERAL, TRIBAL, STATE, AND LOCAL AGENCY CONSULTATION AND COORDINATION

A Public Notice announcing the preparation of a NEPA document and solicitation of comments from the public; federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of the proposed activity was posted by the USACE from 5 January 2016 through 5 February 5 2016. A copy of this Public Notice and the Distribution List, as well as Comments received and Responses, are provided in Appendix J. In addition to the Public Notice, the USACE consulted with the Illinois Historic Preservation Agency, the USFWS, and the Illinois Department of Natural Resources, as well as Native American groups to solicit comments for the Proposed Action within the USACE Section 408 Proposed Action Areas/Connected Action Areas (see Appendix K). Table 13 includes a listing of individuals and agencies consulted during preparation of the EA regardless of whether a response was received.

Table 13
Agency/Entity Consultation List

Agency/Entity	Name	Address	Date Received
Delaware Tribe of Indians	Chief Chester Brooks	5100 Tuxedo Blvd Bartlesville, Oklahoma 74006	No Response
Delaware Nation, Oklahoma	President Kerry Holton	P.O. Box 825 Anadarko, Oklahoma 73005	No Response
Ho-Chunk Nation of Wisconsin	President Wilfrid Cleveland	P.O. Box 667 Black River Falls, Wisconsin 54675	No Response
Winnebago Tribe of Nebraska	Chairwoman Darla Lapointe	P.O. Box 687 Winnebago, Nebraska 68071	Received response on Mar 14, 2016
Sac & Fox Nation, Oklahoma	Principal Chief Kay Rhodes	920883 S. Hwy. 99 Building A Stroud, Oklahoma 74079	No Response
Sac & Fox Tribe of the Mississippi in Iowa	Chairman Tony Wanatee	349 Meskwaki Road Tama, Iowa 52339	Received response on Mar 17, 2016
Sac & Fox Nation of Missouri in Kansas and Nebraska	Chairman Edmore Green	305 N. Main Street Hiawatha, Kansas 66434	No Response
Kickapoo Tribe of Oklahoma	Chairman David Pacheoco	P.O. Box 70 McCloud, Oklahoma 74851	No Response
Kickapoo Tribe of Indians of the Kickapoo Reservation in Kansas	Chairman Lester Randall	P.O. Box 271 Horton, Kansas 66439	No Response
Hannahville Indian Community, Michigan	Chairman Kenneth Meshigand	N14911 Hannahville Blvd. Rd. Wilson, Michigan 49896-9728	No Response

Table 13 Agency/Entity Consultation List			
Agency/Entity	**Name**	**Address**	**Date Received**
Citizen Potawatomi Nation, Oklahoma	Chairman John Barrett	1601 S. Gordon Cooper Drive Shawnee, Oklahoma 74801	No Response
Forest County Potawatomi Community, Wisconsin	Chairman Harold Frank	P.O. Box 340 Crandon, Wisconsin 54520	No Response
Pokagon Band of Potawatomi Indians, Michigan and Indiana	Chairman John P. Warren	P.O. Box 180 Dowagiac, Michigan 49047	No Response
Nottawaseppi Band Huron of the Potawatomi, Michigan	Chairman Homer Mandoka	2221—1 ½ Mile Road Fulton, Michigan 49052	No Response
Prairie Band Potawatomi Nation	Chairwoman Liana Onnen	Government Center 16281 Q Road Mayetta, Kansas 66509	No Response
Match-e-be-nash-she-wish Band of Potawatomi Indians of Michigan	Chairman D.K. Sprague	P.O. Box 218 Dorr, Michigan 49323	No Response
Peoria Tribe of Indians of Oklahoma	Chief John Froman	P.O. Box 1527 118 S. Eight Tribes Trail Miami, Oklahoma 74355	No Response
The Quapaw Tribe of Indians	Chairman John Berrey	P.O. Box 765 Quapaw, Oklahoma 74363	No Response
Miami Tribe of Oklahoma	Chief Douglas Lankford	P.O. Box 1326 202 S. Eight Tribes Trail Miami, Oklahoma 74355	Received response on March 1, 2016
The Osage Nation	Principle Chief Geoffrey Standing Bear	P.O. Box 779 Pawhuska, Oklahoma 74056	Received response on Feb 2, 2016
Iowa Tribe of Kansas and Nebraska	Chairman Tim Rhodd	3345 Thrasher Road # 8 White Cloud, Kansas 66094	Received response on Jan 29, 2016
Iowa Tribe of Oklahoma	Chairman Bobby Walkup	Route 1, Box 721 Perkins, Oklahoma 74059	No Response
Absentee-Shawnee Tribe of Indians of Oklahoma	Governor Edwina Butler-Wolfe	2025 S. Gordon Cooper Drive Shawnee, Oklahoma 74810-9381	No Response
Eastern Shawnee Tribe of Oklahoma	Chief Glenna J. Wallace	P.O. Box 350 Seneca, Missouri 64865	No Response

Table 13
Agency/Entity Consultation List

Agency/Entity	Name	Address	Date Received
Shawnee Tribe	Chairman Ron Sparkman	P.O. Box 189 Miami, Oklahoma 74355	No Response
Cherokee Nation	Principal Chief Bill John Baker	P.O. Box 948 Tahlequah, Oklahoma 74465	No Response
United Keetoowah Band of Cherokee Indians in Oklahoma	Chief George Wickliffe	P.O. Box 746 Tahlequah, Oklahoma 74464	Received response on Feb 27, 2016
Delaware Tribe of Indians	Chief Chester Brooks	5100 Tuxedo Blvd Bartlesville, Oklahoma 74006	No Response
Delaware Nation, Oklahoma	President Kerry Holton	P.O. Box 825 Anadarko, Oklahoma 73005	No Response
U.S. Fish and Wildlife Service	Kraig McPeek Project Leader Illinois and Iowa Field Office	Illinois/Iowa Ecological Services Field Office 1511 47111 Avenue Moline, IL. 61265	Received response on 2 May 2016
Illinois Historic Preservation Agency	Dr. Rachel Leibowitz	Illinois Historic Preservation Agency 1 Old State Capital Plaza Springfield, Illinois 62701-1507	Received responses on 21 March and 28 March 2016
Illinois Department of Natural Resources	Dr. James Herkert, Director Office of Resource Conservation	One Natural Resources Way Springfield, Illinois 62702-1271	Received response on 25 February 2016
McGee Creek Drainage & Levee District	Len L. Wiese, Chairman	R.R #1, Box 86 168 1425E Ave. Versailles, IL 62378-2130	Received response on 28 July 2016
Coon Run Drainage & Levee District	Mr. Tom Burrus, Chairman	826 Arenzville Road Arenzville, IL 62611	Awaiting response

* For interested parties notified by e-mail, see Appendix J.

8. STATUS OF ENVIRONMENTAL COMPLIANCE

Table 14 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 the Proposed Action covered by this EA.

Table 14
Environmental Permits, Approvals, and Consultations

Jurisdiction	Guidance	Status	Requirement or Action	Degree of Compliance
Federal Statutes				
USACE	Clean Water Act, as Amended 33 U.S.C. 466 et seq, Section 404	Filed: 12/30/2014; 03/27/2015	NWP 12, Section 404 Waters	PC[2]
	Rivers and Harbors Acts, as Amended 33 U.S.C. 401, 403, 407 et seq.	Filed: 12/30/2014; 03/27/2015	NWP 12, Section 10 Waters	PC[2]
USACE	National Environmental Policy Act, as Amended, 42 U.S.C. 4321, et seq.	Pending	Compliance under 408 Permission	PC[3]
USEPA	Clean Air Act, as Amended, 42 U.S.C. 7609	Complete	Compliance under 408 Permission	FC
USDOA	Farmland Protection Policy Act, 7 U.S.C. 4201, et seq.	Complete	Compliance under 408 Permission	FC
USFS	Wild and Scenic River Act, 16 U.S.C. 1271, et seq.	Complete	Compliance under 408 Permission	FC
USFWS	Endangered Species Act, as Amended, 16 U.S.C. 1531. et seq.	Pending	Compliance under 404/10/408 Permit / Permission	FC
USFWS	Fish and Wildlife Coordination Act, as Amended, 16 U.S.C. 4601, et seq.	Complete	Compliance under 408 Permission	FC
USFWS	Bald Eagle Protection Act, 16 U.S.C. 668-668c	Complete	Compliance under 408 Permission	FC
State				
Illinois Commerce Commission	Certificate of Public Convenience and Necessity	Clearance Date: 12/22/2015	State Certificate	FC
Illinois Environmental Protection Agency	NDPES Individual Permit for Discharges for Hydrostatic Test Water	Filed: 4/28/2016	Compliance for state permit	PC[2]

Table 14 Environmental Permits, Approvals, and Consultations				
Jurisdiction	**Guidance**	**Status**	**Requirement or Action**	**Degree of Compliance**
Illinois Environmental Protection Agency	Clean Water Act, as Amended 33 U.S.C. 466 et seq. Section 401	Pending	Compliance under 401 Permit	PC[2]
Illinois Department of Natural Resources	State Listed Threatened and Endangered Species Consultation/Clearance (Incidental Take Permit)	Clearance Date: 2/25/2016	State-listed species	FC
Illinois Historic Protection Agency (IHPA-Illinois SHPO)	Consultation and Inventory Permit; National Historic Preservation Act Section 106 Consultation/Compliance	Clearance Date: 3/30/2016	Compliance under 404/10/408 Permit / Permission	FC

FC = Full Compliance, PC = Partial Compliance.
1. Full compliance will be attained after all required archaeological investigations, reports and coordination have been completed.
2. Full compliance will be attained upon completion of any permitting requirements or coordination with other agencies.
3. Full compliance will be attained upon completion and signing of NEPA documents.

Table 15 provides a summary of the environmental mitigation measures discussed throughout this EA that Dakota Access has committed to as part of the Proposed Action design to avoid or minimize potential impacts on environmental and human resources throughout construction and operation activities.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
Geology and Soils	To protect the terrain of the Proposed Action Areas/Connected Action Areas, 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 F).
	Dakota Access, in accordance with Illinois One-Call (Julie), 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Dakota Access has completed a geotechnical analysis of the HDDs crossing the Illinois River and McGee Creek Levee, the Illinois Coon Run Levees, and the Kaskaskia River to facilitate engineering and design, including selection of appropriate materials and construction methods to limit any environmental impacts.
	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 I) 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 Illinois State Historic Preservation Officer. 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 AIMP 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.
	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 HDD workspace sites would be cleared, graded and matted as needed to minimize rutting and compaction.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Permanent impacts to soils would be avoided through the application of BMPs during construction, restoration, and post-construction revegetation management, as outlined in the SWPPP (Appendix B).
Water Resources	Impacts to the Illinois and Kaskaskia Rivers would be minimized by using HDD construction methods to install the proposed pipeline underneath these rivers.
	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 through beneficial use by land farming.
	Dakota Access would conduct all HDD work according to the HDD Construction Plan that it has prepared, and implement the HDD Contingency Plan in the event of an inadvertent release.
	Water withdrawal from the Illinois or Kaskaskia Rivers would comply with all applicable permit conditions and regulations. Temporary water pumps would be placed within secondary containment 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 would be conducted in accordance with applicable permits.
	Discharged hydrostatic test water would not contain additives.
	Where appropriate, water would be discharged into an energy dissipation and/or filtering device as described in Dakota Access' SWPPP (Appendix B) to remove sediment and to reduce the erosive energy of the discharge.
	Fuel and all other hazardous materials would be stored in accordance with the requirements of Dakota Access' SPCC and SWPPP. These documents also describe response, containment, and cleanup measures.
	EIs would monitor compliance with applicable waterbody protection requirements during construction of the facilities. The DAPL Project SWPPP (Appendix B) describes 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	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 DAPL Project specific SPCCs prepared by the contractor and in Dakota Access' SPCC Plan (Appendix B).
	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 to minimize impacts to forested wetlands, reducing the normal construction workspace from 125 feet to 85 feet wide.
	Unavoidable impacts to forest wetlands will be offset through mitigation. Dakota Access will mitigate temporary impacts to forested wetlands at a mitigation to impact ratio of 1.5:1 and permanent conversion to forested wetlands at mitigation to impact ratio of 2:1.
	Dakota Access is in the process of obtaining verification for use of Nationwide Permit 12 for the crossing of the Illinois River (Section 10 authorization) and for crossing of wetlands and streams (Section 404) within the Carlyle Lake flowage easements.
	The DAPL Project SWPPP and SPCC 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 SPCC also specifies that equipment must be refueled at least 100 feet from waterbodies unless, due to site-specific conditions, there is no practical alternative. In that case, the contractor must implement site-specific protective measures and containment procedures described in the SPCC. 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.
	The DAPL 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Remotely operated above-ground mainline valve sites would be installed on both sides of the Illinois River and Carlyle Lake flowage easements crossings for isolation in the event of an emergency shutdown.
Vegetation, Agriculture, and Range Resources	Within areas disturbed by construction of the DAPL Project, and not being actively cultivated, including the Carlyle lake flowage easements, 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.
	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.
	At stream approaches, the contractor would leave a minimum of a 10-foot buffer (up to 30-foot depending on site conditions at the time of clearing) 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.
	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.
Wildlife Resources	In the unlikely event that a listed species is encountered within the Proposed Action Area during construction, construction activities would stop and the USFWS would be contacted.
	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 during construction, construction activities would stop and the USFWS would be contacted.
	Potential roosting habitat for the Indiana Bat and Northern Long-Eared Bat would be removed in the wintertime (between October 1 and March 31) to avoid adverse impacts to these species

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
Aquatic Resources	A successfully completed HDD crossing would avoid aquatic resource impacts to the Illinois and Kaskaskia rivers since the pipeline would be installed without disturbing the aquatic and benthic environments.
	HDD operations conducted for the Illinois River and McGee Creek Levee, Coon Run Levees, and Kaskaskia River 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 Illinois and Kaskaskia 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 Illinois River and Kaskaskia 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 Illinois and Kaskaskia Rivers would be avoided or minimized by placing the pump within a secondary containment structure.
	For portions of the pipeline installed by HDD, 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 Illinois or Kaskaskia Rivers.
	Adherence to the Geographic Response Plans for Illinois River, Coon Run Levee, and Kaskaskia River would minimize potential impacts on aquatic wildlife from potential spills during the operation of the pipeline.
	Conduct emergency response drills/exercises in accordance with the National Preparedness for Response Exercise Program (PREP) consisting of table top exercises and equipment deployment drills. Dakota Access is committed to conducting a worst case discharge full scale exercise at either the Illinois or Kaskaskia River once every 6 years and will include both open water and ice response. Dakota Access will alternate the location and type of exercise.
	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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
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 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 farming 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 Proposed Action Area. Based on the result of these efforts, no properties considered to be eligible, or potentially eligible for listing in the National Register of Historic Places (NRHP) would be adversely impacted by the Proposed Action or Connected Action.
	Impacts to a potentially NRHP-eligible site, 11ST582, would be avoided via HDD.
	Impacts to a potentially NRHP eligible site, 11ST192, would be avoided by crossing a portion of the site with a timber-mat travel lane in an active agricultural field. No subsurface disturbance within this site would be allowed in order to preserve any buried cultural deposits that may occur at this location.
	Dakota Access' UDP was developed (Appendix I) 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
Hazardous Waste	In the unlikely event contamination is encountered during construction, the UDP (Appendix I) 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 DAPL 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 DAPL Project facilities.
	A Computational Pipeline Monitoring System (CPM) would be utilized to monitor the pipeline for leaks.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	LeakWarn is being tailored to the DAPL 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 construction to the minimum amount necessary to complete the Proposed Action. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime).

9. LIST OF PREPARERS AND REVIEWERS

Dakota Access, in cooperation with the USACE Preparers, reviewers, consultants and federal officials include the following (Table 16):

Table 16
List of Preparers and Reviewers

Name	Title/Office	Agency
St. Louis District Planning Staff	Ecologist, Environmental Compliance Section	USACE, St. Louis District
St. Louis District Regulatory Staff	Regulatory Project Manager, Regulatory Branch	USACE, St. Louis District
Rock Island District Cultural Resources Staff	Archaeologist, Regulatory Branch	USACE, Rock Island District
St. Louis District Tribal Resources Staff	Cultural Anthropologist, Curation and Archives Analysis Branch	USACE, St. Louis District
St. Louis District Geotechnical Engineers	Regional Technical Specialist, Geotechnical Branch	USACE, St. Louis District
St. Louis District Engineering & Construction Division Engineers	Program Manager, Levee Safety	USACE, St. Louis District
St. Louis District Operations Staff	Natural Resources Specialist	USACE, St. Louis District
St. Louis District Readiness Branch Staff	Program Manager, Readiness Branch	USACE, St. Louis District
St. Louis District Real Estate Branch Staff	Real Estate Division	USACE, St. Louis District
St. Louis District Attorney	Office of Counsel	USACE, St. Louis District
Monica Howard	Director Environmental Sciences	Dakota Access, LLC
Marc Hess	Environmental Specialist	Burns & McDonnell
Lane Martinez	Environmental Specialist	Burns & McDonnell
Nathan Olday	Environmental Project Manager	Burns & McDonnell

10. ACRONYMS, INITIALS, AND ABBREVIATIONS

ANSI	American National Standards Institute
API	American Petroleum Institute
ATWS	additional temporary workspace
BMPs	best management practices
bpd	barrels per day
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cm	centimeter
Company	Energy Transfer Company
Corps	U.S. Army Corps of Engineers
CPM	Computational Pipeline Monitoring System
CWA	Clean Water Act
DA	Department of the Army
Dakota Access	Dakota Access, LLC
DAPL	Dakota Access Pipeline
dB	decibels
dbh	diameter at breast height
DOT	Department of Transportation
EA	Environmental Assessment
ECDs	erosion control devices
ECP	erosion control plan
EI	Environmental Inspector
EO	Executive Order
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Maps
GIS	geographic information systems
HARGIS	Historic and Architectural Resources Geographic Information System
HDD	horizontal directional drill
ICS	Incident Command System
IEPABA	Illinois Environmental Protection Agency Bureau of Air
IHPA	Illinois Historic Preservation Agency
ILDNR	Illinois Department of Natural Resources
L_{dn}	Day-Night Average Sound
m	meter
MNDNR	Minnesota Department of Natural Resources
MNFI	Michigan Natural Features Inventory
MSL	mean sea level

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NHPA	National Historic Preservation Act
NIMS	National Incident Management System
NLCD	National Land Cover Dataset
NRCS	Natural Resources Conservation Service
NRHP	National Registry of Historic Places
NSF	National Science Foundation
NWI	National Wetland Inventory
NWP 12	Nationwide Permit 12
OCC	Operations Control Center
OSHA	Occupational Safety and Health Administration
PA	Programmatic Agreement
PEM	palustrine emergent
PFO	palustrine forested
PHMSA	Pipeline and Hazardous Materials Safety Administration
PSS	palustrine scrub-shrub
RCRA	Resource Conservation and Recovery Act
RHA	Rivers and Harbors Act
ROW	right-of-way
SCADA	supervisory control and data acquisition
SPCC	Spill Prevention, Control, and Countermeasure
SRST	Standing Rock Sioux Tribe
SWPPP	Stormwater Pollution Prevention Plan
THPO	Tribal Historic Preservation Office
UDP	Unanticipated Discoveries Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WNS	white nose syndrome

11. REFERENCES

Ackerman, D.J. 1980. *Ground-Water Resources of Morton County, North Dakota*. North Dakota Geological Survey Bulletin 7Z – Part III, 51 pp.

Bachman, J. 2014. North Dakota's Downside to the Oil Boom: Traffic Deaths. *Businessweek*. Retrieved from http://www.businessweek.com/articles/2014-06-09/north-dakotas-downside-to-the-oil-boom-traffic-deaths.

Bellassen and Luyssaert. 2014. Carbon Sequestration: Managing Forests in Uncertain Times. *Nature*, 506:153-155.

Burgess, A. 2012. *Animal Diversity Web:* Myotis sodalis. Retrieved February 2015 from http://animaldiversity.org/accounts/Myotis_sodalis/.

Changnon, S. A., J. R. Angel, and K. E. Kunkel. 2004. *Illinois Climate Atlas*. Illinois State Water Survey, Champaign, Illinois.

Council on Environmental Quality (CEQ). 1970. *Environmental Quality, The First Annual Report of the Council on Environmental Quality*. Retrieved from http://files.eric.ed.gov/fulltext/ED062109.pdf.

Council on Environmental Quality (CEQ). 1997. *Environmental Justice: Guidance under the National Environmental Policy Act*. Washington, D.C.: Executive Office of the President.

Cowardin, L. M., V. Carter, F.C. Golet, and E.D. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. Washington, D.C.: U.S. Department of the Interior, Fish and Wildlife Service, Office of Biological Services.

Davies et. al. 1984. Engineering Aspects of Karst. Retrieved March 2016 from http://pubs.usgs.gov/of/2004/1352/.

GeoEngineers Horizontal Directional Drill Design Services. 2015a. *Dakota Access Pipeline Project, Illinois River HDD, Pike and Morgan Counties, Illinois*. For Dakota Access, LLC. August 7, 2015.

GeoEngineers Horizontal Directional Drill Design Services. 2015b. *Dakota Access Pipeline Project, Illinois River East Levee HDD, Scott County, Illinois*. For Dakota Access, LLC. August 6, 2015.

Energy Transfer. 2014. *Company Overview*. Retrieved November 2014 from http://www.energytransfer.com/company_overview.aspx.

The Engineering ToolBox. 2015. *Ldn – Day and Night Sound Level*. Retrieved from http://www.engineeringtoolbox.com/sound-level-d_719.html.

Environmental Protection Agency (EPA). 2015. *NEPA Assist Tool*. Retrieved 17 December 2015 from http://nepassisttool.epa.gov/nepassist/entry.aspx.

Florip, E. 2014. Proposed Oil Terminal Would Be Biggest In Volume. *The Columbian*. Retrieved from http://www.columbian.com/news/2014/nov/24/proposed-oil-terminal-biggest-volume-vancouver/.

Fritelli, J. 2014. *U.S. Rail Transportation of Crude Oil: Background and Issues for Congress*. Congressional Research Service. Retrieved from http://fas.org/sgp/crs/misc/R43390.pdf.

Hoberg, T. and C. Gause. 1992. Reptiles and amphibians of North Dakota. *North Dakota Outdoors*, 55(1):7-19. Jamestown, ND: Northern Prairie Wildlife Research Center. Retrieved from http://www.npwrc.usgs.gov/resource/herps/amrepnd/index.htm.

Horwath, B., and C. Owings. 2014. No Keystone XL Means More Oil By Rail, Report Says. *Oil Patch Dispatch*. Retrieved from http://oilpatchdispatch.areavoices.com/2014/01/31/no-keystone-xl-means-more-oil-by-rail-report-says/.

Illinois Department of Natural Resources (ILDNR). 2015a. *I FISH ILLINOIS.ORG - Illinois River*. Retrieved December 2015 from http://www.ifishillinois.org/profiles/Illinois.php.

Illinois Department of Natural Resources (ILDNR). 2015b. *I FISH ILLINOIS.ORG - Kaskaskia River*. Retrieved December 2015 from http://www.ifishillinois.org/profiles/Kaskaskia.php.

Illinois Environmental Protection Agency Bureau of Air. 2014, August. *Illinois Ambient Air Monitoring 2015 Network Plan*. Retrieved from http://epa.state.il.us/air/monitoring/2015/air-monitoring-network-plan.pdf.

Illinois Environmental Protection Agency Bureau of Air. 2015, September. *Illinois Ambient Air Monitoring 2016 Network Plan*. Retrieved from http://www.epa.illinois.gov/Assets/iepa/air/monitoring/2016/air-monitoring-network-plan.pdf.

Illinois State Geological Survey (ISGS). 2015. *Illinois Water Well Interactive Map*. Retrieved December 2015 from https://www.isgs.illinois.edu/ilwater.

Illinois State Geological Survey (ISGS). 2016. Earthquakes in Illinois: 1795-2015. Available at: http://isgs.illinois.edu/earthquakes

Illinois State Water Survey (ISWS). 2015. *Groundwater*. Retrieved December 2015 from http://www.isws.illinois.edu/wsp/wsground.asp.

Kolata, D.R. 2005. *Bedrock Geology Map of Illinois*. IMAP 14. Illinois State Geological Survey.

Kringstad, J. 2014. *Energy Development and Transmission Committee*. North Dakota Pipeline Authority. Retrieved from https://ndpipelines.files.wordpress.com/2012/04/kringstad-edt-7-8-2014.pdf.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. The National Wetland Plant List: 2014 Update of Wetland Ratings. *Phytoneuron*, 2014-41: 1-42.

Michigan Natural Features Inventory. 2000. *Special plant abstract for* Platanthera leucophaea *(eastern prairie fringed-orchid)*. Retrieved February 2015 from http://mnfi.anr.msu.edu/abstracts/botany/platanthera_leucophaea.pdf.

Minnesota Department of Natural Resources (MNDNR). 2015. *Prairie Bush Clover: A threatened midwestern prairie plant.* Retrieved February 2015 from http://files.dnr.state.mn.us/natural_resources/ets/prairie_bush_clover.pdf.

Multi-Resolution Land Characteristics Consortium. 2011. *National Land Cover Database*. Retrieved from http://www.mrlc.gov/nlcd2011.php.

National Park Service. 2015. *Sleeping Bear Dunes: Nature & Science: Piping Plovers.* Retrieved February 2015 from http://www.nps.gov/slbe/naturescience/pipingplover.htm.

National Wild and Scenic Rivers System. 2016. *Illinois*. Retrieved January 2016 from http://www.rivers.gov/illinois.php.

NatureServe. 2014. *NatureServe Explorer*. Retrieved February 2015 from http://explorer.natureserve.org/.

Nixon, R. 2014. Grain Piles Up, Waiting for A Ride, As Trains Move North Dakota Oil. *New York Times*. Retrieved from http://www.nytimes.com/2014/08/26/us/grain-piles-up-waiting-for-a-ride-as-trains-move-north-dakota-oil.html.

North Dakota GIS Hub Data Portal. 2010. *Earthquake Locations*. Retrieved from https://apps.nd.gov/hubdataportal/srv/en/main.home.

Piskin, K. and R.E. Bergstrom. 1975. *Glacial Drift in Illinois: Thickness and Character*. Illinois State Geological Survey, Circular 490.

Radbruch-Hall, D.H., R.B. Colton, W.E. Davies, I. Lucchitta, B.A. Skipp, and D.J. Varnes. 1982. *Landslide Overview Map of the Conterminous United States*. USGS Landslide Hazards Program. Retrieved from http://landslides.usgs.gov/hazards/nationalmap/.

U.S. Army Corps of Engineers (USACE). 1987. *Corps of Engineers Wetland Delineation Manual*. Technical Report Y-87-1. Vicksburg, MS: U.S. Army Engineer Waterways Experiment Station.

U.S. Army Corps of Engineers (USACE). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*. ERDC/EL TR-10-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

U. S. Army Corps of Engineers (USACE). 2015. *Recent U.S. Climate Change and Hydrology Literature Applicable to U.S. Army Corps of Engineers Missions – Water Resources Region 07, Upper Mississippi*. Civil Works Technical Report, CWTS-2015-13. Washington, D.C.

U.S. Census Bureau. 2015. American Factfinder. Retrieved 17 December 17 2015 from http://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

U.S. Department of Agriculture (USDA), Forest Service. 2003. *Conservation Assessment for Eryngium Root Borer (*Papaipema eryngii*)*. Retrieved January 2016 from http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsm91_054244.pdf.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service. 2006. *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin*. USDA Handbook 296.

U.S. Department of Agriculture (USDA), Natural Resources Conservation Service. 2015. *Soil Survey Geographic Database*. Retrieved December 2015 from http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/geo/.

U.S. Department of Transportation. 2014. *Pocket Guide to Large Truck and Bus Statistics*. Federal Motor Carrier Safety Administration. Retrieved from http://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/docs/FMCSA%20Pocket%20Guide%20to%20Large%20Truck%20and%20Bus%20Statistics%20-%202014%20-%20508C.pdf.

U.S. Department of Transportation. 2015. *Transportation Accidents by Mode*. Office of the Assistant Secretary for Research and Technology. Retrieved from http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/html/table_02_03.html.

U.S. Environmental Protection Agency (USEPA). Appendix A-2. Illinois' 2016 303(d) List (sorted by name). Retrieved from http://www.epa.illinois.gov/Assets/iepa/water-quality/watershed-management/tmdls/2016/303-d-list/appendix-a2.pdf on 30 April 2016.

U.S. Fish and Wildlife Service (USFWS). 1982. *Gray Bat Recovery Plan*. Retrieved February 2015 from http://ecos.fws.gov/docs/recovery_plan/820701.pdf.

U.S. Fish and Wildlife Service (USFWS). 1988a. *Federal Register: Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for* Boltonia decurrens *(Decurrent False Aster), Final rule*. Retrieved February 2015 from http://ecos.fws.gov/docs/federal_register/fr1499.pdf.

U.S. Fish and Wildlife Service (USFWS). 1988b. *Recovery Plan for Prairie Bush Clover (*Lespedeza leptostachya*).* Retrieved February 2015 from http://ecos.fws.gov/docs/recovery_plan/881006.pdf.

U.S. Fish and Wildlife Service (USFWS). 1990. *Decurrent False Aster (*Boltonia decurrens*) Recovery Plan*. Retrieved February 2015 from http://ecos.fws.gov/docs/recovery_plan/900928c.pdf.

U.S. Fish and Wildlife Service (USFWS). 1999*. Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) Recovery Plan*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/plants/pdf/epfoplan.pdf.

U.S. Fish and Wildlife Service (USFWS). 2001. *Piping Plover Fact Sheet*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/pipingplover/pipingpl.html.

U.S. Fish and Wildlife Service (USFWS). 2004a. *Higgins Eye Pearlymussel (*Lampsilis higginsii*) Recovery Plan: First Revision*. Retrieved February 2015 from http://www.fws.gov/midwest/mussel/documents/higgins_eye_recovery_plan_ first_revision.pdf.

U.S. Fish and Wildlife Service (USFWS). 2004b. *South Dakota Field Office: Higgins Eye Pearlymussel*. Retrieved February 2015 from http://www.fws.gov/southdakotafieldoffice/hepm-facts.pdf.

U.S. Fish and Wildlife Service (USFWS). 2005. *Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) Fact Sheet*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/plants/epfo.html.

U.S. Fish and Wildlife Service (USFWS). 2006. *Higgins Eye (*Lampsilis higginsii*) 5-Year Review: Summary and Evaluation*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/clams/pdf/hepm5year06.pdf.

U.S. Fish and Wildlife Service (USFWS). 2007. *Indiana Bat (*Myotis sodalis*) Draft Recovery Plan: First Revision*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/mammals/inba/pdf/inba_fnldrftrecpln_apr07.pdf.

U.S. Fish and Wildlife Service (USFWS). 2009a. *Indiana Bat (*Myotis sodalis*) 5-Year Review: Summary and Evaluation*. Retrieved February 2015 from http://www.fws.gov/Midwest/Endangered/recovery/5yr_rev/pdf/INBA5Yr 30Sept2009.pdf.

U.S. Fish and Wildlife Service (USFWS). 2009b. *Gray Bat (*Myotis grisescens*) 5-Year Review: Summary and Evaluation*. Retrieved February 2015 from http://www.fws.gov/ecos/ajax/docs/five_year_review/doc2625.pdf.

U.S. Fish and Wildlife Service (USFWS). 2009c. *Spotlight Species Action Plan* Lespedeza leptostachya *(Prairie Bush Clover)*. Retrieved February 2015 from http://ecos.fws.gov/docs/action_plans/doc3032.pdf.

U.S. Fish and Wildlife Service (USFWS). 2009d. *Piping Plover (*Charadrius melodus*) 5-Year Review: Summary and Evaluation.* Retrieved February 2015 from http://www.fws.gov/northeast/endangered/PDF/Piping_Plover_five_year_review_and_summary.pdf.

U.S. Fish and Wildlife Service (USFWS). 2010. *Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) 5-Year Review: Summary and Evaluation*. Retrieved February 2015 from http://ecos.fws.gov/docs/five_year_review/doc3273. %20prairie%20fringed%20orchid_Final%20081610.pdf.

U.S. Fish and Wildlife Service (USFWS). 2012a. *Decurrent False Aster (*Boltonia decurrens*) 5-Year Review: Summary and Evaluation*. Retrieved February 2015 from http://ecos.fws.gov/docs/five_year_review/doc4044.pdf.

U.S. Fish and Wildlife Service. 2012b. *Higgins Eye Pearlymussel* Lampsilis higginsii*.* Retrieved February 2015 from http://www.fws.gov/midwest/endangered/clams/higginseye/higgins_fs.html.

U.S. Fish and Wildlife Service (USFWS). 2013. *Federal Register Notice of 12-Month Finding: Listing Warranted but Precluded.* Retrieved March 2016 from http://www.fws.gov/midwest/endangered/insects/rmbm/pdf/rmbmFR12mnthFndng14Aug2013.pdf.

U.S. Fish and Wildlife Service (USFWS). 2014a. *Gray Bat (*Myotis grisescens*) Fact Sheet*. Retrieved February 2015 from https://www.fws.gov/ midwest/endangered/mammals/grbat_fc.html.

U.S. Fish and Wildlife Service (USFWS). 2014b. *Recovery Outline for the Spectaclecase Mussel (*Cumberlandia monodonta*)*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/clams/spectaclecase/pdf/ SpectaclecaseRecoveryOutline.pdf.

U.S. Fish and Wildlife Service (USFWS). 2014c. *Spectaclecase (a freshwater mussel)* Cumberlandia monodonta *Fact Sheet*. Retrieved February 2015 from http://www.fws.gov/midwest/endangered/clams/spectaclecase/ SpectaclecaseFactSheetMarch2012.html.

U.S. Fish and Wildlife Service (USFWS). 2015a. *Endangered Species: Northern Long-Eared Bat* Myotis septentrionalis. Retrieved February 2015 from http://www.fws.gov/Midwest/endangered/mammals/nlba/index.html.

U.S. Fish and Wildlife Service. 2015b. *Eastern Prairie Fringed Orchid (*Platanthera leucophaea*) Fact Sheet.* Retrieved March 2016 from http://www.fws.gov/midwest/endangered/plants/epfo.html.

U.S. Geological Survey (USGS). 2014. *Illinois 2014 Seismic Hazard Map*. USGS Earthquake Hazards Program. Retrieved from http://earthquake.usgs.gov/earthquakes/states/illinois/hazards.php

U.S. Geological Survey (USGS). 2016. ShakeMap Scientific Background. http://earthquake.usgs.gov/earthquakes/shakemap/background.php

Villarini, G., J.A. Smith, and G.A. Vecchi. 2013. Changing frequency of heavy rainfall over the central United States. *Journal of Climate*, 26:351-357.

Voelker, D. C. and R. P. Clarke. 1986. *National Water Summary 1986 – Ground-Water Quality: Illinois*. Retrieved from http://il.water.usgs.gov/pubs/wsp2325.pdf.

Weary, D.J. and D.H. Doctor. 2014. *Karst in the United States: A Digital Map Compilation and Database*. USGS Open-File Report 2014-1156, 23 p.

Weibel, Pius C. and Samuel V. Panno. 1997. *Karst Terrains and Carbonate Rocks of Illinois.* Available at http://isgs.illinois.edu/sites/isgs/files/maps/statewide/imap8.pdf.

Wood Group Mustang. 2016. *Dakota Access Pipeline, Illinois and Kaskaskia River HDD Crossing for Dakota Access, LLC*. February 10, 2016.

MITIGATED FINDING OF NO SIGNIFICANT IMPACT

DAKOTA ACCESS PIPELINE PROJECT – SECTION 408
CROSSINGS OF FEDERAL PROJECTS AND FLOWAGE EASEMENTS
PIKE, MORGAN, SCOTT, AND FAYETTE COUNTIES, ILLINOIS

I. Introduction: I have reviewed and evaluated the documents concerning the proposed crossings of USACE – St. Louis District projects and flowage easements by a 30" crude oil pipeline to be constructed by the proponent, Dakota Access, LLC. The Dakota Access Pipeline (DAPL) Project crossings of lands containing projects funded or authorized by the federal government or crossing of lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers (USACE) – St. Louis District) would require permissions from USACE – St. Louis District, which are the federal actions associated with the EA, dated August 2016. This authority derives from 33 U.S.C. Section 408, which requires USACE to give permission before any entity may use, occupy or alter a federal project constructed for navigation or flood control. Therefore, the scope of the EA is limited to the crossings of USACE – St. Louis District projects and flowage easements that would require consent by USACE – St. Louis District, including the proposed crossings of the McGee Creek levee west of the Illinois River (Pike County, IL), the navigation channel of the Illinois River (Pike and Morgan counties, IL), the Coon Run levees east of the Illinois River (specifically Coon Run Northwest levee and Coon Run Southeast levee) (Scott County, IL), and where the proposed pipeline would cross USACE – St. Louis District flowage easements north of Carlyle Lake (Fayette County, IL) approximately 3.5 miles west of the town of Shobonier, IL.

The EA was prepared by Dakota Access for the Proposed Action on behalf of the USACE – St. Louis District as the non-federal representative for compliance with the National Environmental Policy 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, 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 Dakota Access, LLC and the USACE – St. Louis District.

The USACE – St. Louis District adopts this EA and incorporates findings within as part of stipulations to issue a Section 408 permission to cross lands containing projects funded or authorized by the federal government or crossing of lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers to Dakota Access as the Proposed Action. The EA was prepared 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.

II. Proposed Federal Action: The Proposed Action involves evaluating the potential effects of the Dakota Access Pipeline Project (**DAPL Project**), which would cross lands containing projects funded by the federal government or cross lands that have federal government flowage easements under management by the USACE – St. Louis District (**Proposed Action**) near the Illinois River in Pike, Morgan, and Scott counties, Illinois, and near the Kaskaskia River in Fayette County, Illinois. Specifically, this includes the following:

- The proposed DAPL Horizontal Directional Drill (HDD) crossing of the McGee Creek levee and the Illinois River reflects a total crossing length of approximately 6,500 feet, of which approximately 290 feet occurs beneath the McGee Creek levee, and approximately 700 feet occurs beneath Illinois River. The proposed HDD profile under the Illinois River is designed to provide 40 feet of

cover below the bottom of the river. The pipeline would be installed a minimum of 68 below the McGee Creek levee.

- The proposed DAPL HDD crossing of the Coon Run levees reflects a crossing length of approximately 4,341 feet, of which approximately 450 feet occurs beneath the Coon Run levees. The pipeline would be installed a minimum of 57 feet below the Coon Run levees.

- The proposed DAPL pipeline crosses approximately 12,778 feet (2.42 mile) of the USACE – St. Louis District flowage easements north of Carlyle Lake, by both HDD and underground placement via traditional trenching/backfilling operations. The pipeline would be installed a minimum of 36 feet below the Kaskaskia River. In standard conditions, pipeline installed via traditional trench methods within the USACE – St. Louis District flowage easements north of Carlyle Lake would be installed a minimum of 36 inches deep.

- Connected Actions include temporary access roads, construction workspace and HDD stringing areas associated with the Section 408 Proposed Action Areas.

III. Purpose and Need: The DAPL Project purpose is to efficiently and safely transport crude oil from the Bakken and Three Forks production region in northwest North Dakota to a crude oil market hub located near Patoka, Illinois. The Dakota Access Pipeline is being designed to safely carry up to 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.

IV. Alternatives: One modification of existing infrastructure (Alternative 1) and two different transportation (trucking (Alternative 2) and rail (Alternative 3) alternatives were screened out from detailed consideration due to safety, reliability, and infrastructure concerns, all of which would create a greater environmental impact in meeting the purpose and need of the DAPL Project.

Major route alternatives (Alternative 4) were evaluated for the pipeline route as a whole. Datasets utilized during the DAPL 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 use (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. In this way, the preferred alternative was identified through the GIS-based routing program and required minor adjustments based on observed field conditions during onsite surveys and engineering/design.

Four major waterbody crossing methods (Alternative 5) were analyzed: Dam and Pump, Flume, Wet Open-Cut, and Horizontal Directional Drill (HDD). The Dam and Pump, and Flume methods were screened out due to the large volume of water that would need to be diverted. Of the remaining two methods, it was determined that the Open-Cut method would increase environmental impacts and that the HDD method reduced these impacts and was the preferred option to cross major waterbodies.

The two remaining alternatives evaluated include: (1) the No Action Alternative; and (2) Approve the Applicant's Proposed Pipeline Action (crossing the McGee Creek levee for approximately 290 feet, the Illinois River for approximately 700 feet, the Coon Run levees for approximately 450 feet, and crossing federal flowage easement tracts north of Carlyle Lake for approximately 12,778 feet (2.42 miles)) (Requester's Preferred Alternative). More information on the alternative analysis is included in Section 2.0 of the EA.

V. Summary of Environmental Impact: The possible consequences of the No Action and the Requester's Preferred Alternative have been studied for physical, environmental, cultural, social and economic effects. Significant factors evaluated as part of this review include:

a. *Topography and Geology.* Construction of the Proposed Action and Connected Actions would not result in adverse impacts on topography or geology on USACE – St. Louis District project lands or federal flowage easements of the Proposed Action Areas/Connected Action Areas. No unique geologic features would be impacted by any aspect of the HDD installation. No impacts on topography or geology would occur during operations.

b. *Geologic Hazards.* No impacts associated with karst topography, seismic activity, landslides or subsidence within the Proposed Action Areas/Connected Action Areas are anticipated. No areas have a slope that meets or exceeds 25%.

c. *Soils.* There would be no soil disturbance outside of the construction workspace. Permanent impacts on soils would be avoided through the implementation of Best Management Practices (BMP) during construction, restoration, and post-construction revegetation management. Additionally, there would be no conversion of prime farmland soils to non-agricultural use. A summary of Environmental Impact Avoidance and Mitigation Measures can be found in Table 15 of the EA, which is attached also attached to this FONSI, and the Best Management Practices Figures can be found in Appendix B.

d. *Surface Waters.* Direct and indirect impacts would be minimized by using HDD construction methods to install the proposed pipeline underneath the Illinois and Kaskaskia Rivers. At the Illinois River crossing, the pipeline would be installed a minimum of 40 feet below the bottom of the Illinois River and a minimum of 58 feet below the associated unnamed tributary. The pipeline would be installed a minimum of 57 feet below the waterbodies associated with the Coon Run levees of the Illinois River. The pipeline would be installed a minimum of 36 feet below the Kaskaskia River and an associated unnamed tributary. Where perennial waterbodies are open cut, the pipeline will be installed a minimum of 5 feet below the bottom of the channel. The potential for inadvertently released drilling fluids to enter any waterbody from below or from the shoreline is low. No impacts to surface waters are anticipated through the discharge of water used for hydrostatic testing. In the unlikely event of a pipeline leak once in operation, response measures to protect the users of downstream drinking water intakes will be implemented. A draft Facility Response Plan (FRP) can be found in Appendix G.

e. *Ground Waters.* Installation of the pipeline in the Proposed Action Areas/Connected Action Areas would not be expected to result in significant negative impacts on groundwater resources. Construction and dewatering activities are not expected to have a significant effect on regional groundwater flow patterns. 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. Accidental releases from the pipeline system during operations could potentially affect groundwater. In the unlikely event of a spill during pipeline operations, impacts to water resources would be mitigated by following the cleanup procedures and remediation activities described in the Dakota Access' draft FRP. A draft Facility Response Plan (FRP) can be found in Appendix G. By implementing the protective measures set forth in these plans, groundwater contamination due to construction activities is not anticipated.

f. *Wild and Scenic Rivers.* The Proposed Action Areas/Connected Action Areas are located more than 100 miles from the Middle Fork of Vermilion River, the only water body designated as wild and scenic within the state of Illinois. Thus, no impacts to wild and scenic river resources would occur.

g. *Wetlands.* No wetlands would be permanently drained or filled in the Proposed Action Areas/Connected Action Areas. Impacts to many wetland areas would be avoided by HDD. Compensatory mitigation would be provided as required for temporary impacts (5.36 acres of palustrine forested wetland; 13.58 acres of palustrine emergent wetland) and permanent conversion impacts to palustrine forested wetlands (4.11 acres). Impacts to wetlands would be offset through mitigation at the Middle Kaskaskia Mitigation Site, Clinton County, IL. The St. Louis Regulatory Branch is currently reviewing sites for authorization under Nationwide Permit 12 and will determine the appropriate mitigation as a condition of the permit verification. With the implementation of the measures above, impacts to wetlands in the vicinity of the levees and flowage easement crossings would be minimized.

h. *Floodplain.* The USACE – St. Louis District Hydrologic Engineering Section reviewed the proposed pipeline plans for the portion of the DAPL Project in the vicinity of the Illinois and Kaskaskia Rivers for compliance with the requirements of EO 11988 (Floodplain Management). Provided that the site topography is left at its natural ground elevation after construction and all excess material is hauled off site, the Hydrologic Engineering Section concluded that there are no flood risk or floodplain management concerns associated with the Proposed Action.

i. *Levees.* Because of the use of HDD construction methods to install the pipeline well below ground level, construction of the Dakota Access pipeline is not anticipated to have an effect on the operation of the McGee Creek or Coon Run levees.

j. *Vegetation, Agriculture, and Range Resources.* Temporary impacts on land cover would occur in essentially all areas within the construction footprint of the Proposed Action Areas and Connected Actions, the vast majority of which would return to pre-construction land cover upon completion of construction. Impacts on cultivated crops make up the majority of temporary impacts and would return to cultivated crops post-construction. Permanent impacts on land cover would be limited to the permanent ROW and is limited to routine vegetation maintenance including tree removal. Agricultural Mitigation measures can be found in Appendix H.

k. *Wildlife Resources.* Temporary impacts on wildlife could occur during construction due to clearing of vegetation and movement of construction equipment along the ROW. The ROW and temporary workspaces would remain relatively clear of vegetation until restoration is completed. Most mobile wildlife would disperse from the Proposed Action Areas/Connected Action Areas as

construction activities approach. Some less mobile wildlife species such as amphibians, reptiles, and small mammals, have the potential to be directly impacted during clearing and grading activities. Overall, impacts to wildlife in the Proposed Action Areas and Connected Actions areas are anticipated to be very small.

l. *Aquatic Resources*. The HDD setbacks along the Illinois River are approximately 0.55 miles from the west bank and 0.63 miles from the east bank. For the Kaskaskia River, the HDD setbacks are approximately 0.47 miles from the west bank and 0.22 miles from the east bank. These setbacks greatly minimize the risk for sediment transport from the workspace into the rivers during precipitation events. Crossings via HDD carry a low risk of an inadvertent release of drilling mud, composed primarily of bentonite 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. Pipeline installed via HDD would not disturb the aquatic and benthic environments, thus no impacts are anticipated. Impacts to the aquatic environment due to unintended oil releases from the pipeline during operation have the potential to occur. For portions of the pipeline installed beneath the Illinois and Kaskaskia rivers, pipeline depth and wall thickness, installation of remotely operated valves on both sides of the river crossings, and monitoring of the system 24/7 would limit the potential for an inadvertent release into the waterbodies. Additionally, operation 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 USACE – St. Louis District. Thus, operations activities are not anticipated to impact aquatic resources or their habitat. Specific response and mitigation plans can be found in Appendices B, C, and G.

m. *Threatened, Endangered, Candidate, and Proposed Species*. Nine Federally listed and one candidate species have been identified in the USACE – St. Louis District Proposed Action Areas/Connected Action Areas within Pike, Morgan, Scott, and Fayette counties, Illinois. Based on the avoidance and minimization measures, literature reviews, field investigations, and habitat types present in the Proposed Action Areas, USACE – St. Louis District determined that the proposed Action *"may affect, but is not likely to adversely affect"* the Northern Long-eared Bat (*Myotis septentrionalis* – threatened) and the Indiana Bat (*Myotis sodalis* – endangered); and would have *"no effect"* on the Gray Bat (*Myotis grisescens* – endangered), Higgins Eye Pearlymussel (*Lampsilis higginsii* – endangered), Spectaclecase Mussel (*Cumberlandia monodonta* – endangered), Piping Plover (*Charadrius melodus* – endangered), Decurrent False Aster (*Boltonia decurrens* – threatened), Eastern Prairie Fringed Orchid (*Platanthera leucophaea* – threatened), Prairie Bush Clover (*Lespedeza leptostachya* – threatened), and Rattlesnake-Master Borer Moth (*Papaipema eryngii* – candidate).

In a letter from the U.S. Fish and Wildlife Service dated 2 May 2016, the Service concurred with the determination that the project "*may affect, but is not likely to adversely affect*" the Indiana Bat. The Service considers section 7(a)(2) consultation to be completed for this species. Furthermore, the Service found that the Northern Long-Eared Bat is likely to be adversely affected by the DAPL Project, but that this project will not result in prohibited incidental take, and its effects are covered by the Programmatic Biological Opinion dated 5 January 2016. Thus, no additional consultation is needed for the Northern Long-Eared Bat unless: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an

extent not considered in the consultation; (2) the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the consultation; or (3) a new species is listed or critical habitat is designated that may be affected by this project. The Biological Assessment response letter from the USFWS can be found in Appendix K.

n. *Bald Eagles*. If Bald eagles are found nesting in large trees in or near the project area, the proponent has agreed to follow the National Bald Eagle Management Guidelines during construction to avoid and minimize any project-related impacts to this bird.

o. *Land Use*. The Proposed Action 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. Temporary impacts on nearby residences could include inconvenience caused by traffic congestion associated with the transport of equipment, materials, and construction workers. Once in operation, a permanent 50-foot ROW would be maintained, except at segments of the ROW above the HDD profile and farmed tracts, which would be maintained by clearing woody vegetation over only a 30 foot corridor.

p. *Recreation*. The recreational enjoyment of wildlife (such as hunting, fishing or bird watching) may be temporarily affected by construction activities, depending on season and location. However, this effect would be short-term and limited to construction only. No impacts to areas of special interests such as the Meredosia National Wildlife Refuge, Carlyle Lake State Fish and Wildlife Area, or Illinois Natural Areas Inventory Sites would occur as a result of the construction or operation of the Proposed Action.

q. *Cultural and Historic Resources*. Phase I archaeological survey and deep testing within the Proposed Action and Connected Action Areas in Illinois was undertaken between December of 2014 and August of 2015. Six prehistoric sites were identified within these areas. Three of the sites would be crossed by HDD, with the pipeline passing deeply below each site; thus no archaeological deposits would be impacted. The forth site was not eligible. The fifth site was recommended as not eligible and IHPA concurred in a letter dated 3 March 2016. The final site would only be crossed by a construction-matted travel lane that would be used to access the east side of the Coon Run levees HDD workspace area. Deep testing of this site found no evidence for deeply buried sites or buried landforms suitable for the preservation of prehistoric cultural horizons. No further work is recommended for the USACE – St. Louis District projects or flowage easements traversed by the Proposed Action in Illinois. Additionally, correspondence occurred between Mr. John M. Fowler, Executive Director of the Advisory Council on Historic Preservation and Ms. Jo-Ellen Darcy, Assistant Secretary of the Army (Civil Works). In conclusion, no properties considered to be eligible, or potentially eligible for listing in the National Register of Historic Places would be adversely impacted by the Proposed Action or Connected Actions. Coordination letters can be found in Appendix K.

r. *Native American Consultations*. The USACE initiated formal consultation with all tribes (over 70) for the DAPL pipeline on 3 September 2015. Additionally, the 29 tribes the St. Louis District consults with were sent letters dated 22 January 2016 and 2 March 2016 requesting that they notify the St. Louis District of any concerns. An agency/entity consultation list can be found in Table 13 of the EA. At the proposed Illinois River and McGee Creek levee crossing, no Tribe has

indicated that they would like to enter into consultation or monitor the Proposed Action Areas/Connected Action Areas. At the Coon River levees Proposed Action Areas/Connected Action Areas, the Osage Nation stated verbally they would not enter into consultation on a site located in vicinity, but would like to monitor the area during the placement of the pipe. At the Proposed Action Areas/Connected Action Areas at the Carlyle Lake flowage easement, the Osage Tribe stated verbally they would not enter into consultation on a site located in vicinity. Tribal consultation is complete for the Section 408 Proposed Action Areas/Connected Action Areas. The Osage Nation will be informed when the HDD is occurring at the single site they desire to monitor in the Coon River levees Proposed Action Areas/Connected Action Areas, and arrangements will be made for them to send a representative. Additionally, correspondence occurred between Mr. John M. Fowler, Executive Director of the Advisory Council on Historic Preservation and Ms. Jo-Ellen Darcy, Assistant Secretary of the Army (Civil Works). Coordination letters can be found in Appendix K.

s. *Social and Economic Conditions*. Counties within the Proposed Action Areas/Connected Action Areas could experience short-term temporary beneficial effects to the local economy through induced spending from construction employees working on the crossings. No residential homes or farms would be relocated as a result of the Proposed Action. In compliance with Executive Order 13045, Protection of Children from Environmental Health and Safety Risks, the pipeline crossings would not be near any facilities where children are present and would not constitute an environmental health and safety risk that may disproportionately affect children.

t. *Environmental Justice*. The Proposed Action Areas/Connected Action Areas have minority populations that are less than, equal too, or slightly higher (1.5 to 2.5 percent higher) than the minority populations in the respective counties. The Proposed Action Areas/Connected Action Areas have poverty rates less than, equal too, or slightly higher (2 percentage points) than poverty rates in the State as a whole. Thus, the census tracts crossed by the Proposed Action do not include minority or low income populations that are "meaningfully greater" than the minority or low income populations in the general population, and the Proposed Action would not disproportionately affect identified minority or low-income populations.

u. *Hazardous, Toxic, and Radioactive Wastes*. Presently, there are no recognized Radiation Information Database, Brownfields, or Superfund sites within one mile of the corridor in Fayette, Morgan, Pike, or Scott Counties. However, on the south side of Meredosia and about 3,000 feet from the closest pipeline route, Celanese Ltd., Ameren Meredosia Power Station, and the Meredosia Terminal are on the Toxic Release Inventory and registered under the Toxic Substances Control Act as handling regulated chemicals. No operating sensitive receptors, such as schools or hospitals, are reported within at least one mile of the Proposed Action Areas/Connected Action Areas. Within the Proposed Action Areas/Connected Action Areas, there is potential for temporary impacts to public safety from hazardous material use. Other hazards to worker safety may also exist along the Proposed Action corridor, but do not pose a significant impact. Any hazardous materials discovered, generated, or used during construction would be managed and disposed of in accordance with the DAPL Project's SPCC plan and Unanticipated Discovery Plan as well as the applicable local, tribal, state, and federal regulations. Plans can be found in Appendices B and I.

v. *Reliability and Safety*. Construction activities could present safety risks to those performing activities, residents and other pedestrians in the neighborhood. Given the low population density of the area, safety risks during construction would be limited to workers involved with the Proposed Action. 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. Dakota Access would utilize a supervisory control and data acquisition (SCADA) system to provide constant remote oversight of the pipeline facilities. Throughout operation of the DAPL Project, the Operator and qualified contractors would maintain emergency response equipment and personnel at strategic points along the pipeline route. In the unlikely event of a leak during operations of the pipeline, the Operator would implement the response measures described in the Facility Response Plan. Emergency equipment would be available to allow personnel to respond safely and quickly to emergency situations. Following incident command protocols, the Operator would work in unison to cooperate with and assist fire, police and other first responders when implementing actions to protect personnel, public safety and the environment. Specific response and mitigation plans can be found in Appendices B, C, and G.

w. *Air Quality*. Within the Proposed Action Areas/Connected Action Areas, no long-term impacts to air quality would occur; the proposed pipeline would not emit any criteria air pollutants and is entirely underground. Construction of the HDD across the McGee Creek levee, the Illinois River, and the Coon Run levees is likely to take eight to twelve weeks to complete. Conventional pipeline construction across the federal flowage easements would take approximately one month to complete. 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.

x. *Noise*. 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. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime only). Once constructed and in-service, normal pipeline operations are not audible.

y. *Climate Change*. During construction, emissions from fuel-burning internal combustion engines (e.g., transportation trucks, heavy equipment, drill rigs, etc.) would emit Green House Gases (GHG). To reduce the emission of GHG, 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 local or regional climate long-term. The Proposed Action has no emission sources during operation of the DAPL Project in the Proposed Action Areas/Connected Action Areas and would therefore not emit GHG.

Dakota Access does not extract or produce any product, and would only provide a pipeline that is a safe and efficient logistical link between supply and demand for oil and petroleum products. A pipeline is a more efficient way to ship the supply to the demand because they ship only the product itself, where trains, trucks, and ships also require energy to move the heavy container. Not only the transportation via tanks, trucks and ships generate GHG emissions, but the loading

and unloading of the product could also emit GHG emissions depending on the product loaded/unloaded and controls in place. More broadly, shipping oil from North Dakota to domestic refineries also requires much less total shipping distance than importing the oil from the Middle East, Africa, or South America (or even Alaska).

z. *Cumulative Impacts*. For the proposed action, key resources of concern include impacts to geology and soils, water and aquatic life resources, vegetation, agriculture, and range resources, federally threatened and endangered species, wildlife resources, land use and recreation, cultural and historical resources and Native American consultations, social and economic conditions, transportation and traffic, and air quality and noise. Based on the evaluations of past, present, and future actions that could have a cumulative impact on resources affected by the Proposed Action, it was determined that a slight adverse effect to vegetation resources and a beneficial effect to social and economic conditions would occur if permission is given for the Proposed Action. Other resources considered and listed in Table 12 of the EA are anticipated to have no incremental cumulative impact when evaluated with past, present, and future actions.

VI. Mitigation Measures: Impacts to the environment would be temporary and not significant as a result of avoiding, minimizing and mitigating any potential impacts. The majority of potential impacts would be mitigated by HDD technology, which would install the pipeline beneath resources without surface disturbance and allow pipeline construction to proceed with the least amount of impacts possible. Additional mitigation measures within the Stormwater Pollution Prevention Plan, Spill Prevention, Control, and Countermeasure Plan, HDD Construction Plan, HDD Contingency Plan, Unanticipated Cultural Resources Discovery Plan and Geographical Response Plans will be followed to prevent environmental and cultural resource impacts. Impacts to land use and vegetation would be temporary and land would be allowed to return to current land use once construction is complete. No long term impacts are anticipated to any resources. Social and noise impacts to rural residents in the general vicinity would be minimal as construction would be completed during daylight hours and the locations are remote from most populated areas. See Section 6.0 in the EA for more details on best management practices and mitigation measures the applicant has committed to adhere to for this Proposed Action.

VII. Environmental Compliance. Compliance with Section 404 of the Clean Water Act, and Section 10 of the Rivers and Harbors Act will be achieved with verification of the applicant's Pre-Construction Notifications (PCNs) for Nationwide Permit #12 for Utility Lines at separate and distant waterbody crossings. Compliance with Section 401 for Illinois, will be achieved by including the required conditions from the Illinois EPA in the permit verification letter for the applicant's PCNs for Nationwide Permit #12 for Utility Lines. Compliance with Section 106 of the National Historic Preservation Act has been achieved by coordination with the Illinois State Historic Preservation Office, which provided concurrence letters dated 21 and 28 March 2016. The U.S. Fish and Wildlife Service has reviewed the Biological Assessment and provided a response letter to fulfill compliance with the Endangered Species Act. The public notice provided the USFWS with the opportunity to provide recommendations under the Fish and Wildlife Coordination Act concerning the Proposed Action. No recommendations were received from the USFWS by the expiration date of the public notice (5 February 2016), thus the USACE is deemed to be in full compliance with the Fish and Wildlife Coordination Act. Furthermore, Dakota Access has consulted with the USFWS for technical assistance to determine appropriate measures necessary to minimize and avoid impacts to wildlife resources. The Illinois Department of Natural Resources provided an Authorization for Incidental take and Implementation Agreement to Dakota Access Pipeline, LLC, signed 25 February 2016. Compliance with the National Environmental Policy Act will be achieved with the signing of this document.

The project compliance with all other applicable laws and regulations is documented in Table 14 of the EA.

VIII. Coordination and Public Review

On 5 January 2016, the St. Louis District posted a Public Notice on the USACE – St. Louis District website describing the proposed project in adequate detail, and disclosing that the agency would prepare NEPA documentation. Through the Public Notice, the District solicited meaningful comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of the proposed activity. Comments were accepted from 5 January 2016 through 5 February 5 2016. A copy of this Public Notice is provided in Appendix J. In addition to the Public Notice, the USACE consulted with the Illinois Historic Preservation Agency, the USFWS, and the Illinois Department of Natural Resources to solicit comments for the Proposed Action within the USACE Section 408 Proposed Action Areas/Connected Action Areas (see Appendix K). The USACE also conducted tribal consultations (see Appendix K). Table 13 of the EA includes a listing of individuals and agencies consulted during preparation of the EA regardless of whether a response was received.

The USACE – St. Louis District fully considered comments received and made additional clarifications within the EA as necessary. No significant comments remain unresolved. More information on how the comments received during the review process were addressed is presented in Appendix J of the EA. Because all comments have been addressed, no additional NEPA compliance actions are required prior to the USACE – St. Louis District making a decision to complete federal actions authorizing work within the scope of analysis presented within the EA. The Requester's Preferred Alternative has been designed in such a way as to minimize impacts to sensitive resources and the applicant has agreed to comply with all applicable federal, state, and local laws and regulations.

IX. Conclusion. Based on the disclosure of the impacts associated with the Proposed Action contained within the draft EA, it is my determination that providing permission to cross lands containing projects funded by the federal government or lands that have federal government flowage easements under management by the U.S. Army Corps of Engineers – St. Louis District for constructing portions of the proposed Dakota Access Pipeline Project would not constitute a major federal action that would significantly affect the quality of the human environment. I have determined that preparation of an Environmental Impact Statement is not required.

3 February 2016

Date

Anthony P. Mitchell
Colonel, U.S. Army
District Commander

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
Geology and Soils	To protect the terrain of the Proposed Action Areas/Connected Action Areas, 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 F).
	Dakota Access, in accordance with Illinois One-Call (Julie), 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 HDDs crossing the Illinois River and McGee Creek Levee, the Illinois Coon Run Levees, and the Kaskaskia River to facilitate engineering and design, including selection of appropriate materials and construction methods to limit any environmental impacts.
	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 I) 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 Illinois State Historic Preservation Officer. 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 AIMP 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	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 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 SWPPP (Appendix B).
Water Resources	Impacts to the Illinois and Kaskaskia Rivers would be minimized by using HDD construction methods to install the proposed pipeline underneath these rivers.
	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 through beneficial use by land farming.
	Dakota Access would conduct all HDD work according to the HDD Construction Plan that it has prepared, and implement the HDD Contingency Plan in the event of an inadvertent release.
	Water withdrawal from the Illinois or Kaskaskia Rivers would comply with all applicable permit conditions and regulations. Temporary water pumps would be placed within secondary containment 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 would be conducted in accordance with applicable permits.
	Discharged hydrostatic test water would not contain additives.
	Where appropriate, water would be discharged into an energy dissipation and/or filtering device as described in Dakota Access' SWPPP (Appendix B) to remove sediment and to reduce the erosive energy of the discharge.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	Fuel and all other hazardous materials would be stored in accordance with the requirements of Dakota Access' SPCC and SWPPP. These documents also describe response, containment, and cleanup measures.
	Els would monitor compliance with applicable waterbody protection requirements during construction of the facilities. The DAPL Project SWPPP (Appendix B) describes 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.
	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 DAPL Project specific SPCCs prepared by the contractor and in Dakota Access' SPCC Plan (Appendix B).
	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 to minimize impacts to forested wetlands, reducing the normal construction workspace from 125 feet to 85 feet wide.
	Unavoidable impacts to forest wetlands will be offset through mitigation. Dakota Access will mitigate temporary impacts to forested wetlands at a mitigation to impact ratio of 1.5:1 and permanent conversion to forested wetlands at mitigation to impact ratio of 2:1.
	Dakota Access is in the process of obtaining verification for use of Nationwide Permit 12 for the crossing of the Illinois River (Section 10 authorization) and for crossing of wetlands and streams (Section 404) within the Carlyle Lake flowage easements.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	The DAPL Project SWPPP and SPCC 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 SPCC also specifies that equipment must be refueled at least 100 feet from waterbodies unless, due to site-specific conditions, there is no practical alternative. In that case, the contractor must implement site-specific protective measures and containment procedures described in the SPCC. 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.
	The DAPL 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 Illinois River and Carlyle Lake flowage easements crossings for isolation in the event of an emergency shutdown.
Vegetation, Agriculture, and Range Resources	Within areas disturbed by construction of the DAPL Project, and not being actively cultivated, including the Carlyle lake flowage easements, 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.
	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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	At stream approaches, the contractor would leave a minimum of a 10-foot buffer (up to 30-foot depending on site conditions at the time of clearing) 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.
	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.
Wildlife Resources	In the unlikely event that a listed species is encountered within the Proposed Action Area during construction, construction activities would stop and the USFWS would be contacted.
	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 during construction, construction activities would stop and the USFWS would be contacted.
	Potential roosting habitat for the Indiana Bat and Northern Long-Eared Bat would be removed in the wintertime (between October 1 and March 31) to avoid adverse impacts to these species
Aquatic Resources	A successfully completed HDD crossing would avoid aquatic resource impacts to the Illinois and Kaskaskia rivers since the pipeline would be installed without disturbing the aquatic and benthic environments.
	HDD operations conducted for the Illinois River and McGee Creek Levee, Coon Run Levees, and Kaskaskia River 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 Illinois and Kaskaskia 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 Illinois River and Kaskaskia 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 Illinois and Kaskaskia Rivers would be avoided or minimized by placing the pump within a secondary containment structure.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	For portions of the pipeline installed by HDD, 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 Illinois or Kaskaskia Rivers.
	Adherence to the Geographic Response Plans for Illinois River, Coon Run Levee, and Kaskaskia River would minimize potential impacts on aquatic wildlife from potential spills during the operation of the pipeline.
	Conduct emergency response drills/exercises in accordance with the National Preparedness for Response Exercise Program (PREP) consisting of table top exercises and equipment deployment drills. Dakota Access is committed to conducting a worst case discharge full scale exercise at either the Illinois or Kaskaskia River once every 6 years and will include both open water and ice response. Dakota Access will alternate the location and type of exercise.
	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 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 farming 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.

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
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 Proposed Action Area. Based on the result of these efforts, no properties considered to be eligible, or potentially eligible for listing in the National Register of Historic Places (NRHP) would be adversely impacted by the Proposed Action or Connected Action.
	Impacts to a potentially NRHP-eligible site, 11ST582, would be avoided via HDD.
	Impacts to a potentially NRHP eligible site, 11ST192, would be avoided by crossing a portion of the site with a timber-mat travel lane in an active agricultural field. No subsurface disturbance within this site would be allowed in order to preserve any buried cultural deposits that may occur at this location.
	Dakota Access' UDP was developed (Appendix I) 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 I) 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).

Table 15 Summary of Environmental Impact Avoidance and Mitigation Measures	
Resource	**Environmental Avoidance/Mitigation Measures**
	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 DAPL 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 DAPL Project facilities.
	A Computational Pipeline Monitoring System (CPM) would be utilized to monitor the pipeline for leaks.
	LeakWarn is being tailored to the DAPL 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 construction to the minimum amount necessary to complete the Proposed Action. Noisy construction activities would typically be limited to the least noise-sensitive times of day (daytime).