Dakota Access Pipeline Lake Oahe Crossing Project Draft Environmental Impact Statement

Volume I

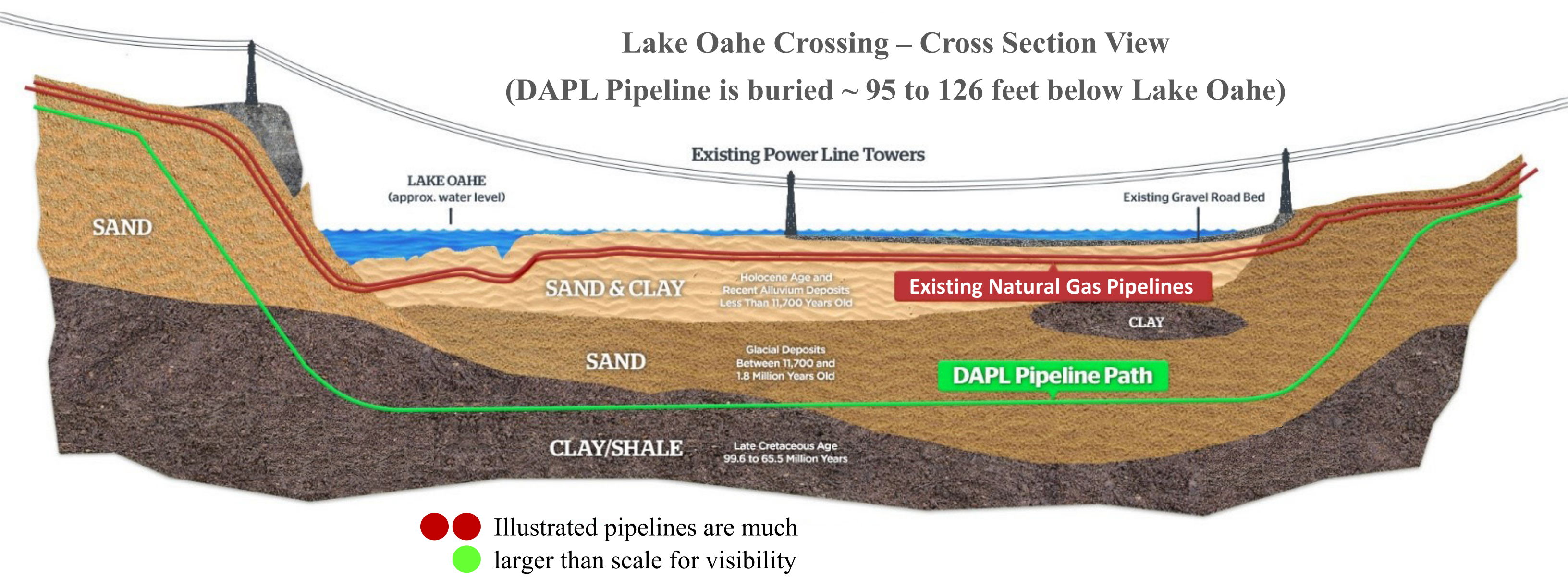
September 2023

Lead Agency:

U.S. Army Corps of Engineers (Omaha District)

Cooperating Agencies:

Cheyenne River Sioux Tribe
State of North Dakota
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service



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Cover Sheet

Environmental Impact Statement

Dakota Access Pipeline Lake Oahe Crossing Project

Lead Agency: U.S. Army Corps of Engineers (USACE) – Omaha District

Cooperating Agencies: Cheyenne River Sioux Tribe, State of North Dakota, U.S. Environmental Protection Agency, and U.S. Fish and Wildlife Service

Location: Morton and Emmons counties, North Dakota

EIS Contact for Comments and Additional Information:

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Draft EIS Comments Must be Received by: November 13, 2023

Comments on the Draft EIS can be Provided via the Following Options:

1) Mail a paper copy of comments to:
   U.S. Army Corps of Engineers
   Attn: Brent Cossette
   CENWO-PMA-C (DAPL DEIS)
   1616 Capitol Avenue
   Omaha, NE 68102
2) Email comments to: nwo-dapl-eis@usace.army.mil
3) Participate and provide comments verbally at one of the scheduled public meetings: Two Tribal meetings are scheduled for November 1 and 2, 2023 from 9:00 a.m. to 12:00 p.m. and two public meetings are scheduled for November 1 and 2, 2023 from 6:00 p.m. to 9:00 p.m. One virtual Tribal meeting is scheduled for November 8, 2023, from 1:00 p.m. to 4:00 p.m.

Abstract: Dakota Access, LLC (Dakota Access) previously constructed over 1,100 miles of crude oil pipeline to provide transportation service from points of origin in the Bakken and Three Forks plays in North Dakota to a terminus in Patoka, Illinois, known as the Dakota Access Pipeline Project (DAPL Project). A portion of the DAPL Project included crossing federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota (the Project), requiring an easement under the Mineral Leasing Act. The USACE previously evaluated this crossing through development of an Environmental Assessment (EA) issued on July 25, 2016. On February 8, 2017, the USACE granted an easement with conditions for the crossing. Operation of the pipeline began on June 1, 2017. However, on March 25, 2020, the District Court for the District of Columbia ordered the USACE to prepare an Environmental Impact Statement (EIS) for this portion of the pipeline because the pipeline's "effects on the quality of the human environment are likely to be highly controversial."

The Project was constructed using the horizontal directional drilling method. The Project area includes the crossing at Lake Oahe and the portions of pipeline that extend approximately 911 feet east of the lake's east bank and 1,138 feet west of the lake's west bank. Approximately 1,103 feet (0.21 mile) of the pipeline passes beneath surfaces designated as USACE federal lands. The drilling method used allowed

the pipeline to be buried between approximately 95 and 126 feet below the bottom of Lake Oahe. The crossing location is approximately 0.55 mile north of the Standing Rock Sioux Reservation.

The Draft EIS evaluates five alternatives: 1) Denying the easement and abandoning the pipeline by removal (No Action); 2) Denying the easement and abandoning the pipeline in place (No Action); 3) Granting the easement with the same conditions as the previous easement (Applicant Proposed Action); 4) Granting the easement with additional easement conditions; and 5) Constructing and operating a pipeline reroute north of Bismarck, North Dakota.

Reviewers should provide the USACE with their comments by November 13, 2023. This will enable the USACE and cooperating agencies to analyze and respond to comments and use the information acquired in the preparation of the Final Environmental Impact Statement. Comments on the Draft EIS should be specific and should address the adequacy of the Draft EIS and the merits of the alternatives discussed.

EXECUTIVE SUMMARY

ES.1. INTRODUCTION AND BACKGROUND

The Dakota Access Pipeline (DAPL) is a crude oil pipeline that began operation in 2017. It is approximately 1,100 miles long and transports crude oil from the Bakken and Three Forks plays in North Dakota to a terminus in Patoka, Illinois. Approximately 5,420 feet (1.02 miles) of DAPL are buried in the ground below the bed of the Missouri River at Lake Oahe, which is a U.S. Army Corps of Engineers (USACE) reservoir. Because the USACE is responsible for the management of Lake Oahe, the USACE has jurisdiction over rights-of-way through and under Lake Oahe for oil and gas pipelines under the Mineral Leasing Act (MLA), 30 United States Code (USC) § 185 (the Project). This Environmental Impact Statement (EIS) is being prepared to guide the USACE in its decision whether or not to grant an easement allowing DAPL to cross Lake Oahe under the MLA. The location of this crossing is shown on Figure ES-1.

Prior to the construction of the DAPL crossing under Lake Oahe, the USACE evaluated this crossing under the National Environmental Policy Act (NEPA) through development of an Environmental Assessment (EA) issued on July 25, 2016. Concurrent with issuance of the 2016 EA, on July 25, 2016, USACE granted permission under Section 14 of the Rivers and Harbors Act of 1899 (408 permission) to Dakota Access, LLC (Dakota Access) for a crude oil pipeline crossing under Lake Oahe, as supported by a Finding of No Significant Impact based on the 2016 EA (USACE, 2016). On February 8, 2017, the USACE granted an easement with conditions under the MLA for the crossing. The easement allowed for the installation, construction, operation, maintenance, repair, replacement, and termination of a 30-inch diameter horizontal directional drill (HDD) buried oil pipeline for the purpose of transporting crude oil, and related facilities, at or under Lake Oahe Project in North Dakota, with a 50-foot width plus the ground occupied by the pipeline and related facilities. Operation of the pipeline began on June 1, 2017.

On March 25, 2020, the District Court for the District of Columbia ordered the USACE to prepare an EIS for this portion of the pipeline because the pipeline's "effects on the quality of the human environment are likely to be highly controversial." As a result, to evaluate granting of an easement under the MLA and meet NEPA requirements, the USACE has prepared this EIS in accordance with the Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] Parts 1500–1508, 1992), USACE Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements.

On July 6, 2020, the District Court vacated the easement for the Lake Oahe crossing and ordered the Dakota Access Pipeline Project (DAPL Project) operation shut down by August 5, 2020. However, on August 5, 2020, the U.S. Court of Appeals for the District of Columbia Circuit ordered a stay of the injunction that ordered Dakota Access to shut down the DAPL Project, although the vacatur of the easement remains. The District Court case was dismissed on June 22, 2021.

North Dakota

Project Centerline
Standing Rock Sioux Tribe Reservation
Workspace
USACE Federal Lands

1:32,000

0 1,000 2,000 Feet

Figure ES-1: Applicant Proposed Action Area
Dakota Access Pipeline Lake Oahe Crossing Project
Morton County and
Emmons County, North Dakota

ERM

REVISED: 07/12/2021 | SCALE: 1:32,000

ES.1.1. Applicant Proposed Action—Granting an Easement at Lake Oahe

When an agency is responding to an application from a non-federal entity for a permit, the proposed action is often what the applicant proposes or is seeking permission to do. The agency will evaluate the applicant's proposed action along with an array of alternatives to the proposed action before deciding on a preferred alternative.[1] The preferred alternative "is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors." An agency may decide that an alternative other than the proposed action is the preferred alternative.

In this EIS, the USACE is responding to an application for an MLA easement to cross under Lake Oahe from Dakota Access, and the proposed action is based on Dakota Access' proposal and referred to as the "Applicant Proposed Action." The USACE has not selected a preferred alternative in this Draft EIS and will make a selection in the Final EIS upon consideration of all public and agency comments.

The Applicant Proposed Action includes the USACE granting the requested easement with the same conditions as the vacated easement and includes continued operation of the portion of the DAPL Project that crosses Lake Oahe (the Project) and land that exists on either side of the lake, some of which is designated as USACE federal land. The USACE federal lands are real estate interests, specifically, the fee title lands that the USACE owns and manages.

The Applicant Proposed Action is located at the border between Morton and Emmons counties, approximately 0.55 mile north of the northern exterior boundary of the Standing Rock Sioux Tribe (SRST) reservation and does not cross the reservation. The specific area impacted by the Applicant Proposed Action is defined as the pipeline crossing at Lake Oahe and the portions of pipeline that extend approximately 911 feet east of the lake's east bank and approximately 1,138 feet west of the lake's west bank. Approximately 1,103 feet (0.21 mile) of the pipeline in the Project Area passes beneath surfaces designated as USACE federal lands.

Construction workspace areas were used in support of the HDD installation of the pipeline. These construction workspace areas are included as part of the Applicant Proposed Action because they were directly connected to the ability for Dakota Access to complete the Lake Oahe crossing. Connected Actions associated with the Applicant Proposed Action are also included in this evaluation and include the permanent easement on private lands within the vicinity of the Lake Oahe crossing. The HDD entry and exit point workspaces and stringing area and associated easements were located on private land outside of the federal lands and are considered Connected Actions in this analysis.

ES.1.2. Purpose and Need

Because the Project crosses Lake Oahe and the associated USACE-managed real estate, the Project requires an easement under the MLA. The USACE is responsible for evaluating applications and for granting an easement under the MLA at Lake Oahe. Because an easement had previously been granted

[1] *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulation* (CEQ, 1981)

and the pipeline constructed, the USACE must consider whether the pipeline should remain across its property or be removed. As such, the USACE is the lead federal agency for the preparation of an EIS for this Project in compliance with the requirements of NEPA and the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR § 1500–1508).

The purpose and need for this EIS is to evaluate whether a new easement can be issued under the MLA for the DAPL Project to cross USACE-managed federal lands at Lake Oahe. This evaluation considers the Project purpose of the Applicant Proposed Action to be the purpose of the DAPL Project (to transport up to 1,100,000 barrels per day (bpd) from the Bakken and Three Forks production region in North Dakota to a crude oil market hub located near Patoka, Illinois, and ultimately to refineries located in the Midwest and the Gulf Coast), but the analysis is limited to effects of allowing the pipeline to cross federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota (the Project).

ES.1.3. AUTHORITY AND SCOPE OF EIS

As the lead federal agency, the USACE published a Notice of Intent (NOI) in the Federal Register [85 Fed. Reg. 176 (September 10, 2020)] to advise the public that the USACE will prepare an EIS and open the public scoping period to identify issues and reasonable alternatives to the Applicant Proposed Action. This EIS has been prepared in accordance with the CEQ Regulations (40 CFR Parts 1500–1508, 1992), USACE Regulation ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements. The Cheyenne River Sioux Tribe (CRST), State of North Dakota, U.S. Fish and Wildlife Service (USFWS), and U.S. Environmental Protection Agency (EPA) participated as cooperating agencies in preparation of the draft EIS. The Oglala Sioux Tribe participated as a cooperating agency for 6 months (from March 2021 through September 2021). The SRST participated as a cooperating agency for 10 months (from March 2021 through January 2022). A cooperating agency is an agency that provides input into specific resource areas because it has jurisdiction by law or has special expertise with respect to environmental resources issues associated with a project (40 CFR § 1501.7).

ES.1.4. SUMMARY OF PUBLIC/TRIBAL OUTREACH AND COORDINATION

On September 10, 2020, the USACE published an NOI to prepare an EIS in the Federal Register. The USACE issued a series of notices in the Federal Register intended to keep the public informed about the EIS public scoping process. The notices were also provided to the public through the USACE's Project website. In addition to the NOI, scoping coordination letters were sent to public entities, including individuals, agencies, Tribes, and others that may have an interest, or previously had expressed interest, in the Project. The coordination letters were sent in September 2020 inviting participation in the public scoping process.

Due to the COVID-19 pandemic, the Omaha District conducted two virtual public meetings on October 15, 2020, and October 16, 2020, respectively. The public scoping period was open from September 10, 2020, to October 26, 2020. Many interested parties requested an extension of the scoping period; therefore, the scoping period was extended from October 23, 2020, to November 26, 2020. In addition to the public scoping meetings, scoping input was accepted via mail, email, and phone message.

A total of approximately 49,200 comments were received during scoping through a variety of methods (email, mail, voicemail, Facebook chat, etc.). Members of the public, Tribes, local and state governmental agencies, non-governmental organizations, and other stakeholders, all provided comments during the aforementioned period. The overwhelming majority of input received focused on environmental justice, along with the purpose and need of the Project, reliability and safety, and water quality. All input will be included in the Administrative Record for this Project.

The USACE also sought input from the Tribes who live near the Project Area through multiple avenues, including scoping meetings and comments, participation as cooperating agencies in development of the EIS to provide technical support and knowledge in their areas of special expertise, and through government-to-government consultation (see Section 1.5 and Table 1.5-1 in Chapter 1, Introduction and Background, of the EIS). All Tribes in the USACE's *Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act* (USACE, 2004; Programmatic Agreement) were also provided a preliminary version of the Draft EIS prior to publication to gather additional Tribal input.

ES.2. ALTERNATIVES

As required by NEPA and the agency's NEPA implementing regulations, the USACE developed five alternatives to the Project for evaluation in this EIS. The environmentally preferable alternative will be identified as part of the Record of Decision in accordance with NEPA implementing regulations.

ES.2.1. NO ACTION ALTERNATIVES

The CEQ regulations for implementing NEPA require the evaluation of the No Action Alternative (40 CFR § 1502.14(c) 2012). In general, any No Action Alternative is unlikely to meet a project's purpose and need but should be evaluated to inform decision making and allow an agency to understand the effects of an action in consideration of meeting a purpose and need.

Under the No Action Alternative, the USACE would not grant an easement to cross federal property at Lake Oahe, which results in the requirement to abandon the existing pipeline either by removal or in -place. Each type of abandonment is considered as a separate No Action Alternative. The denial of the easement and removal of the pipeline segment beneath Lake Oahe would likely result in a pipeline reroute. Therefore, the impacts of Alternatives 1 and 2 are considered throughout the EIS in connection with a possible reroute under Alternative 5.

ES.2.1.1. Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required

Alternative 1 is a No Action Alternative where the USACE would not grant an easement to cross the federal property at Lake Oahe and would require restoration of the USACE -administered federal lands to pre-pipeline conditions. Alternative 1 includes the removal of approximately 7,500 feet of the 30-inch diameter pipeline within the Project Area, with approximately 6,400 linear feet buried approximately 95 to 126 feet below Lake Oahe. Water depths within Lake Oahe range from approximately 3 feet at the shallowest point to 30 feet at the deepest point within the footprint of the pipeline crossing. Conceptual excavation would require removal of 12,300,000 cubic yards of soil within an approximately 77-acre footprint, with an additional 1,400 acres onshore for temporary spoil storage. Due to the extent of the excavation required, abandonment by removal is anticipated to take from 6 to 20 years or more for completion.

ES.2.1.2. Alternative 2: Easement is Not Granted and No Further Action

Alternative 2 is a No Action Alternative where the USACE would not grant an easement to cross federal property at Lake Oahe and the 7,500 feet of pipeline within the Project Area would be abandoned in place. This segment would be abandoned in place according to 49 CFR § 195.402(10) requirements, including purging the pipeline segment of oil and permanently sealing. Abandonment activities would likely be completed in 1 year.

ES.2.2. ACTION ALTERNATIVES

ES.2.2.1. Alternative 3: Grant Requested Easement Consistent with Vacated Easement Conditions (Applicant Proposed Action)

Under Alternative 3, the USACE would grant the requested easement to cross federal property consistent with conditions of the now vacated easement issued on February 8, 2017, the only difference being that the volume of oil allowed under the easement would increase to 1.1 million bpd. The vacated easement originally allowed for the transfer of 570,000 bpd. The easement would allow for the operation, maintenance, repair, replacement, and termination of the existing 30-inch diameter buried pipeline under Lake Oahe, which would continue to transport crude oil from North Dakota to Illinois. The easement would cover a 50-foot width plus the ground occupied by the pipeline and related facilities. Thirty-six conditions were included in the previous easement language (see Appendix D, Alternative 3 Easement Special Conditions). Dakota Access currently operates the existing pipeline under these 36 easement conditions. This alternative would not require any additional construction activities, and Dakota Access would continue to implement monitoring plans, routine inspections, and maintenance in compliance with state and federal regulations. Since the pipeline has been constructed and placed into operation at the time of completion of this EIS, Alternative 3 examines the known impacts of past construction activities under the "Current Affected Environment" subsection for each resource within Chapter 3, Affected Environment, Impacts, and Mitigation.

ES.2.2.2. Alternative 4: Grant Requested Easement with Additional Conditions

Alternative 4 is similar to Alternative 3 (the Applicant Proposed Action) as the USACE would grant the requested easement allowing for the operation, maintenance, repair, replacement, and termination of the DAPL Project; however, the easement would be granted with additional conditions and modifications. Coordination with cooperating agencies and Tribes, review of the original easement conditions, and additional analysis developed during this EIS considering scoping comments and commitments made by Dakota Access have contributed to the development of additional conditions beyond those included in the originally granted easement. Additional conditions aim to avoid, minimize, or mitigate potential impacts of a crude oil release. The additional easement conditions would become requirements when added to the easement. The additional conditions are described in detail in Section 2.6.2 and respective resource impact analysis sections throughout Chapter 3; they include, but are not limited to: developing plans for alternative drinking water supply and groundwater monitoring; performing visual surveys, surface water sampling, and sediment and/or benthic macroinvertebrate sampling; conducting fish tissue residue analyses; conforming to bald eagle management guidelines; implementing new leak detection technology; implementing a culturally appropriate food distribution program; and coordinating to undertake systematic subsistence studies.

Similar to Alternative 3, this alternative would not require any construction activities within the Project Area. The additional measures are expected to generally result in increased operational safety of the pipeline and facilitate incident notification and shutdown procedures. Additional on-ground inspections at the crossing would require additional personnel to be on-site on a weekly basis.

ES.2.2.3. Alternative 5: North Bismarck Reroute

If an easement is not granted under Alternative 1 or 2, it is likely that Dakota Access will pursue a pipeline reroute. Alternative 5 presents a reroute of the DAPL Project. The North Bismarck Reroute is one potential reroute Dakota Access may consider, which was initially evaluated in the 2016 EA. For the purposes of this NEPA analysis, it is being used as a proxy to analyze impacts associated with a reroute. As such, it was selected for evaluation in this EIS as a proxy for the reroute, although the exact route that Dakota Access would seek is unknown. This route would require further evaluation and siting by the State of North Dakota, which approved the siting of the pipeline in its current location. This alternative route would be 111 miles long and approximately 50 miles north of the existing Project location. It would begin in Mercer County, North Dakota, where it would connect to customer receipt points and extend southeast through Oliver, Morton, Burleigh, and Emmons counties, crossing the Missouri River approximately 8.5 miles up-river of Bismarck/Mandan and approximately 38.5 miles upstream of the current location. Dakota Access would need to acquire federal, state, and local permits for the approval of this alternative, including a new certificate of corridor compatibility and route permit from the North Dakota Public Service Commission (NDPSC), which could take a minimum of 2 years. Implementation of Alternative 5 would require that the existing pipeline be abandoned; therefore, Alternative 5 results from and requires the implementation of Alternatives 1 or 2 and their associated impacts. Combined impact determinations are provided for each resource.

ES.3. ENVIRONMENTAL CONSEQUENCES

The environmental consequences of the Project on the human environment were analyzed for each of the five alternatives. When considering the environmental consequences, the duration, intensity, and significance of any potential impacts were assessed.

Duration of the impacts are described according to the following four levels: temporary, short-term, long-term, and permanent.

- Temporary impacts generally occur for about 1 year, with the resources returning to preconstruction conditions almost immediately.
- Short-term impacts would occur for 1 to 3 years.
- Long-term impacts would last more than 3 years, although eventually would recover to preconstruction conditions.
- Permanent impacts are defined as activities that modify resources to the extent that they may not return to preconstruction conditions during the life of the Project, such as with the construction of an aboveground facility.

Intensity of the impacts are described according to the following four levels: negligible, minor, moderate, and major:

- Negligible impacts occur when the resource would not be affected in a perceptible way and as of such little consequence as to not require additional consideration or mitigation.
- Minor impacts occur when there would be a barely perceptible impact on the resource; however, the impact would not result in an overall change in resource character or value and the resource can continue to be relied upon for its current use.
- Moderate impacts occur when there would be an indisputably perceptible impact on the resource and an overall change in the resource character or value; however, the resource can continue to be relied upon for its current use.
- Major impacts occur when there would be an indisputably perceptible impact on the resource that would likely result in an overall change in resource character or value and the resource cannot be relied upon for its current use.

An impact would be considered significant if it would result in a permanent and major adverse change in the physical environment, or if it would result in an overall major risk in the event of a crude oil release. The analysis also addresses direct and indirect effects collectively by resource.

This Executive Summary focuses on effects (adverse and beneficial) that are moderate or major and long-term or permanent as well as the primary areas of interest to the public and Tribes. Further, the EIS includes detailed effects analysis of all five alternatives under each resource.

ES.3.1. RELIABILITY AND SAFETY

The reliability and safety of the Project is a primary area of interest for the public and Tribes, who have expressed concern that a release would impact Tribal hunting and fishing rights as well as water quality in the Missouri River. The transportation of crude oil via pipeline is regulated by the Pipeline and Hazardous Materials Safety Administration (PHMSA) pursuant to 49 CFR Part 195. The Project has been designed to meet or exceed the minimum requirements of PHMSA regulations. The Project design standards include specifications regarding pipe design such as increased pipe wall thickness for improved stability and pipe coatings that reduce the risk of corrosion, pipe burial depth, locations of mainline valves, pre-operational inspections and testing, communication and monitoring systems, landowner outreach, release response capabilities, and oil cleanup exercises and drills. Dakota Access has also developed two response plans submitted to PHMSA—the Geographical Response Plan (GRP) and Facility Response Plan (FRP)—in compliance with 49 CFR 194.107 (see Appendix F). These plans include notification procedures, release detection and mitigation procedures, and training procedures, among other details.

As Lake Oahe is considered a high -consequence area (HCA), Dakota Access was required to prepare a pipeline integrity plan for the Project to identify potential threats and establish detailed inspection requirements. An independent risk assessment has been conducted to review these risks along with other concerns expressed by the SRST. Risk analysis and the probability of a crude oil release considered in terms of frequency is discussed in Section 3.1, Reliability and Safety. Construction and operation of the Project has resulted in no crude oil releases from the pipeline at the Lake Oahe crossing or elsewhere along the DAPL Project right-of-way to date. Ten releases have occurred at aboveground, upland facilities involving less than five barrels (approximately 210 gallons) of released crude in each case. All crude oil was recovered, meaning that response activities removed the crude oil from the impacted areas. Dakota Access stated that it evaluates every release for cause and once determined, corrective actions are implemented to prevent recurrence. Similarly designed facilities are then proactively reviewed for necessity of like preventative and/or mitigative measures. Dakota Access also internally analyzes accident causes across the organization for trends and communication findings to raise awareness across operations.

Not granting the easement and removing the pipeline under Alternative 1 would result in environmental and safety risks, including risks associated with the potential release of residual hydrocarbons from the drained pipeline and construction hazards that could result in injury or fatality of workers. However, the likelihood of a fatality is determined to be very unlikely based on Occupational Safety and Health Administration (OSHA) statistics. Following abandonment by removal, there would be no further risk associated with a crude oil release. Abandoning the pipeline in place under Alternative 2 would involve risks associated with the potential release of residual hydrocarbons from the drained pipeline, although any leaks would be onshore and more easily detectible, contained, and remediated. Following abandonment, there would be no further risk of a crude oil release at Lake Oahe.

Potential hazards associated with granting the easement under Alternatives 3 and 4 would be associated with a potential crude oil release. In accordance with agency requirements and public input, Dakota Access developed two modeling reports presenting the results of 1,160 modeling runs covering various environmental conditions (e.g., wind speed/direction, water levels, water flow, ice cover) for the impacts of a worst-case discharge (WCD). Of these modeling simulations, 18 representative scenarios were selected considering mitigated and unmitigated responses, ice and no-ice conditions, varying seasons of the year, and other possibilities that would alter the impacts of a WCD. The transport and fate of contaminants from a crude oil release at or adjacent to Lake Oahe under Alternatives 3 and 4 were evaluated based on the crude oil consequence modeling of a 10-day, unmitigated full-bore release (FBR) from two locations: the ND-380 valve site and a hypothetical pipe at the bottom of Lake Oahe. Based on this evaluation, harmful crude oil constituents would affect the water surface, water column, and shoreline of Lake Oahe and the Cannonball River at varying distances and concentrations. Based on historic pipeline data, the likelihood of an FBR along the pipeline under Lake Oahe or at the adjacent valve site occurring was determined to be remote to very unlikely, respectively.

Unmodeled release scenarios were also evaluated, including a slow or rapid release of crude oil beneath Lake Oahe and a slow release at the ND-380 valve site. Crude oil released underground is expected to involve a slow seepage of oil that would likely emerge onshore, with the potential to flow downslope to the Cannonball River and Lake Oahe. The likelihood of a slow release from the ND-380 valve site and pipeline was determined to be remote to unlikely. Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, describes in detail the rationale for this conclusion. Similarly, impacts associated with a slow-release valve scenario would be based on slower release rates and the quantity of oil reaching the surface, presenting a minor risk to sensitive resources.

Under Alternative 4, increased mitigation measures, more advanced leak detection and protection tools, and more stringent conditions would further increase the reliability and safety of the pipeline.

Under Alternative 5, new potential hazards could occur as a result of construction, abandonment, and operation. Pipeline abandonment involves the risk of an inadvertent release of hydrocarbons, although a release would be quickly detected and promptly contained and remediated. Construction and operation hazards could result in injury or fatality of workers. The likelihood of a fatality would be very unlikely based on OSHA statistics. Operational impacts due to an inadvertent release of crude oil from the pipeline would be similar to those described for Alternatives 3 and 4, although the North Bismarck Reroute would cross more HCAs (including two HCA urban areas), waterways, grasslands, and agricultural areas than the existing route. Similar to Alternatives 3 and 4, an FBR has a remote to very unlikely potential of occurrence. Section 3.1.6.5, [Reliability and Safety, Impacts and Mitigation] Alternative 5, describes in detail the rationale for this conclusion. The use of truck and rail would result in an increased risk from accidents that result in harm to the environment and human lives, including increased emissions and a greater frequency of crude oil releases, fires, and explosions than with a pipeline. Rail has a notable increased risk of fatality resulting in a risk ranking of major under Alternative 5, which is considered significant. Including the extensive construction impacts associated with Alternative 1 and the fatality impacts associated with trucking or rail under Alternative 5, the combined construction and operational impacts on reliability and safety for Alternatives 5 and 1 or Alternatives 5 and 2 would be significant.

ES.3.2. GEOLOGY AND SOILS

ES.3.2.1. Geology

Abandonment by removal activities associated with Alternative 1 would result in impacts on geologic resources. Removal of the pipe from under Lake Oahe would have a significant long-term, if not permanent, effect and is anticipated to be a major alternation of the resource character due to the deep excavation of the lakebed by mixing and/or breaking up geologic strata. Alternative 1 would have a long-term, major, significant impact on Lake Oahe, its tributaries, and other sensitive resources should cofferdams, bench slopes, or stockpiles of excavated loose, saturated sediments fail and cause a landslide. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

The Project’s operational impacts on geologic resources under Alternative 3 and 4 would be negligible because the ground contours have been restored and stabilized to pre-construction conditions, as feasible. However, should a crude oil release occur adjacent to or under Lake Oahe, impacts on geologic resources would range from temporary, minor impacts (e.g., shallow excavation to replace contaminated soils) to long-term, major impacts similar to Alternative 1 (e.g., deep excavation to replace contaminated sediments and repair/replace the pipeline in Lake Oahe). As such, a WCD crude oil release would result in a negligible to moderate risk to geologic resources. As the potential for a crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

Under Alternative 5, impacts from the construction of the North Bismarck Reroute on surface geological resources would be expected to be temporary and minor due to ground disturbance from construction and abandonment activities; and permanent, minor impacts from the permanent placement of 11 aboveground mainline valves. The use of trucking and/or rail to transport oil during construction would be negligible under normal operating conditions. However, if a crude oil release occurs, the excavation of contaminated materials would temporarily impact surficial geology in the area of the release; the magnitude of the impact would be dependent on the size of the release. Under Alternative 5, operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4. Additionally under Alternative 5, transportation of oil by truck or rail would result in more frequent, lower volume releases, which would cause short-term, minor impacts. Overall, the combined impacts from Alternatives 1 and 5 on geological resources would be significant given the intensity and duration of impacts from Alternative 1. Similarly, combined impacts from Alternatives 1 and 5 may pose a significant geologic hazard associated with the potential for landslides.

ES.3.2.2. Soils

If the easement is not granted and the Project pipeline is abandoned by removal, Alternative 1 would result in long-term, moderate impacts on soils due to the large volume of sediment that would be excavated from 77 acres of the lake bottom, along with 1,400 acres of upland disturbance along both shorelines associated with spoil storage. About 30 percent of the affected upland area is considered prime farmland. Impacts often result from soil compaction, soil loss from erosion of stockpiled material, and permanently altered soil conditions. However, overall impacts would not be considered significant. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

Operational impacts under Alternatives 3 and 4 resulting from an inadvertent release of crude oil would result in temporary to long-term, minor to moderate impacts. However, as previously described, the potential of occurrence is extremely low and the risk of impacts on soils is negligible to minor.

Alternative 5 impacts would be similar to those of Alternatives 3 and 4 were a release to occur. The combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on geological resources would not be significant.

ES.3.3. Water Resources

ES.3.3.1. Surface Water

Abandonment activities associated with Alternative 1 would result in impacts on water quality and water intakes. While Project design would incorporate avoidance of mapped waterbodies to the extent possible, Alternative 1 would have long-term, moderate, non-significant impacts on surface water due to abandonment activities. Additionally, the potential release of contaminants from equipment and the elevated turbidity levels within the water column during excavation would directly affect water quality of

Lake Oahe and associated water intakes. Sediment transport modeling indicates suspended sediments could travel as far as 160 miles downstream. Alternative 2 would be less likely to affect surface waters as ground disturbance would be limited. Potential stormwater runoff from upland workspaces would result in temporary, negligible impacts on surface waters if appropriate best management practices for erosion control are implemented.

Alternatives 3 and 4 include the risk of a crude oil release occurring adjacent to or under Lake Oahe. In the event of a WCD crude oil release under Alternative 3, short- to long-term and minor to moderate water quality impacts would occur on surface waters. With the implementation of mitigation measures, temporary to long-term, minor to major impacts would occur on agricultural and drinking water intakes, depending on the depth of the intake and how long the intakes are offline. The SRST, CRST, and Mni Wiconi Project drinking water intakes would not likely be affected.

Under Alternative 4, the consequences of a release would be similar but less intense than Alternative 3 on water quality and surface water intakes resulting in temporary to long-term, minor to major impacts with an overall risk of negligible to moderate. To further reduce the impacts of a crude oil release, Alternative 4 includes additional easement conditions, including that Dakota Access develop a plan for supplying an alternative source of clean, safe water to any affected water intake users for agricultural applications and drinking water in the event a crude oil release occurs at the Lake Oahe crossing until cleanup occurs and water at the intake is clean and safe for the applicable uses. However, as the potential for a crude oil release is remote to very unlikely, these alternatives would not significantly impact surface waters.

Under Alternative 5, impacts from construction and abandonment activities may affect two source water protection areas and 149 mapped intermittent and perennial waterbodies due to increased turbidity and stormwater runoff. Similarly, installation and maintenance of best management practices would reduce the extent of potential impacts on surface water. The use of trucking and/or rail to transport oil during construction would have short-term, minor impacts on surface waters and downstream intakes should a release occur. Impacts during operations due to an inadvertent release of crude oil from the pipeline would likely be comparable to those described for Alternatives 3 and 4, with temporary to long-term, minor to major impacts on water quality and surface water intakes, although the potential for occurrence is low.

ES.3.3.2. Groundwater

Dewatering associated with abandonment by removal activities for Alternative 1 would have long-term, minor impacts on groundwater that would not be significant. Impacts would occur from spoil storage areas, which may reduce soil permeability. Alternative 2 would have no impact on groundwater because the pipeline would be abandoned in place.

Under Alternatives 3 and 4, a crude oil release occurring adjacent to or under Lake Oahe would result in temporary, minor (e.g., from a shallower release) to long-term, major impacts depending on the location, volume, and extent of the release if it resulted in groundwater contamination. However, the potential for occurrence is remote to very unlikely.

To further reduce the impacts of a crude oil release, Alternative 4 includes a new easement condition that Dakota Access shall install a groundwater monitoring network within surficial aquifers connected to Lake

Oahe to monitor for the presence of petroleum-based hydrocarbons and make sampling results publicly available online and to the USACE, North Dakota Department of Environmental Quality (NDDEQ), and interested Tribes.

Under Alternative 5, impacts are anticipated to be temporary to short-term and minor from construction disturbances mitigated through erosion controls and the use of truck and/or rail for transportation during construction. A crude oil release during operation of the pipeline would result in similar impacts on groundwater as Alternative 3. The combined impacts from Alternatives 1 and 5 and the combined impacts from Alternatives 2 and 5 on groundwater would not be significant.

ES.3.3.3. Wetlands and Floodplains

Abandonment by removal activities associated with Alternative 1 would have long-term, minor impacts on wetlands associated with access roads and construction, as well as approximately 4.2 acres of wetlands and an approximately 0.6-acre pond in conceptual spoil storage locations outside the Project Area.

The Federal Emergency Management Agency has identified both sides of Lake Oahe as a Zone D area, which indicates areas with possible but undetermined flood hazards. The State of North Dakota Department of Water Resources' Risk Assessment Map Service indicates that a 500-year flood risk on both sides of the lake extend into adjacent areas that cross the Project workspace.

Abandonment by removal activities associated with Alternative 1 would have long-term, minor impacts on floodplains due to the development of spoil storage areas and access roads, which would inhibit water storage and potentially exacerbate downstream flooding.

Under Alternative 2, there may be impacts from minor ground disturbance during pipeline abandonment, resulting in temporary, negligible impacts on floodplains.

Long-term, moderate impacts on up to 268 mapped National Wetlands Inventory wetlands (approximately 2,507 acres) located adjacent to Lake Oahe may occur if a WCD crude oil release occurs under Alternative 3 or 4. Anticipated contamination impacts that diminish ecological functions include, but are not limited to, wildlife support and water quality processes. However, the likelihood of occurrence is remote to very unlikely, resulting in a negligible to minor risk to wetlands. Further, Dakota Access has in place a number of measures to mitigate a release, including automated valve shutoffs and plans for dispatching personnel to the Lake Oahe valves if communications with the valves are compromised.

Under Alternative 5, impacts from construction and abandonment activities would potentially have temporary to long-term, minor to moderate impacts on up to 77 mapped National Wetlands Inventory wetlands (totaling about 21 acres) due to temporary trenching and filling during construction activities. However, implementation of wetland permit restoration and mitigation requirements would reduce or offset these impacts. The use of trucking and/or rail to transport oil during construction would also have impacts on wetlands should a release occur. During operation of a reroute under Alternative 5, there is the potential of a crude oil release resulting in temporary to long-term and minor to moderate impacts on wetlands depending on site specific details. Combined construction and operational impacts on wetlands for Alternatives 1 and 5 and Alternatives 2 and 5 would not be significant.

Alternative 5 may have temporary to short-term, negligible to minor impacts on floodplains associated with construction trenching and spoil piles and operations. Combined construction and operational impacts on floodplains for Alternatives 1 and 5 and Alternatives 2 and 5 would not be significant.

ES.3.4. VEGETATION AND NOXIOUS WEEDS

If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternative 1, potential impacts on vegetation from abandonment activities would occur. Alternative 1 would have localized, long-term, moderate intensity, but non-significant impacts on vegetation including the smothering of approximately 77 acres of vegetation by excavation spoils until abandonment by removal is complete. The use of approximately 2,000 to 7,000 trees for timber mats, and the use of aquatic and emergent aquatic plants within Lake Oahe to alter flow around the cofferdams, would also be considered a long-term impact.

Alternative 1 is expected to result in impacts from noxious weeds known to occur within the Project Area including leafy spurge (*Euphoribia esula*) and Canada thistle (*Cirsium arvense*). Alternative 1 would have short- to long-term, moderate impacts should noxious weeds become established within construction areas. However, the implementation of mitigation measures in the Environmental Construction Plan (Appendix G of the EA [USACE, 2016]) would decrease the extent of proliferation. Alternative 2 would have a lesser effect on the spread of noxious weeds as earthwork associated with abandonment activities would be limited. Ground disturbance results in short- to long-term, minor impacts, but with the implementation of mitigation measures in the Environmental Construction Plan, potential impacts are not expected to be significant.

Assuming cleanup efforts occur promptly to mitigate the effects of a crude oil release adjacent to or under Lake Oahe under Alternatives 3 and 4, short- or long-term, minor to moderate impacts on shoreline vegetation could be reduced to temporary impacts of minor intensity. Given the remote to very unlikely likelihood of a release occurring, the resulting risk of a release on vegetation would be negligible and not result in a significant impact.

With the implementation of weed management measures, normal operations would be expected to have short- to long-term, minor, localized impacts on the spread of noxious weeds that are not significant.

Under Alternative 5, impacts from construction and abandonment activities would be expected to involve short-term, minor to moderate impacts on vegetation due to temporary ground disturbance along the right-of-way. The use of trucking and/or rail to transport oil during construction would have short- to long-term, minor to moderate impacts on vegetation should a crude oil release occur. Noxious weed spread and establishment impacts associated with Alternative 5 would be short- to long-term and minor to moderate for construction and abandonment activities. Operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4.

ES.3.5. WILDLIFE AND AQUATIC RESOURCES

ES.3.5.1. Wildlife

Wildlife in the affected area includes important game species, including subsistence species and migratory birds, which are protected under the Migratory Bird Treaty Act. The Project Area is within the Central Flyway, one of four major migratory routes relied upon by migratory birds for spring and fall travel through North America. In addition, the Project Area is located within two bird conservation regions that together contain 38 migratory bird species designated by the USFWS as Birds of Conservation Concern. Seven and eight species recognized as Level I and II Species of Conservation Priority by the State of North Dakota also occur in the affected area and have the potential to be affected by the Project. They include migratory birds, a non-migratory bird, mammals, reptiles, insects, and an aquatic invertebrate.

If the easement is not granted and the pipeline were abandoned by removal at the Lake Oahe crossing under Alternative 1, impacts on wildlife from abandonment and removal activities would occur. Alternative 1 would have long-term, major impacts on wildlife from habitat loss during removal activities, and wildlife injury and mortality caused by dredging activities and spoil storage in and adjacent to Lake Oahe. As habitat and local wildlife populations would be expected to recover within two to three seasons following removal and restoration activities, impacts would not be significant. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

Granting the easement under Alternatives 3 and 4 would result in no additional construction impacts, and no disturbance to wildlife or wildlife habitat from routine operation and maintenance of the buried pipeline would be anticipated. Short- to long-term moderate to major impacts would occur on wildlife should a WCD crude oil release occur as a result of Alternatives 3 or 4. A WCD release event would result in habitat contamination and wildlife injury and mortality. However, the potential for a WCD crude oil release is considered remote to very unlikely; therefore, these alternatives are not expected to have significant impacts.

Under Alternative 5, impacts from construction of the North Bismarck Reroute on wildlife would be expected to involve temporary and permanent, negligible to moderate impacts on wildlife due to habitat disturbance, lighting, and noise during construction activities; and permanent, minor impacts from the construction of 11 aboveground mainline valves. With the implementation of mitigation requirements, impacts would not be significant. Temporary impacts from lighting and noise would occur from activities associated with abandonment of about 100 miles of the existing pipeline. The use of trucking and/or rail to transport oil during construction would have short- to long-term, minor to moderate impacts on wildlife due to noise and light disturbance, potential collisions with vehicles, and harm from potential crude oil releases in the event of an accident. Operational impacts due to an inadvertent release of crude oil would be comparable to those described for Alternatives 3 and 4, with short- to long-term moderate to major impacts but a very unlikely potential of occurrence.

ES.3.5.2. Aquatic Resources

Abandonment by removal activities associated with Alternative 1 would have short- to long-term, major impacts on aquatic resources from habitat loss during removal activities, and injury and mortality of organisms caused by dredging activities and spoil storage in and adjacent to Lake Oahe. Impacts would be significant as mortality would be expected along with long-term reduced productivity of local aquatic species populations. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

Granting the easement under Alternatives 3 and 4 would result in short- to long-term, moderate to major impacts on aquatic resources should a WCD crude oil release occur adjacent to or under Lake Oahe due to habitat contamination and aquatic and semi-aquatic species injury and mortality. Remediation efforts may also result in short- to long-term minor to moderate impacts on aquatic resources. Because the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

To further reduce the risk and impacts of a crude oil release, Alternative 4 includes additional easement conditions requiring Dakota Access to:

- Conduct biannual visual surveys, surface water sampling, and sediment and/or benthic macroinvertebrate (BMI) sampling at the Lake Oahe crossing to monitor for the presence of petroleum-based hydrocarbons, and make sampling results publicly available online and to the USACE, the NDDEQ, and interested Tribes; and
- Conduct polycyclic aromatic hydrocarbons fish tissue sampling should a crude oil release occur to support when polycyclic aromatic hydrocarbon levels in fish return to pre-release conditions and make testing results publicly available online and to the USACE, the NDDEQ, and interested Tribes.

Under Alternative 5, impacts from construction and abandonment activities on aquatic resources would be expected to involve temporary and minor to moderate impacts due to habitat disturbance and a temporary increase in stress and mortality of aquatic organisms during pipeline installation through waterbodies and wetlands. Impacts would be reduced with the implementation of permitting mitigation requirements. The use of trucking and/or rail to transport oil during construction would have short- to long-term, minor to moderate impacts on aquatic resources should a crude oil release occur. Operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4. Overall, the combined impacts from Alternatives 1 and 5 on aquatic resources would be significant given the intensity and duration of impacts from Alternative 1.

ES.3.5.3. Federally Protected Wildlife Species

Federally protected species that have been documented in the affected area include piping plover (*Charadrius melodus*), northern long-eared bat (*Myotis septentrionalis*), bald eagle (*Haliaeetus leucocephalus*), and golden eagle (*Aquila chrysaetos*). Designated piping plover critical habitat occurs in the affected area on sandbars in, and adjacent to, Lake Oahe. The interior least tern (*Sternula antillarum athalasos*) has been observed within the affected area, although it is no longer listed under the Endangered Species Act (ESA). Federally protected species likely to occur within the affected area based on the presence of suitable habitat and include rufa red knot (*Calidris canutus rufa*) and whooping crane

(*Grus americana*). The bald eagle and golden eagle are protected under the Bald and Golden Eagle Protection Act, which prohibits the take, possession, exchange, or transport of any bald or golden eagle unless allowed by permit. The USACE underwent informal consultation with the USFWS based on documented occurrences of the northern long-eared bat and piping plover. USACE is reinitiating informal consultation with the USFWS based on recent changes to the listing of northern long-eared bat from threatened to endangered. Recent surveys performed by the SRST did not identify any suitable Dakota skipper (*Hesperia dacotae*) habitat within the Project Area. The selection of an alternative with the potential for adverse effects on a federally listed species or designated critical habitat could require additional consultation.

If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternative 1, impacts on federally listed species, designated critical habitat, and bald and golden eagles from abandonment activities would occur. Alternative 1 would have short- to long-term, major impacts on piping plover and piping plover critical habitat due to habitat loss or degradation during removal activities. Disturbance, injury, and mortality of individuals caused by dredging activities and spoil storage in and adjacent to Lake Oahe would impact the aforementioned species. Impacts would be significant and would be *likely to adversely affect* these species and critical habitat. Long-term minor impacts on the rufa red knot and whooping crane would occur due to noise disturbance and displacement during removal activities, which would result in a *may affect, not likely to adversely affect* determination, as the impacted species would be expected to move on from the affected area along the associated migratory routes. The same noise disturbance and displacement would also affect the northern long-eared bat, although impacts would be long-term and minor to moderate given the potentially limited available habitat in the area. Impacts would result in a *may affect, not likely to adversely affect* determination on the northern long-eared bat. Widespread habitat disturbance and loss of milkweed host plants would result in short-term to long-term moderate impacts on the monarch butterfly (*Danaus plexippus*). Impacts would result in a *may affect and is likely to adversely affect* determination on the monarch butterfly. Bald and golden eagles would experience a long-term reduction in available aquatic prey at the crossing location due to displacement or mortality; however, impacts would be negligible given the abundant prey in adjacent areas.

Alternative 2 would be less likely to affect federally protected species given the limited activities required for abandonment. Temporary, minor impacts on the piping plover, rufa red knot, whooping crane, monarch butterfly, and northern long-eared bat would occur due to disturbance from lighting and noise. Given the minor, temporary impacts on these species, impacts would not be significant, resulting in a *may affect, not likely to adversely affect* determination for the listed species.

Granting the easement under Alternatives 3 and 4 would result in no additional construction impacts and no impacts on federally listed species or bald and golden eagles from routine operation and maintenance of the buried pipeline. In the event of a WCD crude oil release at the Lake Oahe crossing, short- to long-term major downstream impacts would occur on pallid sturgeon due to habitat contamination, injury, and mortality. Temporary to short-term moderate to major impacts would occur on piping plover and piping plover critical habitat due to contamination and behavioral disturbances. Meanwhile, short-term minor to moderate impacts would occur on rufa red knot, whooping crane, and northern long-eared bat due to disturbance, displacement, and contaminated food and water sources. However, with the remote to very unlikely occurrence, impacts from a Lake Oahe crossing crude oil release are considered discountable under the ESA, which would result in a *may affect, not likely to adversely affect* determination to these federally listed species. Therefore, these alternatives would not be expected to have significant impacts. Similarly, a WCD crude oil release would have temporary to long-term, and minor to major, non-significant impacts on bald and golden eagles due to disturbance, displacement, and contaminated food and water sources. Further, Alternative 4 includes an additional easement condition requiring Dakota Access to conform to the *National Bald Eagle Management Guidelines* (USFWS, 2007) and minimize off-road vehicle traffic in the event of any required remediation activities.

Under Alternative 5, impacts from the abandonment of the existing pipeline would have short-term, major impacts on Dakota skipper and monarch butterfly based on known occurrences of these species as a result of mortality caused from trenching, habitat disturbance, vegetation clearing, and soil compaction or incidental releases of hazardous substances. These impacts would be *likely to adversely affect* these species and result in significant impacts. Tree removal would affect suitable habitat for the northern long-eared bat, bald eagle, and golden eagle. Operational impacts due to an inadvertent release of crude oil from the Lake Oahe crossing would be comparable to those described for Alternatives 3 and 4, with temporary to long-term minor to major impacts and a very unlikely potential of occurrence, resulting in non-significant impacts. Alternative 5 impacts on piping plover, piping plover critical habitat, northern long-eared bat, and rufa red knot would be non-significant and result in a *may affect, not likely to adversely affect* determination. Impacts on bald and golden eagles would be mitigated with adherence to the USFWS National Bald Eagle Management Guidelines. As there would be no impacts on Dakota skipper from Alternatives 1 and 2, the combined construction operation impacts with Alternative 5 would be unchanged and would still be significant. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operational impacts on piping plover and piping plover critical habitat for Alternatives 5 and 1 would be significant.

ES.3.6. LAND USE AND RECREATION

ES.3.6.1. Land Ownership and Land Use

If the easement is not granted and the pipeline is abandoned by removal at the Lake Oahe crossing under Alternative 1, this would have long-term moderate impacts on land ownership due to the establishment of approximately 1,477 acres of temporary construction easements on private and federal property adjacent to the Lake Oahe crossing. This would limit the activities landowners could perform during abandonment by removal activities; however, land ownership would return to normal following construction, and impacts would not be significant. Impacts on land use and disruptions to grazing would be short- to long-term, major, and significant. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

The unlikely occurrence of an unanticipated release of crude oil adjacent to or beneath Lake Oahe under Alternatives 3 or 4 would result in a negligible risk on land ownership and a negligible to moderate risk on land use as a result of the need to obtain temporary easements to conduct oil remediation activities and disruptions in grazing and irrigation, which would not be significant. Affected lands may include private, state, federal, and tribal property. Following remediation, land ownership and land use would return to normal.

Under Alternative 5, impacts from construction and abandonment activities would have permanent, moderate impacts on land ownership due to the need for new pipeline easements across state and private property for the reroute, but not significant. The combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on land ownership would not be significant. The combined impacts from Alternatives 1 and 5 on land use would be significant given the intensity and duration of impacts from Alternative 1, while the combined impacts from Alternatives 2 and 5 would not be significant.

ES.3.6.2. Recreation and Special Interest Areas

Lake Oahe and its shoreline are open to the public for passive recreational activities including fishing, swimming, sightseeing, bird watching, camping, and picnicking. Other recreation and special interest areas include the Cannonball South Area along the Cannonball River at the junction with Lake Oahe, and the Fort Yates and Walker Bottom Recreation Areas, both of which are managed by the SRST and occur south of the Project Area along Lake Oahe.

If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternative 1, impacts on recreation from abandonment activities would occur. Alternative 1 would have long-term, moderate impacts on recreation from disruptions to boating and recreational activities as well as hunting and wildlife viewing on Lake Oahe. A relatively small amount of Lake Oahe would be affected; therefore, impacts would not be considered significant. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

Alternatives 3 and 4 would result in short-term, moderate to major impacts as a result of a disruption to recreational activities associated with Lake Oahe in the event that a WCD crude oil release occurs. The likelihood of a WCD crude oil release is remote to very unlikely, and thus impacts would not be significant.

Under Alternative 5, the North Bismarck Reroute is close to or crosses multiple conservation easements / habitat management areas, National Wildlife Refuges, state trust lands, waterfowl production areas, and private tribal lands. Impacts from construction and abandonment activities would have temporary, moderate impacts on recreation due to disruptions to recreational activities. Operational impacts due to an inadvertent release of crude oil from the pipeline would affect activities in adjacent recreational areas, although this would have a remote to very unlikely potential of occurrence.

ES.3.7. Cultural Resources

There are no known historic properties in the area of potential effects. If cultural resources should be found during Project activities for any of the five alternatives, mitigation measures would be implemented to avoid or minimize impacts according to Dakota Access's plan for addressing unanticipated discoveries of cultural resources or human remains.

ES.3.8. SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND HEALTH

ES.3.8.1. Socioeconomics

Impacts on socioeconomics from abandonment activities would occur under Alternatives 1 or 2. Alternative 1 would have long-term, negligible, beneficial impacts on the economy and local housing from the employment of a temporary workforce consisting of about 750 jobs and 2,200 indirect jobs. Conversely, the shutdown of the pipeline would have long-term to permanent, major adverse impacts on the economy due to the loss of about 600 to 700 jobs, and a decrease in state tax revenue of approximately $187 million over 2 years (according to State of North Dakota estimates based on the July 1, 2023, through June 30, 2025, budget period). This loss would represent a 5 percent reduction in state oil and gas tax revenues during that period. Overall, the net impact would be significant and adverse. Alternative 1 would also have an indirect effect on tribal oil and gas extraction. The Mandan, Hidatsa, and Arikara (MHA) Nation estimates revenue loss that would exceed $160,000,000 over a 1-year period.

Alternative 2 would have similar although lesser beneficial impacts on the economy from the employment of a temporary workforce as Alternative 1, countered by the same long-term to permanent, major, adverse impacts on the economy. The net impact would be significant and adverse.

Under Alternatives 3 and 4, Project operations would have a permanent, major, significant, beneficial economic impact from employment and tax revenues to the State of North Dakota and Morton and Emmons counties. Temporary, major economic impacts would occur to recreation and agricultural water intakes in the event of a WCD crude oil release adjacent to or under Lake Oahe; however, given that the likelihood of a WCD crude oil release at the Lake Oahe crossing is remote to very unlikely, the socioeconomic risk is minor to moderate.

Under Alternative 5, construction of the North Bismarck Reroute and abandonment of about 100 miles of the existing pipeline would result in temporary beneficial impacts on the economy due to the employment of a temporary workforce consisting of about 1,050 temporary jobs and 4,200 temporary indirect jobs. Operation would have a permanent, beneficial economic impact through net gain in ad valorem taxes for more counties, including Emmons, Oliver, Burleigh, Mercer, and Morton counties, although Mercer and Morton counties would experience a tax decrease. These generally beneficial effects would be countered by short-term, mild to moderate, adverse impacts caused respectively by increased demands on medical and emergency services, and increased costs to farmers associated with the shipping of agricultural products due to an increase associated with oil during construction. The State of North Dakota also expects that trucking and rail would be unable to accommodate the entire capacity of DAPL, leading to oil rig closures. This would result in a revenue loss for North Dakota's oil producers and the State, and thereby would result in a significant, moderate, adverse impact. The overall combined impacts on socioeconomics from Alternatives 1 and 5 or Alternatives 2 and 5 would be significant and adverse.

ES.3.8.2. Environmental Justice

Environmental justice and the impact of the Project on Tribes, particularly SRST, is a primary area of interest for the public and Tribes. This EIS substantially expands the Environmental Justice analysis from the 2016 EA to include the SRST and the CRST as identified environmental justice communities.

Throughout the development of this EIS, the USACE consulted to obtain input and insight from Tribes through invitations to act as cooperating agencies, engage in government-to-government consultation, and participate in Tribe-specific scoping meetings. A deeper analysis of effects to Tribal water rights and subsistence rights is included.

For Tribal Nations, the Missouri River is characterized as "The Water of Life," and the very water that created the corridor is considered sacred. When the USACE built six main-stem dams on the Missouri River, life for the Indigenous Peoples who called the river home changed immediately and dramatically. This has been problematic for Tribes and Tribal Peoples who see these resources holistically.

The United States has a unique legal relationship with Indian tribal governments as set forth in the Constitution of the United States, treaties, statutes, Executive Orders, and court decisions. The federal government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Tribal Nations. The USACE recognizes these trust relationships/responsibilities and will continue to work with Indian Tribes on a government-to-government basis to fulfill all federal responsibilities.

Abandonment by removal activities associated with Alternative 1, which involves the removal of the pipe from under Lake Oahe, would have short- to long-term, moderate impacts on the availability of subsistence resources at the crossing location and downstream due to habitat disturbance, and wildlife and fish injury or mortality caused by dredging or excavation activities. This would subsequently result in a short- to long-term, moderate impact on treaty rights and environmental justice communities. Impacts would be significant. Alternative 2 would not have these same impacts because the pipeline would be abandoned in place.

In the event that a WCD crude oil release occurs adjacent to or under Lake Oahe under Alternatives 3 or 4, short- to long-term, major impacts on the disturbance of wildlife from routine operation and on the availability of subsistence resources (e.g., game species) would occur at the crossing location and downstream. As a result, a short- to long-term, moderate impact on subsistence and treaty rights would occur, which include the right to practice subsistence harvesting. As the potential for a crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

To further reduce the risk of a crude oil release, Alternative 4 includes additional new easement conditions for Dakota Access to:

- Implement improved leak detection systems for the crossing as new technology becomes available, and implement frequent drills and simulations for emergency response and preparedness with potentially affected communities in the event of a release incident;
- Develop a plan for food distribution to environmental justice communities that rely on traditional subsistence resources and require provision of supplemental food according to the plan in the event of a crude oil release from DAPL at the crossing that affects food supplies; and
- Coordinate with the SRST and the CRST to undertake systematic subsistence studies.

Under Alternative 5, construction and operation of the North Bismarck Reroute, abandonment of about 100 miles of the existing pipeline, and short-term use of truck and rail to transport oil during construction would result in temporary to long-term, negligible to moderate impacts on subsistence resources and treaty rights. However, as most of the reroute would occur on private land where access is limited, impacts would not be significant. Overall, the combined impacts from Alternatives 1 and 5 on environmental justice, treaty rights, and subsistence would be significant given the intensity and duration of impacts from Alternative 1. Additionally, relocating the existing pipeline north of Bismarck within an uncontrolled section of the river would only marginally reduce impacts on the Standing Rock residents, as a WCD release would likely reach Lake Oahe. Additional risk would potentially be imposed on the Native American populations of Bismarck-Mandan under Alternative 5, while also affecting SRST and CRST individuals who use northern portions of Lake Oahe for subsistence practices.

ES.3.8.3. Health

Abandonment by removal activities associated with Alternative 1 would have short- to long-term, major impacts on the health of community members due to the potential reduced nutritional intake from the lower availability of subsistence resources at the crossing location, in addition to minor impacts associated with increased road traffic, which could increase the risk of vehicular accidents. As such, the impacts on food acquisition and nutritional intake could be significant. There would be no operational impacts on health under Alterative 2 as the pipeline would be abandoned in place and cease to operate.

Alternative 1 would also have indirect effects on tribal oil and gas extraction. The MHA Nation commented that the Tribe would lose millions of dollars in tax and royalty revenue while oil is not flowing through the pipeline, which transports a large percentage of the MHA Nation's oil production to market. This loss would considerably reduce the funding that the MHA Nation allocates for programs such as drug enforcement, health clinics, health insurance, child and elder care services, and emergency management centers. Alternative 1 would result in adverse economic impacts on the MHA Nation's health programs. The overall economic impacts on the MHA Nation's tribal health programs under Alternative 2 would be same for Alternative 1.

Granting the easement under Alternatives 3 and 4 would result in no additional construction impacts, and no impacts from routine operation and maintenance of the buried pipeline would occur. However, if a WCD crude oil release occurs adjacent to or beneath Lake Oahe, the potential effects resulting from the ingestion of contaminated fish and/or water or from accidents/injuries to first responders during remediation activities would result in short- to long-term, minor to major impacts on the health of community members. Increased road traffic could also increase the risk of vehicular accidents.

As discussed above, to reduce potential health impacts from ingesting contaminated fish, Alternative 4 includes a new easement condition that Dakota Access develop a contaminated fish testing plan in the event of a crude oil release.

Alternative 5 would result in temporary to long-term, minor to moderate impacts on health due to pollutant emissions affecting air quality, the increased risk of vehicular accidents due to construction traffic, potential injury and mortality of workers, and the potential of a crude oil release during truck and rail transport or pipeline operation. However, based on risk levels and/or impact intensity, the construction and operation of the North Bismarck Reroute would not have significant impacts on health. Overall, the combined impacts from Alternatives 1 and 5 on health would be significant given the intensity and duration of impacts from Alternative 1.

The impacts transitioning to truck and/or rail transport of oil on the MHA Nation while the North Bismarck Reroute is permitted and constructed would result in short-term, adverse impacts on the tribal economy, including health programs.

ES.3.9. TRANSPORTATION AND TRAFFIC

Transportation and traffic impacts for the Project primarily involve ND Highway 1806 on the west side of Lake Oahe, ND Highway 1804 on the east side of Lake Oahe, and Lake Oahe itself (for boat traffic).

Operation of the pipeline would have a permanent moderate beneficial impact by eliminating the need for tanker trucks and trains to transport the crude oil through Morton County, avoiding the associated wear and tear and increased traffic on public roads and rail, and limiting the number of traffic-related fatalities (NDDOT, 2019). In the event of a crude oil release in or adjacent to Lake Oahe, local and regional vehicle traffic would experience temporary to short-term, minor to moderate impacts due to increased traffic, traffic restrictions, and traffic closures to support remediation activities along the lake as a result of Alternatives 3 and 4. Boating traffic would experience temporary to short-term, moderate to major impacts as a result of closures during remediation efforts. However, as the potential for a crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

Under Alternative 5, impacts from the construction of the North Bismarck Reroute would be expected to have short-term, minor impacts on local traffic due to lane and road closures for road improvements and construction. The use of trucking and/or rail to transport oil during construction could result in a greater number of smaller crude oil releases. For hazardous liquid transportation, the number of incidents resulting in serious injuries or fatalities is greater for truck or rail than pipeline (per volume transported) (Furchtgott-Roth and Green, 2013; PHMSA, 2018). The rate of all incidents resulting in a release of crude oil is also greater for truck and rail transportation; for pipelines, an incident occurred approximately once every 720 million gallons of crude oil shipped, as compared to once every 50 million gallons shipped by rail and once every 55 million gallons shipped by truck (PHMSA, 2018). The use of trucks and trains during construction would have a short-term, minor to moderate impact on rail transportation corridors and a short-term, moderate impact on road transportation in North Dakota due to increased traffic.

ES.3.10. AIR QUALITY

Alternative 1 would have a long-term, moderate, non-significant impact on local air quality associated with vehicle emissions.

Granting the easement under Alternatives 3 and 4 would result in no additional construction impacts on air quality. However, eligible intermittent adverse impacts on local air quality from routine maintenance activities would be expected to occur. Should a crude oil release occur adjacent to or under Lake Oahe, temporary minor impacts would occur on local air quality due to vaporization of crude oil resulting in volatile organic compound (VOC) and hazardous air pollutant (HAP) emissions, and from vehicle emissions associated with cleanup activities.

In the event of a crude oil release, air emissions would occur associated with the vaporization of the crude oil and cleanup activities, and impacts would be similar to those discussed above for Alternatives 3 and 4.

ES.3.11. Climate Change

Emissions of greenhouse gases (GHGs) contribute to climate change. If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternatives 1 or 2, GHG emissions from abandonment activities would occur. Considering the scope of construction work associated with Alternative 1, the amount of direct GHG emissions associated with Alternative 1 would likely be considerably larger than the GHG emissions associated with the original pipeline construction and occur over a period of 6 to 20 years or more. Although no GHG emissions would occur from operations under Alternative 1, the generation of GHG emissions from vehicles and equipment associated with abandonment activities would be long-term.

The limited scope of abandonment activities under Alternative 2 would result in the temporary generation of GHG emissions, which are likely smaller than the GHG emissions associated with the original pipeline construction. Because the pipeline would be abandoned, Alternative 2 would eliminate a small amount of operational GHG emissions associated with pipeline maintenance; however, because these emissions are negligible, abandonment would not result in any changes to climate change impacts associated with the Project.

Normal operation of the pipeline under Alternatives 3 and 4 across Lake Oahe would not generate any direct GHG emissions, with the exception of a minor amount of emissions associated with pipeline maintenance activities. Should a crude oil release occur under Alternatives 3 and 4, adjacent to or under Lake Oahe, temporary vehicle GHG emissions would occur during remediation activities.

GHG emissions would also increase under Alternative 5 because, even under the best-case scenario, rail and truck transportation would need to serve as an alternative to the DAPL Project during the construction of the North Bismarck Reroute.

Currently, there is no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment from the Project's incremental contribution of GHGs emissions to assess significance. Given limitations on the ability to determine localized or regional impacts from GHG emissions from the Project or the ability to determine the presence and extent of resource impacts, this EIS provides a general description of the observed environmental impacts attributed to climate change in the Project region, the scope of anticipated GHG emissions for each alternative, and the social costs of GHG emissions from past construction of the Project and operating downstream emissions. The EIS analysis includes the climate change impacts of construction activities, normal pipeline operations, oil release scenarios, and alternative oil transport methods (i.e., rail or truck). The EIS provides an estimate of the downstream GHG emissions from refining and consumption of oil transported by the pipeline. The EIS also explains that downstream refining and consumption of oil would also occur without the Project, although the amount of refining and consumption could be reduced due to the market effects of increased costs of transportation, changes to supply, or regulatory dynamics from domestic and international decarbonization efforts.

ES.3.12. CUMULATIVE IMPACTS

ES.3.12.1. Geology and Soils

Actions within the geographic scope that could potentially impact geology and soils include both livestock grazing and the DAPL Project and would only result in cumulative impacts associated with Alternatives 1, 2, and 5.

If the easement is not granted and the pipeline is abandoned under Alternatives 1 and 2, cumulative impacts would occur as the result of abandonment construction activities combined with any past effects from the DAPL Project. Impacts on geology and soils from Alternative 1 would be significant, and additional further contributions to those impacts from crop cultivation and livestock grazing would be minor. Ground disturbance under Alternative 2 would be minor; therefore, cumulative effects from the DAPL Project, crop cultivation, and livestock grazing are not expected to result in significant impacts. Similarly, abandonment activities under Alternative 5 along other portions of the DAPL Project within the same Hydrologic Unit Code (HUC-12) watershed would result in minor ground disturbance. Any resulting cumulative impacts from previous DAPL Project construction would be temporary to short-term and minor.

ES.3.12.2. Water Resources

Actions within the geographic scope that could contribute to impacts on water resources include the DAPL Project, crop cultivation, and livestock grazing. Cumulative impacts were identified for surface water and wetlands.

If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternative 1, cumulative impacts could occur as the result of abandonment activities in addition to potential future stormwater runoff from ground disturbance associated with crop cultivation and cattle grazing. Impacts on water resources from Alternative 1 would already be significant, and potential future contributions from crop cultivation and livestock grazing to those impacts would be minor. Potential ground disturbance resulting in stormwater runoff under Alternative 2 would be minor, and the cumulative effects from crop cultivation and livestock grazing would not result in significant impacts.

No actions were identified that would contribute to cumulative impacts on water resource impacts with Alternatives 3, 4, and 5 within the geographic and temporal scope of this analysis.

ES.3.12.3. Wildlife and Aquatic Resources

Actions within the geographic scope that could contribute to impacts on wildlife and aquatic resources include the DAPL Project.

ES.3.12.3.1. Wildlife

Granting the easement under Alternatives 3 and 4 would result in no additional cumulative impacts from construction. Since the construction areas have been restored, no cumulative impacts are anticipated as a result of routine operation and maintenance of the buried pipeline.

No actions were identified that would contribute to future cumulative impacts on wildlife with Alternatives 1 through 5 within the geographic and temporal scope of this analysis.

ES.3.12.3.2. Aquatic Resources

If the easement is not granted and the pipeline is abandoned at the Lake Oahe crossing under Alternative 1, cumulative impacts could occur as the result of abandonment activities along with potential future stormwater runoff from crop cultivation and livestock grazing. However, impacts on aquatic resources from Alternative 1 would already be significant, and potential contributions from the crop cultivation and livestock grazing to those impacts would be minor. Ground disturbance under Alternative 2 would be minor, and any cumulative effects from crop cultivation and livestock grazing are not expected to result in significant impacts.

Granting the easement under Alternatives 3 and 4 would result in no additional cumulative construction impacts on aquatic resources. Since soils have been stabilized in the years following construction, no cumulative impacts are anticipated as a result of routine operation and maintenance of the buried pipeline. Therefore, cumulative impacts under Alternatives 3 and 4 would not be significant.

No actions were identified that would contribute to future cumulative impacts on aquatic resources with Alternatives 3, 4, and 5 within the geographic and temporal scope of this analysis.

ES.3.12.3.3. Threatened and Endangered Species

If the easement is not granted and the pipeline abandoned at the Lake Oahe crossing under Alternative 1, minor cumulative impacts would occur on the northern long-eared bat as the result of abandonment activities that would increase sedimentation and turbidity in Lake Oahe, causing a reduction in prey abundance. The limited ground disturbance under Alternative 2 could result in minor cumulative impacts that would not be significant.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3 and 4. Since habitat has been restored in the years following construction and weed control measures implemented, no cumulative impacts are anticipated as a result of routine operation and maintenance of the buried pipeline. Therefore, cumulative impacts on federally listed species under Alternatives 3 and 4 would not be significant.

Under Alternative 5, abandonment of a portion of the DAPL Project would have adverse effects on Dakota skipper, which would create a cumulative impact on the species along with adverse effects from the DAPL Project construction in Dunn, McKenzie, and Mountrail counties. However, as affected populations have likely recovered from any impacts during the DAPL Project construction, cumulative impacts would be negligible. Therefore, Alternative 5 would have no significant cumulative impacts on federally listed species. The combined cumulative impacts of Alternative 1 and 5 or Alternatives 2 and 5 would not be significant.

ES.3.12.4. Cultural Resources

Actions that would contribute to cumulative impacts on cultural resources include the DAPL Project. Construction of the Project had no impact on historic properties or cultural resources and therefore did not contribute to cumulative impacts. No actions were identified that would contribute to future cumulative impacts on cultural resources for Alternatives 1 through 5 within the geographic and temporal scope of this analysis.

ES.3.12.5. Socioeconomics, Environmental Justice, and Health

Actions within the geographic scope that could contribute to cumulative impacts include the DAPL Project, DAPL Optimization Project, Emmons-Logan Wind Project, Emmons-Logan Transmission Line, Montana-Dakota Utilities Co. Mandan to Ellendale Upgrade Project (electric transmission line), and Oliver III Wind Energy Center.

ES.3.12.5.1. Socioeconomics

If the easement is not granted at the Lake Oahe crossing under Alternatives 1 and 2, cumulative impacts could occur as the result of pipeline abandonment. Alternatives 1 and 2 would contribute to cumulative beneficial impacts with other actions through the creation of both long-term and temporary jobs, increased local and state hospitality, and tax revenues during the abandonment process. Conversely, ceasing operation would result in an adverse impact on the economy through lost revenue and jobs. Given the positive economic impacts associated with the actions listed above, there would be no negative cumulative impacts on the economy, and long-term and temporary minor beneficial cumulative impacts under Alternatives 1 and 2. Cumulative impacts would not be significant.

Granting the easement under Alternatives 3 and 4 would result in no additional cumulative impacts from construction on socioeconomics. Future significant cumulative beneficial local impacts are anticipated to occur from increased and sustained employment and tax revenue. Therefore, cumulative impacts under Alternatives 3 and 4 combined with the actions above would be beneficial and significant.

Construction and operation of the North Bismarck Reroute under Alternative 5 would contribute to cumulative beneficial impacts on the economy due to tax revenue and employment along with the operation of the actions listed above. Similar to Alternative 3 and 4, impacts would be significant. The combined cumulative impacts for Alternatives 1 and 5 and Alternatives 2 and 5 would be beneficial and significant.

ES.3.12.5.2. Environmental Justice, Treaty Rights, Subsistence, and Health

Cumulative impacts related to environmental justice as a result of the Project, combined with the actions described above, are unknown as environmental justice reviews were not identified in the publicly available information associated with any of the above actions.

As the actions are primarily located on private land where subsistence resources are less accessible, potential cumulative adverse effects on treaty rights and subsistence due to the temporary dispersal or unavailability of subsistence resources during construction would be negligible and not significant.

Past temporary, minor cumulative impacts on health from the above actions and the Project could have occurred as a result of accidents and injuries during construction. No actions have been identified that would contribute to future cumulative impacts on health due to accidents and injuries or other causes for Alternatives 1 through 5 within the geographic and temporal scope of this analysis.

ES.4. REFERENCES

CEQ (Council on Environmental Quality). 1981. *Memorandum to Agencies: Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations*. March 23, 1981, Amended in 1986. Accessed: October 22, 2021. Retrieved from: https://www.energy.gov/sites/prod/files/2018/06/f53/G-CEQ-40Questions.pdf

NDDOT (North Dakota Department of Transportation). 2019. *2019 North Dakota Crash Summary*. Accessed: June 2021. Retrieved from: https://visionzero.nd.gov/uploads/71/NDDOT_2019_Crash_Summary_hires_nobleed.pdf

USACE (U.S. Army Corps of Engineers). 2004. *Final Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act, as amended.* Accessed: October 2021. Retrieved from: https://usace.contentdm.oclc.org/digital/collection/p16021coll11/id/237

_____. 2016. *Environmental Assessment: Dakota Access Pipeline Project, Crossings of Flowage Easements and Federal Lands. Omaha, NE*. Accessed: January 14, 2021. Retrieved from: https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/2427

USFWS (United States Fish and Wildlife Service). 2007. *National Bald Eagle Management Guidelines*. Accessed: March 2020. Retrieved from: https://www.fws.gov/northeast/ecologicalservices/eaglenationalguide.html

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Acronyms and Abbreviations

Name	Description
°F	degrees Fahrenheit
µg/L	microgram per liter
µm	micrometer
ACHP	Advisory Council on Historic Preservation
ACS	American Community Survey
APE	area of potential effects
BA	Biological Assessment
bbls	barrels
BCC	Bird of Conservation Concern
BCR	Bird Conservation Region
BGEPA	Bald and Golden Eagle Protection Act
BMI	benthic macroinvertebrate
BMP	best management practice
BO	Biological Opinion
bpd	barrels per day
BTEX	benzene, toluene, ethylbenzene, and xylene
CAA	Clean Air Act
CBG	Census Block Group
CEJST	Climate and Economic Justice Screening Tool
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO2	carbon dioxide
CO2e	carbon dioxide equivalent
COVID-19	coronavirus disease 2019
CPM	Computational Pipeline Monitoring
CRST	Cheyenne River Sioux Tribe
CWA	Clean Water Act
Dakota Access	Dakota Access, LLC (Applicant)
DAPL Project	Dakota Access Pipeline Project
dBA	decibels of the A-weighted scale
DHC	dissolved hydrocarbon
DoD	U.S. Department of Defense
DOT	Department of Transportation
DRO	diesel range organic
EA	Environmental Assessment
EA-100	Equivalent Areas of 100 Percent Acute Mortality
ECP	Environmental Construction Plan
EIS	Environmental Impact Statement
EJI	Environmental Justice Index
EO	Executive Order

Name	Description
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning Community Right to Know Act
ER	Engineering Regulation
ERDA	Engineer Research and Development Center
ESA	Endangered Species Act
FBR	full-bore release
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FPIC	free, prior and informed consent
FRP	Facility Response Plan
g/ft2	grams per square foot
GHG	greenhouse gas
GIS	Geographic Information System
GRO	gasoline range organic
GRP	Geographical Response Plan
HAP	hazardous air pollutant
HCA	high-consequence area
HDD	horizontal directional drill
HUC	Hydraulic Unit Code
IMP	Integrity Management Program
IPaC	Information for Planning and Consultation
km	kilometer
km^2	square kilometer
LDS	leak detection system
Leq	equivalent sound level
Ldn	day-night sound level
MAOP	maximum allowable operating pressure
MBTA	Migratory Bird Treaty Act
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MHA	Mandan, Hidatsa, and Arikara Nation
mi^2	square mile
MLA	Mineral Leasing Act
mm	millimeter
MOP	maximum operating pressure
N/A	Not associated with Energy Transfer during the designated year
NAAQS	National Ambient Air Quality Standards
NCE	New Century Environmental
ND	North Dakota (used in context of highway names)
NDAC	North Dakota Administrative Code
NDDEQ	North Dakota Department of Environmental Quality
NDDOH	North Dakota Department of Health

Name	Description
NDPSC	North Dakota Public Service Commission
ND SHPO	North Dakota State Historic Preservation Office
NEPA	National Environmental Policy Act
NHI	National Heritage Inventory
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NO2	nitrogen dioxide
NOI	Notice of Intent
Northern Border	Northern Border Pipeline Company
NOx	nitrogen oxides
NRHP	National Register of Historic Places
NSA	noise sensitive area
NWI	National Wetlands Inventory
OSC	On-Scene Coordinator
OSHA	Occupational Safety and Health Administration
OSRO	Oil Spill Response Organization
PAH	polycyclic aromatic hydrocarbon
PHMSA	Pipeline and Hazardous Materials Safety Administration
PM10	particulate matter less than 10 microns
PM2.5	particulate matter less than 2.5 microns
psig	pounds per square inch gauge
Programmatic Agreement	*Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act*
Project	Lake Oahe crossing (The Dakota Access Pipeline crossing of federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota)
Project Area	The area directly impacted by the Lake Oahe crossing (temporary workspaces and permanent right-of-way)
Proposed Action	Grant an easement for the Lake Oahe crossing without modifications to the original easement conditions (2017 easement)
Regional Contingency Plan	*Federal Region 8 Regional Contingency Plan*
RFFA	reasonably foreseeable future action
RP	Responsible Party
RV	recreational vehicle
RWD	Regional Water District
SACP	Sub-Area Contingency Plan
SCADA	supervisory control and data acquisition
SERC	State Emergency Response Commission
SHPO	State Historic Preservation Office
SIMAP	Spill Impact Model Application Package
SO2	sulfur dioxide
SOP	*U.S. Army Corps Of Engineers* [Standard Operating Procedure] *SOP Response Procedures for Discovery of Human Skeletal Remains*

Name	Description
SRST	Standing Rock Sioux Tribe
SPCC	Spill Prevention, Control, and Countermeasure
SVI	Social Vulnerability Index
SWPPP	Stormwater Pollution Prevention Plan
TCJ	Tribal Code of Justice
TCP	Traditional Cultural Property
TERC	Tribal Emergency Response Commission
THC	total hydrocarbon concentration
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Load
UDP	*Unanticipated Discoveries Plan Cultural Resources, Human Remains, Paleontological Resources and Contaminated Media*
USC	United States Code
USDA	U.S. Department of Agriculture
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGCRP	U.S. Global Change Research Program
USGS	U.S. Geological Survey
VOC	volatile organic compound
WCD	worst-case discharge
WMA	Wildlife Management Area
WNS	northern long-eared white-nose syndrome

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1. INTRODUCTION AND BACKGROUND

Dakota Access, LLC (Dakota Access) previously constructed over 1,100 miles of crude oil pipeline to 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, known as the Dakota Access Pipeline Project (DAPL Project). The operator of the DAPL Project is DAPL-ETCO Operations Management, LLC. A portion of the DAPL Project required crossing federal flowage easements near the upper end of Lake Sakakawea north of the Missouri River in Williams County, North Dakota, and federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota. As is discussed below, this document focuses on the Dakota Access Pipeline crossing of federally owned lands at Lake Oahe (the Project).

In accordance with the National Environmental Policy Act (NEPA) and its implementing regulations, on July 25, 2016, the U.S. Army Corps of Engineers (USACE) Omaha District issued an Environmental Assessment (2016 EA) to evaluate the potential effects of granting permission under Section 14 of the Rivers and Harbors Act of 1899, codified in Title 33 United States Code (USC) Section 408 (Section 408), to Dakota Access for the crossing of federal real property interests administered by the USACE Omaha District. Section 408 permission requires a determination that the requested project is not injurious to the public interest and will not impair the usefulness of a USACE project. On July 25, 2016, the USACE granted permission under Section 408 to Dakota Access, as supported by a Finding of No Significant Impact based on the 2016 EA (USACE, 2016). Separate USACE authorizations were granted under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act along the entire DAPL Project route, including the Section 10 verification for Lake Oahe.

On February 8, 2017, the USACE granted an easement with conditions under the Mineral Leasing Act (MLA), 30 USC § 185, for the crossing of a portion of the Lake Oahe Project[1] in North Dakota. The easement allowed for the installation, construction, operation, maintenance, repair, replacement, and termination of a 30-inch-diameter horizontal directional drilled (HDD) oil pipeline for the purpose of transporting crude oil, and related facilities, at and under Lake Oahe and the Lake Oahe Project, with a 50-foot width plus the ground occupied by the pipeline and related facilities.

As explained below, the entirety of the DAPL Project is not subject to review in this Environmental Impact Statement (EIS). For background context, the North Dakota Public Service Commission (NDPSC) was the primary permitting authority for the DAPL Project within the State of North Dakota. The NDPSC's review spanned 18 months, from December 2014 through May 2016, and considered the environmental, health, recreation, soil, water resources, wildlife, and cultural and historic preservation consequences of the DAPL Project as part of its decision making, as well as numerous alternative routes and transportation technologies. The NDPSC's process provided multiple opportunities for public input, including three public hearings where all who wanted to testify were allowed to do so without time

[1] The Lake Oahe Project is part of the chain of Missouri River main stem lakes authorized in the Flood Control Act of 1944. The Lake Oahe Project consists of the Lake Oahe reservoir and the Oahe Dam, which were congressionally authorized to provide flood control, hydroelectric power, navigation, irrigation, fish and wildlife enhancement, municipal water supply, water quality, and recreational opportunities to the residents of North and South Dakota.

restriction, generating over 30 hours of testimony. NDPSC's process concluded with issuance of the Certificate of Corridor Compatibility and Route Permit, and approval of the pipeline in its current location. Numerous federal, state, and local approvals were also issued for the DAPL Project.

In September 2016, Dakota Access began construction of the pipeline across Lake Oahe. Drilling activities occurred between December 1, 2016, and December 4, 2016, and between January 20, 2017, and March 22, 2017, but drilling under Lake Oahe did not occur until after February 8, 2017. All facilities associated with the Lake Oahe crossing were designed, constructed, tested, and will be operated and maintained in accordance with the U.S. Department of Transportation regulations in Title 49 Code of Federal Regulations (CFR) Part 195. Dakota Access developed Project-specific plans that detail best management practices (BMPs) that were followed to mitigate construction-related impacts associated with stormwater runoff. This included implementation of their Stormwater Pollution Prevention Plan (SWPPP; Appendix A of the EA [USACE, 2016]), which includes a Spill Prevention Control and Countermeasure Plan (SPCC Plan).

As is displayed on Figure 1-1, the specific area impacted by the Applicant Proposed Action (referred to hereafter as the "Project Area") under consideration in this analysis includes:

- Orange hashed polygons indicating the real estate interests (federal lands) that the USACE has on the upper end of Lake Oahe.
- A straight solid red line indicating the pipeline beneath USACE-managed federal surfaces being considered as part of the federal action to issue a real estate easement.
- A yellow polygon indicating workspace outside of federal control and jurisdiction that directly supported the installation of the pipeline underneath the river/reservoir. Temporary activities that occurred in this workspace include welding together pipe and inspecting and testing the pipeline to ensure no leaks were present prior to preparing to install beneath the river/reservoir at both locations. The HDD operations also began and ended within this workspace.

Dakota Access constructed the pipeline across Lake Oahe and the areas under federal control using the HDD method. A detailed description of construction is provided in the 2016 EA. In general, the HDD method allowed for pipeline construction beneath Lake Oahe without the excavation of a trench by drilling a hole far below conventional pipeline depths and pulling the pipeline through the pre-drilled hole. As described in subsequent sections of this document and in greater detail in the *Directional Drill Plan of Procedure* (Appendix A), by utilizing this trenchless technology, Dakota Access minimized impacts on resources within and adjacent to Lake Oahe and reduced the duration of crossing construction compared to traditional open cut crossing methods. Compared to the excavation of a trench, employing the HDD method also lowered the risk of future incidents because it enabled Dakota Access to bury the pipe deeper on both sides of the riverbank, which provides greater protection from floods and high water levels. A cross section diagram of the Lake Oahe HDD is depicted on Figure 1-2.

Project Centerline
Standing Rock Sioux Tribe Reservation
Workspace
USACE Federal Lands

1:32,000
0 1,000 2,000 Feet

Figure 1-1: Applicant Proposed Action Area
Dakota Access Pipeline Lake Oahe Crossing Project
Morton County and
Emmons County, North Dakota

ERM

REVISED: 07/12/2021 | SCALE: 1:32,000

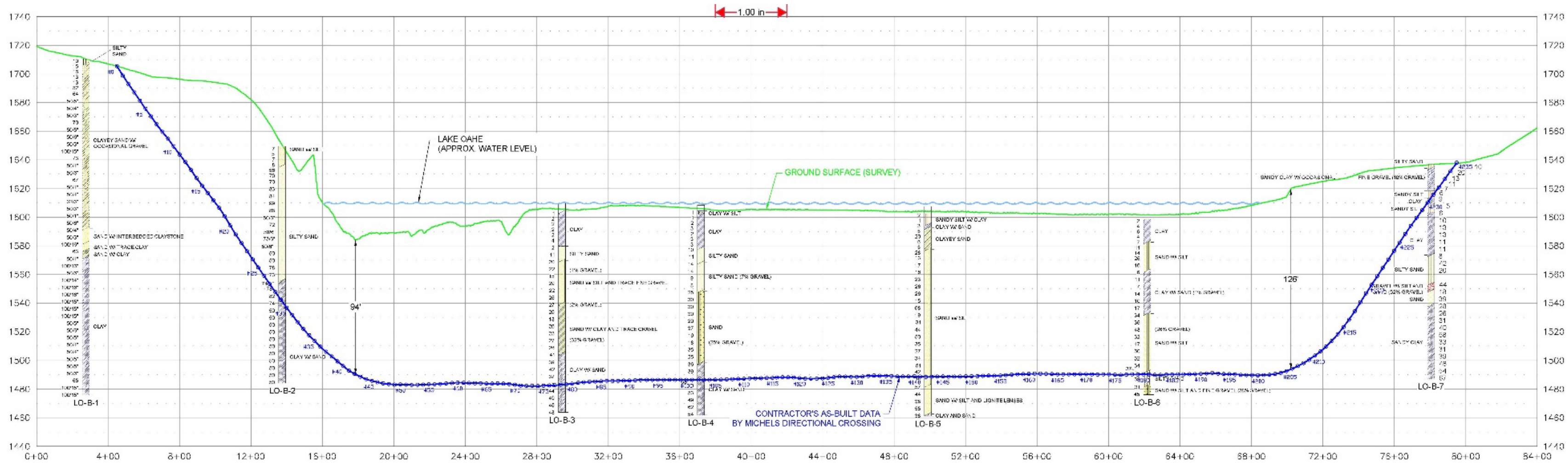

Figure 1-2: Cross Section of Lake Oahe Crossing

An intersect drill technique was utilized for the HDD installation. Two drill rig engines were used on each side of the drill. In addition, hammers were used to drive in casing on either side of the drill. To help guide the drill bit along the pipeline right-of-way, electric-grid guide wires were temporarily laid along the predetermined HDD route. In thickly vegetated areas, a small path was cut to accommodate laying the electric-grid guide wires. Once the electric-grid guide wires were installed, Dakota Access used directional drilling rigs on each side of Lake Oahe to drill a small diameter pilot hole along the prescribed profile from each side to the pre-selected intersection point. Following completion of the pilot hole, reaming tools enlarged the hole to accommodate the pipeline diameter. The reaming tools were attached to the drill string at the exit point (western side of the crossing) and were then rotated and drawn back to incrementally enlarge the pilot hole. During this process, drilling fluid, consisting of primarily bentonite clay and water, was continuously pumped into the pilot hole to remove cuttings and maintain the integrity of the hole. When the hole was sufficiently enlarged, a prefabricated segment of pipe was attached behind the reaming tool on the exit side of the crossing and pulled back through the drill hole toward 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 an "inadvertent return" or "frac-out." At more than 90 feet underground, the depth of the HDD profile below the bed of Lake Oahe and the land surface minimized the potential for frac-outs to occur. Additionally, precautions were taken during all phases of the drilling operation, including the use of a high-quality drilling fluid to maintain and protect the integrity of the borehole during the entire HDD operation until the final pipe pull was completed. Additionally, Dakota Access implemented their *Directional Drill Plan of Procedure* (Appendix A) for inadvertent release of drilling mud during HDD construction work at waterbody crossings to protect sensitive resources from such releases.

No inadvertent returns (frac-outs), hazardous material releases, issues with erosion/stormwater runoff, or other incidents that impact natural resources occurred in the Project Area during HDD operations for the installation of the pipeline. Some scoping comments expressed concern that a release of drilling mud did occur. The referenced release occurred outside the Lake Oahe crossing workspace and outside the Project Area at an off-site upland disposal location for HDD drilling mud utilized by a construction contractor. The release was not an inadvertent return (frac-out) during drilling activities. The mud was trucked out from the HDD location to the disposal site where a temporary berm was constructed to retain the material until it dried out. There was a documented breach in this berm during the disposal activity, but the material did not leave the disposal property and did not reach any waterbody. The area was stabilized, and additional erosion control measures were installed to prevent any further unintended migration of the material. There were no inadvertent returns (frac-outs) or releases within the Project Area or into Lake Oahe during the HDD of the Project.

The potential for geomorphological changes associated with water erosion and scour were considered when selecting the pipeline crossing method and location across Lake Oahe. Dakota Access coordinated with the North Dakota Department of Water Resources as part of the Sovereign Lands Permitting Process.

The North Dakota Department of Water Resources developed an internal depth-of-burial of a pipeline policy in 2016, formalized in 2017, for pipelines transporting certain hazardous materials beneath navigable waters of the state. That policy prescribes a minimum depth of cover of site-specific total calculated scour plus 4 feet from the bed of a river to the top of a pipe.

GeoEngineers, a professional engineering firm specializing in trenchless pipeline installation techniques, collected boring samples to evaluate the preferred HDD depths for the Project and performed a scour analysis in order to evaluate the scour risk to the proposed pipeline during 100- and 500-year release events. GeoEngineers determined total calculated scour for this crossing location to be 20 feet. Applying the North Dakota Department of Water Resources' depth-of-burial policy required a minimum of 24 feet of cover between the bed of Lake Oahe and the top of the pipe.

The North Dakota Department of Water Resources reviewed and concurred with the results of the scour analysis and on April 1, 2016, issued Sovereign Land Permit No. S-1951 for the Project (Appendix M of the 2016 EA [USACE, 2016]). Dakota Access constructed the pipeline via HDD between approximately 95 and 126 feet beneath the bed of Lake Oahe, exceeding the minimum depth of cover required by the Department of Water Resources by at least 71 feet.

Disturbed areas were limited to onshore areas in the entry and exit sites and pull-back areas. Excavation occurred on each side of the crossing to connect the HDD pipeline to the DAPL Project pipeline. Following construction, workspaces were restored to pre-construction contours as closely as practicable, following pipeline installation. Construction debris and organic refuse unsuitable for distribution over the construction right-of-way were disposed of at appropriate facilities in accordance with applicable regulations. Permanent Erosion Control Devices were installed as appropriate, and revegetation measures were applied in accordance with the Environmental Construction Plan (ECP; Appendix G of the EA [USACE, 2016]), SWPPP, and requirements of applicable state and federal permits.

Operation of the pipeline began on June 1, 2017. A 50-foot-wide permanent easement that is generally centered on the pipeline (25 feet on either side of the centerline) has been retained along the pipeline route. The 50-foot-wide easement is maintained to facilitate inspection of the pipeline, operational maintenance, and compliance with the federal pipeline safety regulations.

Vegetation management on USACE federal property as part of ongoing maintenance has not occurred to date. Selective tree cutting or periodic mowing or use of herbicides would not occur on USACE federal land without prior approval from USACE.

Following issuance of the 2016 EA and during construction, the Standing Rock Sioux Tribe (SRST), Cheyenne River Sioux Tribe (CRST), Oglala Sioux Tribe, and Yankton Sioux Tribe filed multiple lawsuits against the USACE. On June 14, 2017, the U.S. District Court for the District of Columbia (District Court) directed the USACE to reconsider three sections of the 2016 EA (known as the Remand) to consider whether the Project's effects were likely to be "highly controversial," the impact of a hypothetical crude oil release on the Tribes' fishing and hunting rights, and the environmental justice effects of the Project. These three areas are addressed throughout the analysis in this EIS, but particularly in Section 3.7, Cultural Resources, and Section 3.8, Socioeconomics, Environmental Justice, and Health. The USACE considered the Remand issues and evaluated additional information, including comments and concerns expressed by the Tribes regarding the data and methodologies used in the 2016 EA, completing the "Analysis of the Issues Remanded by the U.S. District Court for the District of Columbia Related to the Dakota Access Pipeline Crossing at Lake Oahe" (Remand Analysis) on August 31, 2018.

The USACE ultimately concluded that a formal reconsideration of the 2016 EA or preparation of supplemental NEPA documentation was not required.

Following the Remand Analysis, the Tribes moved for summary judgment stating that the Remand Analysis failed to resolve the NEPA deficiencies. On March 25, 2020, the District Court in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, 440 F. Supp. 3d 1, 26 (D.C. Cir. 2020) ordered the USACE to prepare an EIS for this portion of the pipeline because the pipeline's "effects on the quality of the human environment are likely to be highly controversial." This holding was affirmed by the District of Columbia Circuit Court.

On July 6, 2020, the District Court vacated the easement for the Lake Oahe crossing and ordered the DAPL Project operation shut down by August 5, 2020. However, on August 5, 2020, the U.S. Court of Appeals for the District of Columbia Circuit ordered a stay of the injunction that ordered Dakota Access to shut down the DAPL Project. On January 26, 2021, the Court of Appeals reversed the District Court's order to the extent it directs the pipeline be shut down, while affirming vacatur of the easement. The District Court case was dismissed on June 22, 2021. The USACE received many comments on the Project stating that Dakota Access should be required to stop operation of the pipeline until a thorough EIS is completed, all required permits are obtained, and litigation is complete. Whether Dakota Access should continue to operate the pipeline during preparation of this EIS is outside the scope of this EIS. This EIS focuses on whether a new easement can be issued under the MLA for the DAPL Project to cross USACE-managed federal lands at Lake Oahe.

1.1. Applicant Proposed Action—Granting an Easement at Lake Oahe

Before discussing the Applicant Proposed Action, it is beneficial to provide clarity on the terminology that will be used in this EIS and that is used in NEPA implementing regulations. The "proposed action" is not necessarily the action that the USACE will decide to take. The "proposed action" is instead the action that the USACE is reviewing and analyzing alternatives to in the EIS. The terms "proposed action" and "preferred alternatives" when used in EIS documents can be confused, so these terms are covered in the Council on Environmental Quality's (CEQ) Memorandum to Agencies *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulation* (CEQ, 1981). CEQ explains that "The 'proposed action' may be, but is not necessarily, the agency's 'preferred alternative.' The proposed action may be a proposal in its initial form before undergoing analysis in the EIS process." This is particularly true when an agency is responding to an application from a non-federal entity for a permit. In these circumstances, the proposed action is often what the applicant proposes or is seeking permission to do. According to CEQ, the preferred alternative "is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors." Further, "the agency may decide at the Final EIS stage, on the basis of the Draft EIS and the public and agency comments, that an alternative other than the proposed action is the agency's 'preferred alternative'." As the USACE did not internally generate the Project and is responding to an application for an easement across its land from Dakota Access, the proposed action presented in this EIS is based on Dakota Access' proposal and is therefore referred to as the Applicant Proposed Action. The USACE has not selected a preferred alternative in this Draft EIS and will make a selection in the Final EIS upon consideration of all public and agency comments.

The DAPL Project originates near Stanley, North Dakota, traversing west to the northwest of Williston and then turning south, crossing the Missouri River and traversing southeast across the State of North Dakota, exiting the state through the central portion of the southern state-line with South Dakota. Most of the entire pipeline crosses private lands. The Applicant Proposed Action includes the USACE granting an easement and the continued operation of the portion of the DAPL Project that crosses Lake Oahe (the Project) on USACE-administered lands consistent with the terms and conditions of the February 8, 2017, easement.

The Project is located at the border between Morton and Emmons counties, approximately 0.55 mile north of the northern exterior boundary of the SRST Reservation. The specific area impacted by the Applicant Proposed Action (i.e., the Project Area) is defined as the pipeline crossing at Lake Oahe and the portions of pipeline that extend approximately 911 feet east of the lake's east bank and approximately 1,138 feet west of the lake's west bank (Figure 1-1)—none of which crosses into the SRST Reservation. Approximately 1,103 feet (0.21 mile) of the pipeline in the Project Area passes beneath surfaces designated as USACE federal lands. These lands are real estate interests; specifically, the federal lands that the USACE owns and manages.

The 30-inch-diameter pipeline was routed to parallel existing linear infrastructure (an overhead powerline and a buried natural gas pipeline) in this area. The HDD design reflects a crossing length of approximately 7,500 feet, of which approximately 5,420 feet occurs beneath the bed of Lake Oahe. The crossing is located in Section 10, Township 134 North, Range 79 West in Morton County, North Dakota; and Section 11, Township 134 North, Range 79 West in Emmons County, North Dakota (Figure 1-1).

Figure 1-1 depicts the Project centerline, construction workspace areas that were used, USACE federal lands, and the SRST Reservation.

Construction workspace areas were also used in support of the HDD installation of the pipeline. Temporary construction activities that occurred in these workspaces included pipeline welding and hydrostatic testing of the pipeline to confirm no leaks were present prior to installation beneath the lake. Impact evaluations in temporary workspace areas are included in this EIS and considered part of the Project Area, as actions completed here were directly connected to the ability of Dakota Access to complete the HDD crossing of Lake Oahe.

Some actions that occurred outside the USACE federal lands at the Lake Oahe crossing are considered Connected Actions. Connected Actions are those actions that are "closely related and should be discussed in the same impact statement" (40 CFR § 1508.25 (a)(1)).[2] Actions are connected if they automatically trigger other actions that may require an EIS; 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)(1)(i-iii)). Connected Actions are limited to actions that are currently proposed (ripe for decision). Actions that are not yet proposed are not Connected Actions but may need to be analyzed in the cumulative effects analysis if they are reasonably foreseeable. The only Connected Actions associated with the Applicant Proposed Action are the permanent easement on private lands in the vicinity of the Lake Oahe crossing. The HDD entry and exit

[2] All 40 CFR Parts 1500–1508 citations used throughout this EIS are to the 2019 regulations.

site workspaces and pull-back area were located on private land outside of the federal lands and are considered Connected Actions in this analysis and have therefore been included in the Project Area.

The Project Area analyzed within this EIS is outlined in Table 1.1-1, which identifies land status (private or federal) and provides associated acreages. Neither the pipeline nor the Project Area directly crossed tribal lands, but the SRST's Reservation northern exterior boundary is less than 1 mile from the Lake Oahe crossing location and is considered in this EIS for effects from construction, operation, and maintenance of the Project.

Table 1.1-1: Project Areas

Action/Activity	Land Ownership	Acres
Federal Lands and Connected Actions—Morton County		
HDD workspace (exit point) on private land	Private	1.2
HDD pull-back area on private land	Private	13.1
Permanent easement over HDD profile on private land between HDD workspace (exit point) and federal lands	Private	0.8
Permanent easement over HDD profile on federal lands	Federal	0.4
Federal Lands and Connected Actions—Emmons County		
Permanent easement over HDD profile on federal land	Federal	0.8
Permanent easement over HDD profile on private land between federal land and HDD workspace (entry point)	Private	0.3
HDD workspace (entry point) on private land	Private	1.2
Lake Oahe		
Permanent easement over HDD profile across Lake Oahe	State	6.3

HDD = horizontal directional drill

The USACE received comments stating that eminent domain should not be used to acquire land not controlled and funded by the government, and should not be used for projects that benefit corporations over people. Dakota Access did not use eminent domain to acquire lands associated with the Project and the crossing of Lake Oahe. The use of eminent domain to acquire lands on the rest of DAPL outside the Project Area was not within the jurisdiction of the USACE.

Many commenters noted that a pumping station is under construction and that Dakota Access has plans to expand the capacity of the DAPL Project. Commenters stated that all construction should stop and any activity associated with this expanded capacity, referred to as the Optimization Project, should be included in this EIS. The U.S. Environmental Protection Agency (EPA) requested that the EIS identify the decision process for any capacity increases, along with the public involvement process. The USACE is analyzing the impacts of increased capacity in this EIS and will not make a decision on whether to grant an easement for an increased volume until the environmental review process is complete.

Construction activities and facilities associated with the Optimization Project are not within the Project Area and are not within the scope of this EIS. The original DAPL Project capacity was at least 570,000 barrels per day (bpd). The NDPSC has approved the construction of a pump station following analysis and input from experts and the public. When fully constructed, the Optimization Project would allow for up to an additional 530,000 bpd to be transported through the pipeline across federal lands and under Lake Oahe once modifications to the pipeline are complete. None of the physical modifications required to accomplish the increase in capacity take place on or within the Project Area, and therefore are not analyzed as direct or indirect effects. However, these facilities are addressed as cumulative effects when they occur within the geographical scope of applicable resource areas. Therefore, this EIS addresses the operational impacts associated with the additional volumes of crude oil that could be transported within the Project Area associated with the Optimization Project, for a total of up to 1,100,000 bpd.

With respect to increases in capacity, each state that the DAPL Project crosses has the authority to review and determine whether there is a public need and whether to grant any authorization for the pipeline to increase capacity. Each state's process may include opportunity for public input. The USACE's authority in the current review is limited to whether to grant an easement across its federal lands, which includes an evaluation of the impacts that would occur from the volume of oil transported should a crude oil release occur. The easement that the USACE is evaluating in this EIS does not include other facilities outside of the Lake Oahe crossing. Should Dakota Access seek to transport additional volumes beyond the 1,100,000 bpd, it would need to seek approval from the USACE for a revised easement. Any such revision may require an applicable NEPA analysis with public involvement.

1.2. Purpose and Need

Because the Project crosses Lake Oahe and the associated USACE-managed real estate, the Project would require an easement under the MLA, 30 USC § 185. The USACE is responsible for evaluating applications and for granting an easement under the MLA. Because an easement had previously been granted and the pipeline constructed, the USACE must consider whether a new easement can be issued that will allow the pipeline to remain, and if so under what conditions, or be abandoned, and if so whether to abandon by removal or in place. As such, the USACE is the lead federal agency for the preparation of an EIS for this Project in compliance with the requirements of NEPA and the CEQ regulations for implementing the procedural provisions of NEPA (40 CFR Parts 1500–1508).

The purpose and need for this EIS is to evaluate whether a new easement can be issued under the MLA for the DAPL Project to cross USACE-managed federal lands at Lake Oahe. This evaluation considers the Project purpose of the Applicant Proposed Action to be the purpose of the DAPL Project (to transport up to 1,100,000 bpd from the Bakken and Three Forks production region in North Dakota to a crude oil market hub located near Patoka, Illinois, and ultimately to refineries located in the Midwest and the Gulf Coast), but the analysis is limited to effects of allowing the pipeline to cross federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota (the Project). The original proposed capacity of the pipeline was at least 570,000 bpd. However, since the pipeline was built in 2016 and began operating in 2017, it has received additional permissions from, or provided notifications to, states along the pipeline route to increase capacity to 1,100,000 bpd. This updated volume is considered in this EIS. The federal action is to determine whether the USACE may grant an easement for Dakota Access to place the pipeline on federal real property interests acquired and managed by the USACE for the Lake Oahe Project (the Applicant Proposed Action).

1.3. Authority and Scope of EIS

The pipeline's crossing of USACE federal lands at Lake Oahe requires an easement under the MLA, 30 USC § 185, which is the federal action associated with this EIS. The scope of this EIS is limited to the crossing of USACE federal lands at the Lake Oahe crossing, which would require real estate actions by the USACE. As noted above, separate USACE verifications and approvals were obtained for Section 404 and Section 10 crossings along the entire DAPL Project route. Those additional verifications and approvals are still in place and are not subject to review as part of the EIS process.

Under the MLA, the USACE as the agency with authority to grant an easement under Lake Oahe must consider what is required to control or prevent damage to the environment, damage to public or private property, hazards to public health and safety, and impose measures to protect the interests of individuals living in the general area who rely on natural resources for subsistence (30 USC § 185(h)(2)), as well as requirements that protect from sudden ruptures and slow degradation of the pipeline (30 USC § 185(g)). Further, the USACE will examine the requested easement under USACE's Non-Recreational Outgrant Policy, USACE Engineering Regulation (ER) 1130-2-550. Under this policy and the MLA, the USACE will provide federal, state, and local governments, as well as the public, the opportunity to comment on the easement application (30 USC § 185(k)); determine whether the applicant has the technical and financial capability to construct, operate, maintain, and terminate the project for which the permit or right-of-way is requested (30 USC § 185(j)); consider state standards for pipeline construction where the right-of-way crosses federal and non-federal lands, and where the state standards for pipeline construction are more stringent than federal standards, the former will be required (30 USC § 185(v); ER 405-1-12, para. 8-182c.(8)); utilize easements in common with other pipelines to the extent practical (30 USC § 185(p)); and determine whether the proposed easement will not be inconsistent with the authorized purposes of the federal project (30 USC § 185(b)(1)).

In the event an easement is issued under the MLA, that statute also requires the USACE to consider adding special requirements to the easement needed for safe operation of the pipeline or related facilities or stipulations to prevent or control damage to the environment, including fish and wildlife habitat, damage to public or private property, and hazards to public health and safety; and require restoration, revegetation, and curtailment of erosion of the surface of the land are appropriate (30 USC § 185(h)(2); ER 1130-2-550, para. 17-5), limit the term of the easement to no more than 30 years (30 USC § 185(n)), include in the easement language about suspension or termination of the easement, and if deemed necessary, the USACE may at its discretion require the holder of a license or right-of-way to furnish a satisfactory bond or other security for all or any of the obligations imposed by terms and conditions of the license, right-of-way, or regulations.

This EIS has been prepared in accordance with CEQ regulations (40 CFR Parts 1500–1508), ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements. On July 16, 2020, the CEQ finalized new regulations implementing NEPA, which took effect on September 14, 2020. Commenters requested that this EIS be prepared under the previous NEPA regulations. Because this EIS review was initiated prior to the 2020 regulations taking effect, this EIS has been prepared using the previous regulations. Also on April 20, 2022, the CEQ issued a final rule amending the NEPA regulations to generally restore provisions that were in effect prior to the 2020 NEPA regulation changes.

Several commenters inquired whether the USACE is using Executive Order (EO) 13927, *Accelerating the Nation's Economic Recovery From the COVID-19 Emergency by Expediting Infrastructure Investments and Other Activities* (85 Fed. Reg. 35165), to expedite its decision making for this Project.[3]

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[3] EO 13927 was issued by President Trump on June 4, 2020.

On January 20, 2021, President Biden issued EO 13990 on *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (86 Fed. Reg. 7037), revoking EO 13927.

As the lead federal agency, the USACE published a Notice of Intent (NOI) in the Federal Register (85 Fed. Reg. 176 [September 10, 2020]) to advise the public that the USACE will prepare an EIS and open the public scoping period to identify issues and reasonable alternatives to the Applicant Proposed Action. In addition to the NEPA requirements, granting of the easement for the Applicant Proposed Action shall comply with the National Historic Preservation Act (NHPA; Section 106) and the Endangered Species Act (ESA). Further, Tribes, Tribal Historic Preservation Offices (THPOs), State Historic Preservation Offices (SHPOs), the Advisory Council on Historic Preservation (ACHP), and interested parties were consulted with by USACE Omaha District personnel as required through their *Programmatic Agreement for the Operation and Management of the Missouri River Main Stem System for Compliance with the National Historic Preservation Act* (USACE, 2004; Programmatic Agreement) with Tribes that reside within the Missouri River Basin and other applicable laws, regulations, and guidance.

This analysis is being completed in accordance with CEQ regulations in 40 CFR § 1506.5(c), which direct the lead agency or a contractor selected and directed by the lead agency to prepare an EIS. The USACE will make a final determination regarding compliance of the activities with NEPA and MLA with the completed information contained herein. Although the USACE engaged a contractor to assist in the development of this EIS, the USACE independently evaluated and verified the information and analysis undertaken in this EIS. Further, the USACE's Engineer Research and Development Center (ERDC) performed an independent review of the modeling analysis, and the USACE Omaha District requested a team of USACE staff outside of the Omaha District to review the entire EIS. The USACE takes full responsibility for the scope and content contained within.

Many commenters expressed concern that the USACE would reiterate the 2016 EA or use it as a basis for this EIS analysis, as the court found the 2016 EA deficient. Commenters were also concerned with the preparation of the 2016 EA because Dakota Access prepared the 2016 EA on behalf of the USACE, which is permitted for environmental assessments under 40 CFR § 1506.5 but not environmental impact statements. While this EIS was developed in consideration of the 2016 EA and includes references to information from that document, the USACE performed additional analysis and independent research, and received supplemental information from Dakota Access through data request responses, cooperating agencies (EPA, U.S. Fish and Wildlife Service [USFWS], State of North Dakota, and the CRST), and Tribes through government-to-government consultation (e.g., the SRST and Oglala Sioux Tribe), to update and expand the analysis on affected resources, revised regulations, and impacts.[4] Assumptions made in the 2016 EA are therefore not carried through to this EIS, which provides a fresh analysis of the facts and data necessary for the USACE to make a decision.

Further, commenters expressed concern that the 2016 EA and its analysis is obsolete because the volume of oil analyzed in the 2016 EA alternatives was 570,000 barrels per day, and this EIS analyzes alternatives with a volume of oil of 1.1 million barrels per day. This EIS uses updated data, analysis, and

[4] This EIS follows National Environmental Policy Act (NEPA) regulations prior to the Council of Environmental Quality's July 2020 withdrawal of the rule updating the NEPA regulations at 40 CFR Parts 1500–1508.

information based upon the optimized volume of 1.1 million barrels per day, as is reflected in the updated appendices attached hereto. While many commenters supported the preparation of an EIS for the Project, some commenters disagreed and stated the past 2016 EA was robust and requires no further analysis. Regardless, the District Court ordered the USACE to prepare an EIS, and the USACE is doing so. Further, the USACE acknowledges the District Court's order, and preparation of this EIS satisfies the NEPA regulations 40 CFR § 1508.27(b)(4).

Commenters requested that the EIS establish a baseline for the current affected environment and include an evaluation of impacts associated with the construction that has already occurred from the Project, along with any ongoing maintenance activities. As is described in Chapter 3, Affected Environment, Impacts, and Mitigation, of this EIS, impacts on resource areas are addressed by first identifying the background or existing conditions as they were in 2016 (pre-construction) along with the impacts that occurred from construction and operation to date. Then the EIS identifies the current conditions or existing environment, and the impacts that would occur from five alternatives associated with any construction or operation of the Project moving forward.

The USACE also received comments during scoping that the scope of this EIS should include the entire DAPL Project and that focusing the scope of the EIS to just the Lake Oahe crossing represents illegal segmentation of the project. On September 29, 2015, the U.S. Court of Appeals for the District of Columbia Circuit in *Sierra Club v. United States Army Corps of Engineers, et al.*, 803 F.3d 31 (D.C. Cir. 2015) ruled that NEPA did not require federal agencies authorizing portions of an interstate [oil] pipeline to conduct a "whole-pipeline" environmental review, and clarified an appropriate scope of NEPA review for pipeline construction projects where federal involvement is limited to granting authorizations for discrete aspects of the project. Further, in this case, the District Court only remanded that the analysis of the pipeline crossing federal lands at Lake Oahe be conducted through an EIS. As such, federal review of this Project is limited only to the impacts associated with construction and operation of the pipeline crossing of federal lands, the associated crossing under Lake Oahe, and adjacent and the defined Connected Actions (40 CFR § 1508.25(1)). However, the larger DAPL Project is considered within the cumulative effects analysis in Chapter 4, Cumulative Impacts, of this EIS where it falls within the geographic scope for a particular resource.

The SRST provided a letter through its THPO from Dr. Thomas King, which states that the area of potential effects (APE) used in the EIS should include direct, indirect, and cumulative effects (Appendix B). In particular, Dr. King discusses that direct effects include "but for" effects, or effects that would only occur if the Project is approved. Dr. King gives an example of this type of direct effect as a hypothetical ancient cemetery on farmland in Iowa that was disturbed by construction of the DAPL Project. Dr. King states that in this circumstance, the damage to the cemetery would not happen "but for" the USACE easement allowing the DAPL Project to cross the Missouri River. This line of reasoning urges that the USACE should consider all impacts from construction of any of the past DAPL Project activities in this EIS as a direct effect of the current Project.

In considering impacts, this EIS addresses direct, indirect, and cumulative impacts of the Project as defined by the NEPA regulations in 40 CFR § 1508.8. These regulations define a direct effect as "caused by the action and occur at the same time and place." Per the regulations, indirect effects are "caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable." The "but for" argument has been used many times over the years in NEPA practice to argue causality for indirect effects. However, the courts have disagreed.

The question of whether effects that occur "but for" the proposed action has previously been reviewed by the Supreme Court. The Supreme Court explained, "a 'but for' causal relationship is insufficient [to establish cause for purposes of NEPA]"; further, effects that occur using the "but for" argument are not subject to NEPA if the causal chain is too attenuated." [5] The Court has also opined that "where an agency has no ability to prevent a certain effect due to its limited statutory authority over the relevant actions, the agency cannot be considered a legally relevant 'cause' of the effect."[6]

As described above, the Lake Oahe crossing required a Section 408 permit, which "applies to alterations proposed within the lands and real property interests identified and acquired for the Corps project." USACE defined the APE subject to the Section 408 review as jurisdictional lands and any immediate direct impacts associated with the pipeline crossing including all bore pits, stringing areas, staging areas and access routes, even though located outside USACE-managed land. Additionally, the remand directed USACE to conduct a more thorough NEPA review; it did not direct USACE to redefine the APE or reconsider its previous reasonable and good faith efforts to identify historic properties that could have been affected by the DAPL Project in order comply with Section 106 of the NHPA. The USACE had no statutory authority over much of the DAPL Project, and in this case the "but for" argument is too attenuated. Therefore, the "but for" effects are not included as direct or indirect effects of the Project.

Numerous commenters requested that this EIS address impacts from upstream production (e.g., fracking-induced earthquakes and pollution from mining tar sands). As stated above, the USACE jurisdiction is limited to a decision on whether to grant an easement for the crossing of federal lands adjacent to Lake Oahe. For this Project, the USACE has no role in the approval of the production of crude oil that will be transported by the DAPL Project, and such activities are located over 130 miles[7] from the Project Area. As such, impacts associated with crude oil production are considered beyond the scope of this EIS.

1.4. Demand for Oil and Necessity for the Project

Numerous commenters noted that demand for oil is declining, the United States no longer has a need for oil, that the United States is in a climate crisis, and the USACE should reconsider the need for the Project. Some commenters also stated that the DAPL Project shippers have alternative means to transport their oil supporting a lack of need for the Project. Instead, commenters urged the USACE to pursue renewable energy options that are becoming cost competitive with fossil fuels. Some commenters stated that the crude oil to be transported by the DAPL Project does not serve a domestic need, is destined for export,

[5] *U.S. Department of Transportation et al. v. Public Citizen et al.*, 541 U.S. 752, 767 (2004) (*Pub. Citizen*) (quoting *Metropolitan Edison Co. v. People Against Nuclear Energy*, 460 U.S. 766, 774 (1983)).

[6] *Public Citizen*, 541 U.S. at 770. *See generally Tennessee Gas Pipeline Co., L.L.C.*, 169 FERC ¶ 61,230 (2019) (McNamee, Commissioner, concurrence [elaborating on the purpose of the NGA]).

[7] Based on the location of wells identified in the Homeland Infrastructure Foundation-Level Database (HIFLD, n.d.).

and therefore is not needed (e.g., the SRST cites an S&P Global blog article for volumes of Bakken crude oil that were exported in 2019 [Huchzermeyer and Tialios 2020]).

As a common carrier, Dakota Access does not control and is not aware of the ultimate destination or usage of crude oil transported on its pipeline. However, Dakota Access has indicated that there is more than adequate pipeline connected capacity serviced via the DAPL Project to domestically consume any increase in DAPL Project transported volumes. Additionally, DAPL Project volumes delivered to the Gulf Coast are refined domestically at a materially greater percentage compared to the national average for other key domestically produced crude grades.

The SRST provided two declarations to the District Court of Dr. Marie Fagan, chief economist at London Economics International, LLC, on the status of oil production in the United States and specifically the Bakken area in support of the projection of effects that a temporary closure of the DAPL Project (of 1 to 2 years) would have while the USACE prepares an EIS.[8,9] The SRST also provided a declaration to the District Court of Mr. Ian Goodman, President of The Goodman Group, Ltd., to provide analysis of the minimal effects of a shutdown of the DAPL Project.[10] Conversely, the NDPSC provided declaration of Lynn D. Helms, Director of the North Dakota Industrial Commission Department of Mineral Resources to the District Court regarding production levels in the State of North Dakota and forecasts from the U.S. Energy Information Administration to demonstrate that supply and demand is rebounding from early pandemic lows and supports the continued need for the DAPL Project.[11]

With respect to the demand or need for oil, state public utility commissions have been granted the authority to determine if there is a public need for oil, or to approve other renewable energy projects. Each state that the DAPL Project crosses approved the Project, finding a public need in 2016. Each state did so again in 2019 and 2020, granting authorizations for the pipeline to increase capacity to up to 1,100,000 bpd.[12] The overall need for oil in the United States or whether oil should be exported is beyond the scope of the USACE jurisdiction and this EIS. Although the USACE recognizes that renewable energy is becoming more cost competitive and is playing an increasing role in meeting U.S. energy

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[8] Declaration of Dr. Marie Fagan, May 5, 2020, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al*., United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-1796 and 17-cv-267).

[9] Second Declaration of Dr. Marie Fagan, October 16, 2020, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al*., United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-1796 and 17-cv-267).

[10] Declaration of Ian Goodman, August 7, 2017, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al*., United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-1796 and 17-cv-267).

[11] Declaration of Lynn Helms, April 19, 2021, in *Standing Rock Sioux Tribe; Yankton Sioux Tribe; Robert Flying Hawk; Oglala Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al*., United States District Court for the District of Columbia, Civil No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-01796 and 17-cv-00267).

[12] On January 12, 2022, the Illinois 4th District Appellate Court vacated approval of the expansion of the DAPL Project, remanding the decision back to the Illinois Commerce Commission. On September 15, 2022, the Illinois Commerce Commission again approved the expansion of the DAPL Project.

demands, the USACE's role in the Applicant Proposed Action is to respond to a permitting application. The USACE does not have the authority to direct Dakota Access to implement a renewable energy project.

Regarding the two declarations of Dr. Fagan provided by the SRST and their support for minor impacts that could occur related to a temporary closure of the DAPL Project, the USACE has reviewed them and compared their assumptions to actual events to determine whether to incorporate their analysis into the EIS. These declarations were developed in May and October 2020. The declarations state several assumptions of future conditions that do not reflect current conditions as they are now known, including: 1) there would be a temporary shutdown of 1 to 2 years while the EIS is prepared (from May 2020 through May 2022); and 2) crude oil prices, which were at about $30 per barrel in May 2020, and the report forecasts that those prices would not recover by 2022 to above $50 per barrel. The temporary shutdown period considered has passed, and the courts did not require a shutdown. According to the U.S. Energy Information Administration, the price of crude oil has seen a steady increase since early November 2020, reaching over $50 per barrel in early January 2021, above $70 per barrel in the second half of 2021, and above $100 per barrel from March 2022 through July 2022 (EIA, 2022). Unforeseeable events have occurred subsequent to the date of Dr. Fagan's declarations, most notably the war in Ukraine, affecting global oil demand and price. In addition, Dr. Fagan's declarations take a wide purview of the economics effects of a shutdown, assuming that nationwide oil production can make up any losses in North Dakota without any nationwide economic effect, but does not contain detailed analysis of any effects to the State of North Dakota.

Similarly, Mr. Helms' declaration includes forecasts that production will return to 2019 levels by the third quarter of 2022; but current production data reported by the North Dakota Industrial Commission Department of Mineral Resources shows that production leveled off in 2022 in between the lows seen in May of 2020 and the pre-pandemic levels of 2019 (North Dakota Industrial Commission Department of Mineral Resources, n.d.). Specifically, 2019 daily production levels in North Dakota ranged from a low of 1,336,664 bpd in February 2019 to a high of 1,519,035 bpd in November 2019, with a trend of steady increase in production levels. However, 2022 daily production levels (January through June) peaked at a high of 1,129,348 bpd in March 2022 and maintained an average of 1,069,398 bpd throughout 2022. The State of North Dakota provided an additional declaration to the USACE by Mr. Helms in 2023 noting that the U.S. Energy Information Administration forecasts global liquid fuels consumption and production will return to 2019 levels by the end of 2024 and that crude oil exports are at higher levels than before the pandemic.

Finally, Mr. Goodman's declaration was given in August 2017, shortly after the DAPL Project went into service. Mr. Goodman presents information on the state of the oil market in 2017 compared to 2014, noting crude oil prices are much lower (comparing prices of approximately $90 per barrel in 2014 to $40 in 2017) and that production has declined and stabilized (referencing average production of 1.2 million bpd in late 2014 to stabilizing around 1 million bpd in late 2016). Mr. Goodman states that production levels were expected to stay at this stabilized level for at least the short-term (although his definition of short-term is not provided). As with Dr. Fagan's projections, Mr. Goodman's projections have been reviewed in light of actual conditions and are not reflective of current conditions. The price of oil has fluctuated in light of the COVID-19 pandemic and subsequent recovery, the war in Ukraine, and other market factors dropping to $30 per barrel and increasing again to over $100 per barrel the first half of 2022 with projections for 2023 to average around $75 per barrel (EIA, 2023). Further oil production in North Dakota continued to climb to a peak of over 1.5 million bpd in late 2019. In light of the highly volatile nature of the market, projections and forecasts from over 6 years ago necessarily rely on assumptions that do not contemplate the significant market changes that have occurred in that time and are no longer relevant for use in this EIS.

As Dr. Fagan's, Mr. Helms', and Mr. Goodman's declarations and analysis were based on assumptions that have been superseded by actual data that contradict those assumptions, the outcomes predicted in their projections are inappropriate to rely upon for this EIS and are not considered further. While it is up to the NDPSC to determine whether there is a demand or need for oil or oil production in its state, the forecasts in Dr. Fagan, Mr. Goodman, and Mr. Helms' conflicting declarations when taken together highlight the unpredictability and rapidly changing landscape of oil prices and production, which emphasizes the volatility in this market. In addition, Dakota Access not only continues to pursue operating its existing oil pipeline but is also seeking an expansion of the volumes it is capable of flowing. Given Dakota Access' continued pursuit of the Project, the USACE finds it is necessary to analyze the effects of operating the Project using the full Project volumes, inclusive of Optimization. The USACE recognizes that Dakota Access may not always flow at its maximum capacity; however, the USACE must consider that the Project will be capable of transporting up to 1,100,000 bpd, and therefore evaluates impacts based on the full capacity of the Project.

1.5. SUMMARY OF PUBLIC OUTREACH AND COORDINATION

Public outreach and scoping activities began on September 10, 2020, when the USACE published an NOI to prepare an EIS (85 Fed. Reg. 176 [September 10, 2020]). The USACE received comments asking that public comment meetings be delayed and held after the COVID-19 pandemic is over, and the meetings be held in person. Commenters also requested options for individuals to speak and make comments. The USACE could not indefinitely delay the EIS process that has been court mandated until the end of the COVID-19 pandemic. However, the USACE used multiple avenues to make the public aware of the Project, including Federal Register notices, newspaper advertisements, and its website, and offered numerous options for providing comments, including holding virtual public scoping meetings, and accepting comments via mail, email, voicemail, and written chat features at virtual meetings. These options also accounted for circumstances where individuals do not have internet connectivity. The USACE sent letters on September 25, 2020, to non-governmental organizations, state and local organizations, and federal agencies, providing information about the scoping process and how to comment, see Appendix B for a copy of the letter.

The SRST expressed concerns that the scoping process was initiated prior to government-to-government consultation. The scoping process allows the lead agency to receive input from all stakeholders on the range of issues that should be addressed in the EIS. The USACE acknowledges the importance of engaging in government-to-government consultation early in the process; however, the NEPA process does not dictate when consultation needs to occur in relation to scoping. Since receiving the SRST's letter requesting consultation, the USACE has engaged in consultation and has worked to provide an open door to ongoing consultation by suggesting possible dates for government-to-government consultation with the Tribes as discussed in Section 1.5.1 below. Additionally, on September 25, 2020, the USACE sent letters to all Tribes included in the USACE Omaha District's Programmatic Agreement distribution list (signatories and nonsignatories), inviting participation in a tribal scoping meeting and offering government-to-government consultation (Appendix B). The USACE hosted a separate tribal scoping meeting during the scoping period on October 13, 2020. The timing of when scoping occurred for this Project remains legally valid, and as is discussed further below, several Tribes have participated in government-to-government consultation with the USACE.

1.5.1. Notices and Newspaper Advertisements

The USACE issued a series of notices in the Federal Register intended to keep the public informed about the EIS public scoping process.[13] The notices were also provided on the USACE's Project website (see Section 1.5.2 below).

In addition to the NOI, scoping coordination letters were sent to public entities, including individuals, agencies, Tribes, and others that may have an interest or previously had expressed interest in the Project. This letter was sent in September 2020 and invited participation in the public scoping process.

1.5.2. Website

The USACE developed a public website that was established at the time the NOI was published to communicate and share information about the EIS.[14] The website announced public scoping meeting dates, times, and locations in addition to providing all information shared during the public scoping meetings (e.g., meeting slides). The website provided a comment submission link to submit comments during the public comment period. Notices, documents, and upcoming public meeting information were available to the public through the website as well as links to the Administrative Record.

1.5.3. Scoping Meetings

Due to the COVID-19 pandemic, the Omaha District conducted two virtual public meetings on October 15 and October 16, 2020 via a live Facebook event. To facilitate the meetings, the USACE representatives read emails and questions submitted during the meeting to share comments and responses. Transcripts of these meetings were made available as part of the Administrative Record. In addition, the USACE has included all comments submitted via the comments section of the Facebook event as part of the Administrative Record.

1.5.4. Public Comment Period and Extension

The comment period was open from September 10, 2020, to October 26, 2020. Many commenters requested an extension of the comment period. On October 23, 2020, the comment period was extended to November 26, 2020. In addition to the public scoping meetings, comments were accepted via mail, email, and via phone message.

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[13] 85 Fed. Reg. 176 (September 10, 2020) and 85 Fed. Reg. 206 (October 23, 2020).

[14] www.nwo.usace.army.mil/Missions/Dam-and-Lake-Projects/Oil-and-Gas-Development/Dakota-Access-Pipeline/

The aim of the public comment period was to obtain comments on the following alternatives:

1. No Action Alternative, where the USACE would not grant an easement and would require restoration of the USACE-administered federal lands to pre-pipeline construction conditions;
2. The USACE would not grant an easement and would take no further action;
3. The USACE would grant the requested easement with the same conditions as the vacated easement; and
4. The USACE would grant the requested easement with additional conditions beyond those in the vacated easement.

As a result of the scoping process, a fifth alternative has been added to the analysis in this EIS (see Section 2.6.3, [Alternatives] Alternative 5: North Bismarck Reroute, of the EIS for additional information on the addition of this alternative):

5. Dakota Access would reroute a portion of the DAPL Project outside the Project Area using an alternative route. It is unknown exactly what route Dakota Access would seek to permit as a reroute, and any such reroute would require Dakota Access to go through permitting processes with any applicable permitting agency. However, to assess impacts of this alternative, the USACE is using the North Bismarck Alternative from the 2016 EA as a proxy. This alternative (herein referred to as the North Bismarck Reroute) would also require abandonment of the existing pipeline.

1.5.5. Comments

A total of approximately 49,200 submissions were received during scoping through a variety of methods (email, mail, voicemail, Facebook chat, etc.). Of those, approximately 47,000 were of several duplicative form letters and the remaining non-duplicative letters contained 2,800 unique comments. The comment submittals were provided by members of the public, Tribes, local and state governmental agencies, non-governmental organizations, and other stakeholders. The overwhelming majority of comments received focused on environmental justice, along with the purpose and need of the project, reliability and safety, and water quality. Many comments related to specific environmental resources focused on the impacts on the resource related to a crude oil release during operation of the Project. Public comments were received and summarized in a Scoping Report, which is included as Appendix C to this EIS. All comments received will be included in the Administrative Record for this Project. The Scoping Report also identifies where within this EIS the topics raised in comments are addressed.

The list of scoping comment topics is included below.

- NEPA Process
- Public Scoping Process
- General Support of EIS Development
- General Opposition to EIS Development
- Project Description/Scope of Analysis
- Purpose and Need
- Alternatives
- Geology and Soils
- Water Quality
- Water Supply
- Vegetation
- Wildlife

- Aquatic Species
- Threatened and Endangered Species
- Land Use
- Cultural Resources
- Tribal Interests, Resources, and Treaty Rights
- Subsistence
- Socioeconomics and Environmental Justice
- Safety Systems
- Hazardous Substances and Safety Assessment Methodology
- Financial Responsibility
- Greenhouse Gas Emissions and Climate Change
- Public Health

1.6. Federal, Tribal, State, and Local Agency Consultation and Coordination

The USACE sought cooperating agencies to assist in the development of this EIS based on areas of special expertise. The following describes the efforts and status of cooperating agencies:

- On February 11, 2021, the USACE invited the U.S. Department of Transportation Pipeline and Hazardous Materials Safety Administration (PHMSA) to become a cooperating agency in the preparation of an EIS for the Project. On April 1, 2021, PHMSA declined to become a cooperating agency but offered to provide technical expertise on pipeline safety and oil release response planning matters when requested.
- On February 17, 2021, the USACE invited the SRST, the CRST, the Oglala Sioux Tribe, and the Yankton Sioux Tribe to become cooperating agencies. On March 15, 2021, the SRST accepted the invitation. On March 16, 2021, the CRST and Oglala Sioux Tribe accepted the invitation. Following approximately 6 months of participation as a cooperating agency, on September 17, 2021, the Oglala Sioux Tribe withdrew from their role as a cooperating agency via tribal resolution number 21-204. Following approximately 10 months of participation as a cooperating agency, on January 20, 2022, the SRST withdrew from their role as a cooperating agency. Oglala Sioux Tribe and the SRST were privy to an early release of all scoping comments received, summary tables of scoping comments received, and working draft documents of the Scoping Report and Draft EIS during their time as cooperating agencies. The Yankton Sioux Tribe declined to become a cooperating agency.
- On April 2, 2021, the State of North Dakota requested to become a cooperating agency, and on June 23, 2021, the USACE accepted the state's offer.
- At the request of several Tribes participating as cooperating agencies, on August 13, 2021, the USACE invited the ACHP to become a cooperating agency. On August 26, 2021, the ACHP declined the USACE invitation because its purview is limited to matters relating to Section 106 of the NHPA, not NEPA.
- On August 13, 2021, the USACE invited the EPA and USFWS to become cooperating agencies, and on August 27, 2021, and August 31, 2021, the EPA and USFWS accepted these invitations, respectively.

The USACE hosted cooperating agency meetings on April 1, 2021, May 19, 2021, July 22, 2021, and November 9, 2021, to facilitate a kick-off call, coordinate on the review of public scoping comments received, and coordinate multiple reviews of the Draft EIS (including a cooperating agency review of preliminary versions of the Draft EIS in July 2021, November 2021, and February 2023). The USACE also provided an update to the cooperating agencies on the status of the Project in a meeting on August 17, 2022.

The State of North Dakota expressed concern that it has requested repeatedly to meet with the USACE as a cooperating agency and been denied, but that the Tribes have been able to schedule meetings and make changes to the scope of the EIS. The state is conflating different types of meetings. Several Tribes have requested and participated in government-to-government meetings, as described below. However, these meetings are separate and distinct from meetings or the Tribes' role as a cooperating agency. Regardless, cooperating agencies have been invited to participate in cooperating agency meetings and had access to the same materials throughout the review process. In addition, on October 1, 2021, the USACE held a meeting with the State of North Dakota to discuss their input as a cooperating agency in the development of the Draft EIS.

The USACE received comments stating that the treaty rights of Native Americans who live in the Project Area should be respected and that their voices and knowledge should be included in the process. As is discussed above and below, the USACE sought input from the Tribes through multiple avenues, including in scoping meetings and comments, as cooperating agencies in development of the EIS to provide technical support and knowledge in their areas of special expertise, and through government-to-government consultation. In particular, while participating as a cooperating agency, these Tribes were able to review all scoping comments submitted and received working drafts of the Draft EIS. The USACE also asked cooperating agency Tribes to provide input on the topics that the EIS should address and assist in developing the language in the EIS based on their areas of special expertise. Tribal representatives who participated in the cooperating agency meetings provided comments in English and their native languages. This input in native languages, translated to English by native speakers, helped improve communication by providing important traditional perspective and context to assist in helping non-native language speakers understand native viewpoints.

In a letter dated September 20, 2021, USACE provided information to the SHPO on the status of the Project and a summary of comments received to date from members of the public, Tribes, local and state government agencies, non-governmental organizations, and other stakeholders, and invited SHPO to participate in a meeting to discuss this information.

As part of development of this EIS, the USACE provided all Tribes within its Programmatic Agreement an early review and comment opportunity on a preliminary version of the Draft EIS.

1.6.1. Government-to-Government Consultation and Coordination

The USACE Omaha District recognizes that many Tribes have government-to-government consultation policies and the USACE strives to establish relationships that focus on successful communications and a collaborative process. Individual tribal government-to-government consultation requests are coordinated to ensure the USACE is fulling its principles of collaboration, engagement, and partnering with Tribes based on effective consultation.

The Tribes of the Missouri River Basin are diverse in their histories and perspectives regarding the Missouri River. Twenty-five Tribes (two located on the Wind River Reservation) are located within or have expressed significant interest in their historical connection to the Missouri River Basin (Figure 1.6-1).

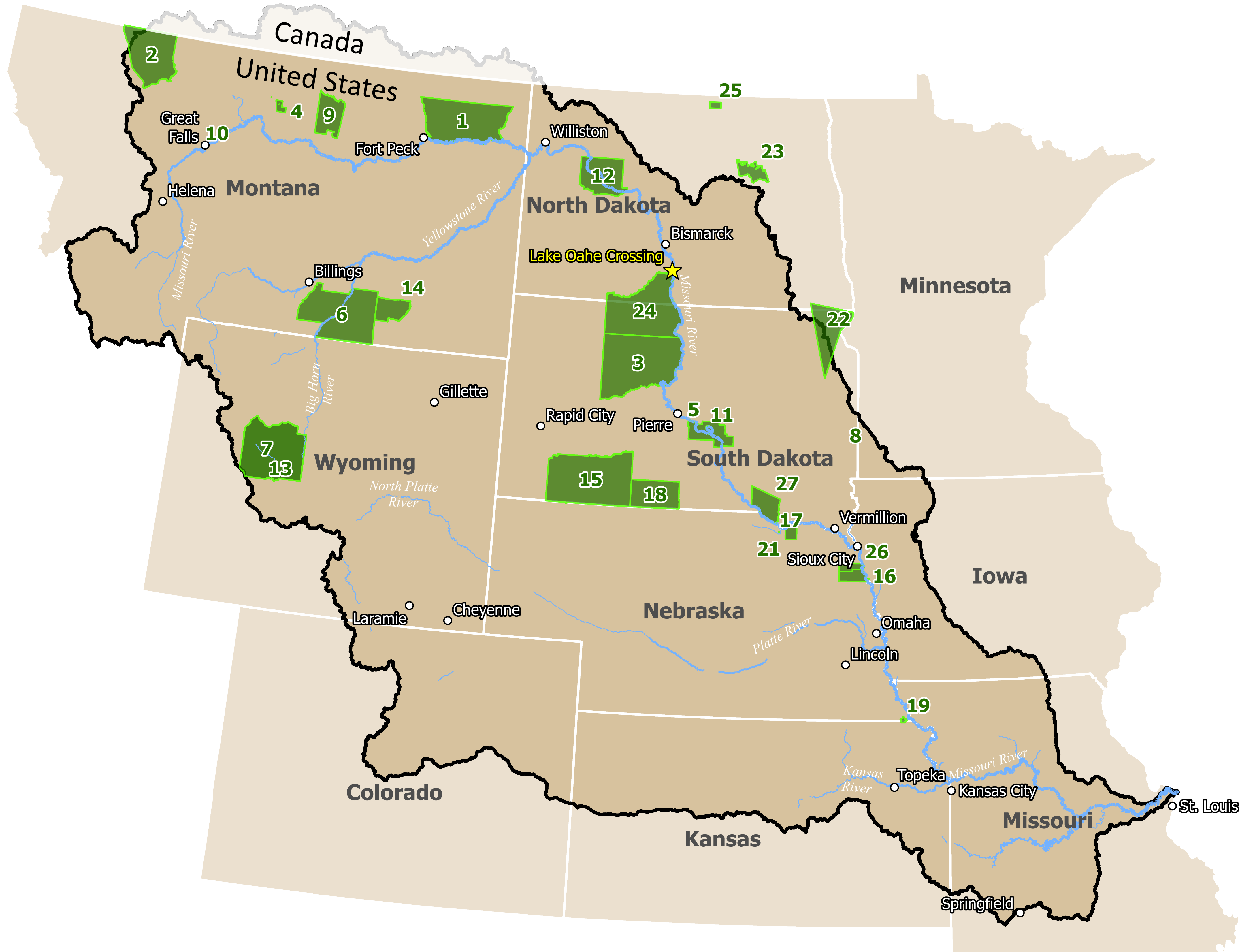
These Tribes maintain current and ancestral ties to the Missouri River and possess cultural, economic, and social interests in the river. Federal agencies have a trust responsibility to work with Tribes on a government-to-government basis in recognition of tribal sovereignty. The U.S. Government has a unique legal relationship with Tribal Nations, governed by treaties, statutes, EOs, court decisions, and the U.S. Constitution. The United States works with Indian Tribes on a government-to-government basis to address issues concerning Indian tribal self-government, trust resources, and Indian tribal treaty and other rights.

The USACE tribal consultation policy is composed of the following principles: tribal sovereignty, tribal responsibility, government-to-government relations, pre-decisional and honest consultation, self-reliance, capacity building and growth, and natural and cultural resources. The USACE Omaha District strives to establish relationships that focus on successful communications and a collaborative process that ensures tribal involvement in Project development and implementation. The USACE's tribal policy principles state that as part of its Trust Responsibility, it will "work to meet trust obligations, protect trust resources, and obtain tribal views of trust and treaty responsibilities" (USACE, n.d.). Trust resources typically include, but are not limited to, water, fish, wildlife, and vegetation under the USACE's regulatory review or USACE-managed lands. A summary of the USACE government-to-government consultation and coordination efforts completed to date is provided in Section 1.6.1.2.

Comments received note the need for the federal government to honor Tribes' rights to free, prior and informed consent (FPIC). FPIC is a right that is recognized by international standards like the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) and was developed in the context of protecting indigenous rights to self-determination in relation to impacts on culture, land use, and the environment from land development (e.g., industrial development) (Smith, 2017; United Nations, 2007; FAO, 2016). As part of addressing indigenous rights, guidance in the FPIC standards can help design and create a culturally appropriate consultation process with indigenous communities. UNDRIP provides minimum standards for human rights of indigenous peoples, including self-determination, and references FPIC in several of its articles (Articles 10, 19, 28, and 29).

The federal government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with Tribal Nations. The unique legal relationship between the federal government and Indian tribal governments is established in the Constitution of the United States, treaties, statutes, Eos, and court decisions. Neither FPIC nor UNDRIP is legally binding on the federal government; however, robust federal laws and processes are consistent with them. Federal law recognizes that self-identified indigenous or tribal groups have distinct social, cultural, and economic institutions and have connections to the natural environment. The right of self-determination is demonstrated through government-to-government relationships and the requirement to consult with Tribes regarding federal actions (e.g., permitting actions outside of Indian Country). The USACE will continue to consult with Tribes to fulfill their trust obligations.

1. Assiniboine and Sioux Tribes of Fort Peck
2. Blackfeet Tribe
3. Cheyenne River Sioux Tribe
4. Chippewa Cree Tribe of the Rocky Boy's Reservation
5. Crow Creek Sioux Tribe
6. Crow Nation
7. Eastern Shoshone Tribe
8. Flandreau Santee Sioux Tribe
9. Gros Ventre and Assiniboine Tribes of Fort Belknap
10. Little Shell Chippewa Tribe
11. Lower Brule Sioux Tribe
12. Mandan, Hidatsa and Arikara Nation
13. Northern Arapaho Tribe
14. Northern Cheyenne Tribe
15. Oglala Sioux Tribe
16. Omaha Tribe of Nebraska
17. Ponca Tribe of Nebraska
18. Rosebud Sioux Tribe
19. Sac and Fox Nation of Missouri in Kansas and Nebraska
20. Sac and Fox Nation of Oklahoma *
21. Santee Sioux Nation
22. Sisseton-Wahpeton Sioux Tribe
23. Spirit Lake Sioux Tribe
24. Standing Rock Sioux Tribe
25. Turtle Mountain Band of Chippewa
26. Winnebago Tribe of Nebraska
27. Yankton Sioux Tribe



*Located outside Omaha District Civil Works Boundary

0 50 100 Miles 1:7,000,000	Lake Oahe Crossing Tribal Reservation Land Missouri River Basin	**Figure 1.6-1: Government-to-Government Consultation of the Draft EIS** **Dakota Access Pipeline Lake Oahe Crossing Project** Morton County and Emmons County, North Dakota

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1.6.1.1. Consultation under Section 106 of the National Historic Preservation Act

Additionally, Tribes will be consulted in compliance with NHPA Section 106, which requires federal agencies to take into account the effects of their actions/undertakings on historic properties and to provide the ACHP with a reasonable opportunity to comment. In addition, federal agencies are required to consult on the Section 106 process with SHPOs, THPO, Indian Tribes (to include Alaska Natives), and Native Hawaiian Organizations. NHPA Section 106 compliance will follow the Programmatic Agreement, as amended. Tribes that are not signatories will follow standard NHPA Section 106 processes.

1.6.1.2. Consultation Efforts to Date

The Omaha District initiated consultation for this EIS in September 2020 by contacting the ACHP; Bureau of Indian Affairs; Montana SHPO; National Trust for Historic Preservation; History Nebraska; North Dakota Historical Society; South Dakota Department of Game, Fish, and Parks; South Dakota State Historical Society; and the following Tribes within the Omaha District via letter to determine their interest:

- Assiniboine and Sioux Tribes of Fort Peck
- Blackfeet Tribe
- Cheyenne River Sioux Tribe
- Chippewa Cree Tribe of the Rocky Boy’s Reservation
- Crow Creek Sioux Tribe
- Crow Nation
- Eastern Shoshone Tribe
- Flandreau Santee Sioux Tribe
- Fort Belknap Indian Community
- Little Shell Chippewa Tribe[15]
- Lower Brule Sioux Tribe
- Mandan, Hidatsa, and Arikara Nation
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Oglala Sioux Tribe
- Omaha Tribe of Nebraska
- Ponca Tribe of Nebraska
- Rosebud Sioux Tribe
- Sac and Fox Nation of Missouri in Kansas and Nebraska
- Sac and Fox Nation of Oklahoma
- Santee Sioux Nation
- Sisseton-Wahpeton Sioux Tribe
- Spirit Lake Sioux Tribe
- Standing Rock Sioux Tribe
- Turtle Mountain Band of Chippewa
- Winnebago Tribe of Nebraska
- Yankton Sioux Tribe

Consultation and informal coordination efforts with Tribes included official correspondence, conference calls, site visits, and official government-to-government consultation. Consultation and informal coordination efforts are ongoing throughout the development and implementation of this EIS.
Table 1.6-1 shows a list of contacts, correspondence, and official meetings with the five Tribes that responded at the beginning of the consultation process. Additional input was received from the Winnebago Tribe of Nebraska, Crow Creek Sioux Tribe, and Omaha Tribe of Nebraska after the Tribes

[15] Little Shell Chippewa Tribe were added to the Programmatic Distribution List in September 2021.

were provided with a preliminary draft of this EIS. Section 1.6.2.1 discusses the preliminary draft input in further detail.

Tribal commenters expressed that letters, emails, and telephone calls from the USACE to a Tribe is not consultation, and that consultation must include meaningful participation from both sides and engagement of decision-makers from the USACE. The USACE agrees that outreach and consultation are different. The table below includes consultation meetings in gray shading, but also includes the USACE's outreach and coordination to date to illustrate the efforts that have been made.

Table 1.6-1: Government-to-Government Consultation and Coordination Summary

Native American Tribe	Date	Summary
Cheyenne River Sioux Tribe		
Cheyenne River Sioux Tribe	4/9/2021	Letter from USACE to CRST to acknowledge interest in government-to-government and COVID-19 challenges to meeting, and offer to set up a government-to-government virtual meeting
Cheyenne River Sioux Tribe	5/14/2021	Letter from USACE to CRST to offer government-to-government meeting in June and July 2021
Cheyenne River Sioux Tribe	6/16/2021	Letter from CRST acknowledging acceptance of USACE's May 14 letter, but did not select a date for government-to-government meeting
Cheyenne River Sioux Tribe	7/16/2021	Letter from USACE to CRST responding to June 16, 2021, letter offering dates in September 2021 for government-to-government meeting
Cheyenne River Sioux Tribe	8/23/2021	Email confirmation from CRST confirming government-to-government meeting on September 24, 2021
Cheyenne River Sioux Tribe	9/8/2021	Letter from CRST to USACE postponing September 24, 2021 government-to-government meeting
Cheyenne River Sioux Tribe	9/20/2021	Letter from USACE to CRST to acknowledge government-to-government meeting postponement
Cheyenne River Sioux Tribe	9/22/2021	Letter from CRST to USACE identifying several issues and requesting more government-to-government consultation
Cheyenne River Sioux Tribe	9/28/2021	Phone call from USACE to CRST; a message was left requesting a discussion about meeting postponement
Cheyenne River Sioux Tribe	12/1/2021	Letter from USACE to CRST offering dates in December, January, and February offering for government-to-government consultation
Cheyenne River Sioux Tribe	1/14/2022	Email from USACE to CRST confirming December 1, 2021, letter and offering February dates for government-to-government consultation
Cheyenne River Sioux Tribe	3/2/2022	Government-to-government in-person meeting between USACE and CRST, SRST, Yankton Sioux Tribe, and Oglala Sioux Tribe
Cheyenne River Sioux Tribe	3/9/2022	Letter from USACE to CRST offering dates in March, April, and May for government-to-government consultation

Native American Tribe	Date	Summary
Cheyenne River Sioux Tribe	4/28/2022	Government-to-government in-person meeting between USACE and CRST
Cheyenne River Sioux Tribe	6/2/2022	Letter from USACE to CRST offering dates in June and August for government-to-government consultation
Cheyenne River Sioux Tribe	8/30/2023	Government-to-government in-person meeting between USACE and CRST
Mandan, Hidatsa, and Arikara Nation		
Mandan, Hidatsa, and Arikara Nation	3/17/2021	Letter to USACE requesting government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	4/27/2021	Government-to-government conference call between MHA Nation and USACE
Mandan, Hidatsa, and Arikara Nation	5/3/2021	Letter from MHA Nation to acknowledge USACE response to the March 17, 2021, letter and conference call and request for additional consultation
Mandan, Hidatsa, and Arikara Nation	5/25/2021	Letter from USACE to MHA Nation to offer government-to-government consultation dates in June and July
Mandan, Hidatsa, and Arikara Nation	9/15/2021	Letter from USACE to MHA Nation to offer dates for government-to-government consultation in September, October, and November
Mandan, Hidatsa, and Arikara Nation	9/16/2021	Phone call from USACE to MHA Nation; left message that a letter was being mailed with dates of availability for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	9/28/2021	Phone call from USACE to MHA Nation; a message was left requesting if they have selected a date for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	12/1/2021	Letter from USACE to MHA Nation offering December, January, February dates for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	1/14/2022	Email from USACE to MHA Nation confirming December 1, 2021, letter and offering February dates for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	1/20/2022	Phone call from MHA to USACE discussing government-to-government meeting date options
Mandan, Hidatsa, and Arikara Nation	3/7/2022	Letter from USACE to MHA Nation offering dates in March, April, and May for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	6/2/2022	Letter from USACE to MHA Nation offering dates in June and August for government-to-government consultation
Mandan, Hidatsa, and Arikara Nation	5/2/2023	Resubmittal of declaration by the Chairman dated 4/19/2021 stating that the Tribe’s comments have not changed
Oglala Sioux Tribe		
Oglala Sioux Tribe	4/26/2021	Oglala Sioux Tribe and USACE government-to-government meeting

Native American Tribe	Date	Summary
Oglala Sioux Tribe	4/28/2021	Letter from Oglala Sioux Tribe requesting expansion of their Cooperating Agency area of special expertise and acknowledging USACE interest in conducting government-to-government consultation
Oglala Sioux Tribe	4/29/2021	Letter from USACE to Oglala Sioux Tribe to acknowledge government-to-government request that was received during the tribal scoping meeting held October 13, 2020
Oglala Sioux Tribe	5/27/2021	Letter from USACE acknowledging the receipt of Oglala Sioux Tribe's letters and offering government-to-government consultation in June and July 2021
Oglala Sioux Tribe	7/16/2021	Letter from USACE to Oglala Sioux Tribe offering dates for consultation in September 2021
Oglala Sioux Tribe	7/22/2021	Email from Oglala Sioux Tribe to USACE accepting the September 10, 2021, for a government-to-government consultation meeting
Oglala Sioux Tribe	9/15/2021	Letter from USACE to Oglala Sioux Tribe confirming rescheduled government-to-government consultation meeting on October 8, 2021
Oglala Sioux Tribe	9/22/2021	Letter from Oglala Sioux Tribe to USACE withdrawing the Tribe from Cooperating Agency status
Oglala Sioux Tribe	9/22/2021	Letter from Oglala Sioux Tribe to USACE identifying several issues and requesting more government-to-government consultation
Oglala Sioux Tribe	9/28/2021	Call from USACE to Oglala Sioux Tribe coordinating agenda for October 8, 2021, consultation meeting
Oglala Sioux Tribe	10/7/2021	Letter from USACE acknowledging Oglala Sioux Tribe's withdrawal as a Cooperating Agency
Oglala Sioux Tribe	10/8/2021	Government-to-government in-person meeting between USACE and Oglala Sioux Tribe
Oglala Sioux Tribe	12/1/2021	Letter from USACE to Oglala Sioux Tribe offering December, January, February dates for government-to-government consultation
Oglala Sioux Tribe	1/14/2022	Email from USACE to Oglala Sioux Tribe confirming December 1, 2021, letter and offered February dates for government-to-government consultation
Oglala Sioux Tribe	3/2/2022	Government-to-government in-person meeting between USACE and CRST, SRST, Yankton Sioux Tribe, and Oglala Sioux Tribe
Oglala Sioux Tribe	3/7/2022	Letter from USACE to Oglala Sioux Tribe offering dates in March, April, and May for government-to-government consultation
Oglala Sioux Tribe	6/2/2022	Letter from USACE to Oglala Sioux Tribe offering dates in June and August for government-to-government consultation

Native American Tribe	Date	Summary
Standing Rock Sioux Tribe		
Standing Rock Sioux Tribe	10/12/2020	Letter from SRST to USACE requesting government-to-government consultation and an extension to the scoping period
Standing Rock Sioux Tribe	Unknown	USACE response to SRST's October 12, 2020, letter acknowledging request for government-to-government consultation
Standing Rock Sioux Tribe	1/21/2021	SRST and USACE government-to-government in-person consultation meeting
Standing Rock Sioux Tribe	4/9/2021	Letter from USACE to SRST acknowledging government-to-government request that was received during October 13, 2020, tribal scoping meeting
Standing Rock Sioux Tribe	5/14/2021	Letter from USACE to SRST offering dates for consultation in June and July 2021
Standing Rock Sioux Tribe	7/8/2021	Government-to-government in-person consultation meeting between USACE and SRST
Standing Rock Sioux Tribe	9/22/2021	Letter from SRST to USACE identifying several issues and requesting more government-to-government consultation
Standing Rock Sioux Tribe	11/23/2021	SRST and USACE government-to-government in-person consultation meeting
Standing Rock Sioux Tribe	12/1/2021	Letter from USACE to SRST offering December, January, and February dates for government-to-government consultation meeting
Standing Rock Sioux Tribe	1/10/2022	Letter from SRST to USACE requesting government-to-government consultation
Standing Rock Sioux Tribe	1/13/2022	Phone call from USACE to SRST confirming receipt of December 1, 2021, letter. SRST confirmed receipt of letter on phone call
Standing Rock Sioux Tribe	1/14/2022	Email from USACE to SRST following up and confirming dates through February for government-to-government consultation
Standing Rock Sioux Tribe	1/17/2022	Email from USACE to SRST following up and confirming dates through February for government-to-government consultation
Standing Rock Sioux Tribe	1/19/2022	Phone call from SRST to USACE; a message was left regarding scheduling a government-to-government meeting
Standing Rock Sioux Tribe	1/20/2022	Phone call from USACE to SRST discussing government-to-government meeting date options
Standing Rock Sioux Tribe	1/20/2022	Letter from SRST to USACE withdrawing the Tribe from Cooperating Agency status
Standing Rock Sioux Tribe	3/2/2022	Government-to-government consultation in-person meeting between USACE and CRST, SRST, Yankton Sioux Tribe, and Oglala Sioux Tribe
Standing Rock Sioux Tribe	3/7/2022	Letter from USACE to SRST offering dates in March, April, and May for government-to-government consultation

Native American Tribe	Date	Summary
Standing Rock Sioux Tribe	4/28/2022	Government-to-government consultation in-person meeting between USACE and SRST
Standing Rock Sioux Tribe	6/2/2022	Letter from USACE to SRST offering dates in June and August for government-to-government consultation
Standing Rock Sioux Tribe	7/13/2022	Emailed Mr. Crow Ghost to follow up with him on interest received from the Tribe to have a government-to-government consultation meeting the week of August 22–25, 2022
Standing Rock Sioux Tribe	7/28/2022	Emailed and called Mr. Crow Ghost to confirm the consultation meeting the week of August 22–25, 2022. A message was left with Mr. Crow Ghost
Standing Rock Sioux Tribe	8/1/2022	Received email from Mr. Crow Ghost he was working with Chairwoman Alkire to confirm consultation meeting
Standing Rock Sioux Tribe	8/12/2022	Emailed Mr. Crow Ghost that no confirmation on a date for consultation the week of August 22–25, 2022, has been received. The meeting will need to be rescheduled to accommodate adequate preparations and travel
Standing Rock Sioux Tribe	5/8/2023	Letter from SRST to USACE commenting on the government-to-government consultation and meaningful involvement in the NEPA process
Standing Rock Sioux Tribe	5/11/2023	Government-to-government consultation in-person meeting between USACE and SRST
Yankton Sioux Tribe		
Yankton Sioux Tribe	10/26/2020	Letter from Yankton Sioux Tribe to USACE requesting Cooperating Agency status and government-to-government consultation
Yankton Sioux Tribe	3/30/2021	Letter from Yankton Sioux Tribe to USACE withdrawing request to be Cooperating Agency
Yankton Sioux Tribe	5/6/2021	Letter from Yankton Sioux Tribe requesting meaningful consultation as per the Yankton Sioux Tribe protocols
Yankton Sioux Tribe	5/27/2021	Letter from USACE to Yankton Sioux Tribe acknowledging withdrawal as Cooperating Agency and offering government-to-government consultation meeting dates in June and July
Yankton Sioux Tribe	7/16/2021	Letter from USACE to Yankton Sioux Tribe offering more dates in September for government-to-government consultation meeting
Yankton Sioux Tribe	9/15/2021	Letter from USACE to Yankton Sioux Tribe offering additional dates for government-to-government consultation meeting in September, October, and November
Yankton Sioux Tribe	9/16/2021	Phone call from USACE to Yankton Sioux Tribe; message left requesting conversation to discuss tribal requests and government-to-government consultation

Native American Tribe	Date	Summary
Yankton Sioux Tribe	9/28/2021	Phone call from USACE to Yankton Sioux Tribe; message left requesting conversation to discuss tribal requests and government-to-government consultation
Yankton Sioux Tribe	12/1/2021	Letter sent from USACE to Yankton Sioux Tribe offering December, January, February dates for government-to-government consultation
Yankton Sioux Tribe	1/14/2022	Email sent from USACE to Yankton Sioux Tribe confirming December 1, 2021, letter and offer February dates for government-to-government consultation
Yankton Sioux Tribe	3/2/2022	Government-to-government in-person meeting between USACE and CRST, SRST, Yankton Sioux Tribe, and Oglala Sioux Tribe
Yankton Sioux Tribe	3/7/2022	Letter from USACE to Yankton Sioux Tribe offering dates in March, April, and May for government-to-government consultation
Yankton Sioux Tribe	6/2/2022	Letter from USACE to Yankton Sioux Tribe offering dates in June and August for government-to-government consultation

CRST = Cheyenne River Sioux Tribe; MHA = Mandan, Hidatsa, and Arikara [Nation]; SRST = Standing Rock Sioux Tribe; USACE = U.S. Army Corps of Engineers
Notes: Gray shaded rows represent government-to-government meetings/consultation. Nonshaded rows represent coordination efforts between USACE and Tribes.

Consultation is an ongoing process and will continue throughout the preparation of this EIS. The USACE will continue to reach out to interested Tribes to offer consultation. Tribes will continue to be consulted throughout the EIS process, specifically prior to and during all major milestones in the NEPA process.

1.6.2. Tribal Concerns Identified During Scoping

During scoping, a tribal meeting was held on October 13, 2020. Tribes expressed concerns about the impacts on tribal economics with regard to hunting, fishing, and their cultures, and generally preserving their tribal way of life. Appendix C contains the Scoping Report, which summarizes all scoping comments received, including scoping comments received from Tribes. Tribal comments were provided on specific topics, including:

- The impact of operations and maintenance of the current easement without additional conditions on cultural, historic, and tribal resources (see Section 3.7.3.3, [Cultural Resources] Alternative 3).
- The protection of cultural resources important to Tribes and human remains (see Section 3.7.1.1, Project Background: Affected Environment and Impacts; Section 3.7.3.1, Alternative 1; Section 3.7.3.2, Alternative 2; and Section 3.7.3.5, Alternative 5).
- The incorporation of tribal perspectives in the EIS regarding the impacts on and protection of cultural resources important to Tribes identified during consultation between the USACE and Tribes under Section 106 and EO 13175 (65 Fed. Reg. 67249) (see Section 1.6.1, [Introduction and Background] Government-to-Government Consultation and Coordination).
- General concerns about Project effects on environmental justice, which included the impact of a crude oil release on subsistence resources, water and other sacred resources, human health, and tribal treaty

rights; ensuring that tribal knowledge and scientific studies are integrated into the EIS; how Project-related climate change would disproportionately impact low income and minority communities; and that this Project along with other pipeline projects contribute to human trafficking (see Section 3.8, Socioeconomics, Environmental Justice, and Health).

1.6.2.1. Preliminary Draft Environmental Impact Statement Review

Following consultation meetings with Tribes in the spring of 2022, the USACE made the decision to incorporate an additional review period prior to the publication of the Draft EIS in order to facilitate additional comments and allow Tribes to review a Preliminary Draft EIS prior to public review. The Preliminary Draft EIS was mailed to the 27 Tribes identified in Section 1.6.1.2 on January 31, 2023. The Tribes were initially provided 30 days to review the Preliminary Draft EIS, but the review was extended to 60 days after receiving requests for more time. During this review period, the USACE sent the following letters to Tribes:

- January 31, 2023—Letter from the USACE to Tribes containing the Preliminary Draft EIS, comment form, schedule, and dates for Tribal Technical Meetings.
- February 22, 2023—Letter from the USACE to Tribes extending the Preliminary Draft EIS review process 30 days and providing updated dates for Tribal Technical Meetings.
- March 16, 2023—Letter from the USACE to Tribes reminding of the Preliminary Draft EIS extension and updated dates.
- April 18, 2023—Letter from the USACE to Tribes providing agenda and reminder for upcoming Tribal Technical Meetings.

Tribal Technical Meetings were held on April 26 and 27, 2023. The USACE received written comments on the Preliminary Draft EIS from the SRST; CRST; Oglala Sioux Tribe; Winnebago Tribe of Nebraska; and Mandan, Hidatsa, and Arikara (MHA) Nation. The USACE received verbal comments at the Tribal Technical Meetings from the Oglala Sioux Tribe, Omaha Tribe of Nebraska, MHA Nation, and Crow Creek Sioux Tribe.

All communications regarding the Preliminary Draft EIS included an invitation for any Tribe interested in consultation to contact the USACE.

2. ALTERNATIVES

The USACE is tasked with determining whether a new easement can be issued under the MLA for the Project to cross USACE-managed federal lands at Lake Oahe. Under the MLA, the USACE must consider what is required to control or prevent damage to the environment, damage to public or private property, hazards to public health and safety, and impose measures to protect the interests of individuals living in the general area who rely on natural resources for subsistence (30 USC § 185(h)(2)), as well as requirements that protect from sudden ruptures and slow degradation of the pipeline (30 USC § 185(g)). The purpose and need for this EIS is to evaluate whether a new easement can be issued under the MLA for the Project to cross USACE-managed federal lands at Lake Oahe. This evaluation considers the Project purpose of the Applicant Proposed Action to be the purpose of the DAPL Project (to transport up to 1,100,000 bpd from the Bakken and Three Forks production region in North Dakota to a crude oil market hub located near Patoka, Illinois, and ultimately to refineries located in the Midwest and the Gulf Coast), but the analysis is limited to effects of allowing the pipeline to cross federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota (i.e., the Project). Because the USACE's authority is limited to granting an easement under the MLA in a single location, this EIS evaluates alternatives to granting and denying an easement across the USACE's federal property. The alternatives are compared using the Project purpose of the Applicant Proposed Action.

2.1. Development of Alternatives

This section describes the broad range of potential alternatives considered and those carried forward for detailed analysis. While this EIS discusses the Project purpose, the analysis is limited to effects of allowing the pipeline to cross federally owned lands at Lake Oahe in Morton and Emmons counties, North Dakota. The federal action under consideration is to determine whether the USACE may grant an easement for Dakota Access to place the pipeline on federal real property interests acquired and managed by the USACE for the Oahe Dam / Lake Oahe Projects (i.e., the Applicant Proposed Action).

Evaluation of the impacts of these alternatives is presented in Chapter 3, Affected Environment, Impacts, and Mitigation. The USACE has, in accordance with CEQ regulations on implementing NEPA (40 CFR Part 1500) and USACE's NEPA-implementing regulations (33 CFR Part 230, 1977), developed five alternatives for evaluation in this EIS. In line with CEQ regulations (40 CFR § 1501.7), the USACE has considered comments received during the scoping period for this EIS, which occurred from September 10, 2020, to November 26, 2020, in determining the substantive issues related to the Applicant Proposed Action to be considered during development of the alternatives presented herein. See Section 1.5, Summary of Public Outreach and Coordination, for a summary of the scoping process.

Four broad alternatives were presented during scoping for input by the public. As a result of the scoping process, the four alternatives have been further refined, and an additional alternative, Alternative 5, has been added as a result of scoping comments. These five alternatives are clarified in the sections below. In particular, many comments supported Alternative 1 defined by commenters as removing the pipeline and restoring the land to original conditions. The methods for removal and restoration are described in detail in Section 2.5.1, Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required. Subsequently, Alternative 2 is clarified to include abandoning the pipeline in place without removal as described in detail in Section 2.5.2, Alternative 2: Easement is Not Granted and No Further Action.

The five alternatives for evaluation are as follows.

1. Alternative 1: The USACE would not grant an easement and would require restoration of USACE-administered federal lands to pre-pipeline conditions, including removal of the pipeline.
2. Alternative 2: The USACE would not grant an easement and would take no further action, including abandoning the pipeline in place.
3. Alternative 3: The USACE would grant the requested easement with the same conditions as the vacated easement.
4. Alternative 4: The USACE would grant the requested easement with additional conditions beyond those in the vacated easement.
5. Alternative 5: The USACE would deny the easement, and Dakota Access would reroute a portion of the DAPL Project pipeline. It is unknown exactly what route Dakota Access would seek to permit as a reroute, and any such reroute would require Dakota Access to go through permitting processes with any applicable permitting agency. However, to assess impacts of this alternative, the USACE is using the “North Bismarck Alternative” from the 2016 EA as a proxy to provide an analysis of potential impacts of a reroute and the associated abandonment of the existing pipeline (referred to in this EIS as the North Bismarck Reroute). This alternative would also require abandonment of the existing pipeline.

Additionally, this chapter incorporates by reference the detailed analysis of alternatives and any alternatives eliminated from detailed analysis that were documented in the 2016 EA, including alternative oil transportation methods exclusively using trucking and rail. However, these alternatives are further screened below to assess whether they meet CEQ regulations (40 CFR § 1502.14) and must be carried forward for detailed analyses of reasonable alternatives.

Reasonable alternatives carried forward are considered as to whether they meet the Project purpose of the Applicant Proposed Action (to carry 1,100,000 bpd of crude oil from North Dakota to Illinois and on to refineries in the Midwest and Gulf Coast), are technically and economically feasible, and avoid or minimize adverse impacts or enhance the quality of the human environment. Technical feasibility relates to available technology and construction capabilities, while economic feasibility considers the price-competitive nature of the Applicant Proposed Action. The cost of the alternative is not considered a critical factor unless the added cost would render the alternative economically impractical. Environmental advantage is evaluated generally here to identify whether the impacts of an alternative provide a benefit to the human or natural environment. Although Alternative 5 may not meet the Project purpose of the Applicant Proposed Action in the short-term, it has been carried forward for detailed analysis as a result of the scoping process. It also serves as a basis for comparison or a benchmark, enabling decision makers to compare the magnitude of environmental effects against the No Action Alternatives.

The impacts of the alternatives being carried forward are evaluated in Chapter 3, Affected Environment, Impacts, and Mitigation, based on available information and according to the methods described. The findings in Chapter 3 provide the basis for assessment of the relative merits of these alternatives.

During the scoping period, the USACE requested input on potential alternatives. Additional alternatives identified during scoping included:

- Alternative renewable energy sources such as solar, wind, and ethanol (see Section 2.3, Alternative Energy Sources)
- Alternative oil transportation (e.g., trucking and rail) resources (see Section 2.4, Alternative Transportation Methods)
- Pipeline routes that would not affect the Tribe (see Section 2.6.3, Alternative 5: North Bismarck Reroute)

The SRST requested that the EIS evaluate whether the pipeline route needs to cross the Missouri River at all. As discussed in Chapter 1, Introduction and Background, the NDPSC was the primary permitting authority for the DAPL Project within North Dakota. The NDPSC performed an extensive review of the DAPL Project within the state and authorized the route in its current location. The USACE jurisdiction for the Project is limited to responding to the Dakota Access request for an easement to cross Lake Oahe. At this time, the DAPL Project outside of USACE jurisdiction exists on either side of the Missouri River. Also, the Missouri River begins north of the starting point in Three Forks, Montana, and flows to the southeast to Kansas where it joins the Mississippi River. A route from the Bakken and Three Forks production region in North Dakota to Patoka, Illinois, requires a crossing of either the Missouri or Mississippi rivers. Therefore, an analysis of a pipeline route that does not cross the Missouri River is not considered further.

Additional alternatives not identified during scoping were discussed in the 2016 EA and eliminated from further consideration, including the potential modification of an existing pipeline and alternative water body crossing methods. The previous evaluations that eliminated these alternatives from further consideration remain valid and they are not discussed within this EIS.

2.2. DECISION-MAKING PROCESS

Scoping comments received included questions about when the USACE would make its decision on the Project, what would go into the decision, and when the selected alternative would be implemented. The decision-making process will be done in accordance with NEPA requirements, including CEQ regulations (40 CFR Parts 1500–1508), USACE ER 200-2-2 (33 CFR Part 230), and related environmental compliance requirements. Prior to publication of the Draft EIS, cooperating agencies were provided preliminary copies for their review and input, and Tribes within the Programmatic Agreement (USACE, 2004) were provided an early review and comment opportunity as well. For additional details, see Section 1.6, Federal, Tribal, State, and Local Agency Consultation and Coordination. Following the publication of the Draft EIS, the USACE will hold a public comment period, during which cooperating agencies and interested parties may provide feedback on any alternatives or information from the Draft EIS. The USACE will then prepare a Final EIS that addresses comments received on the Draft EIS. The USACE will make a decision on the Project after considering the analysis in the Final EIS, along with public comments, and summarize its decision in a Record of Decision. The Record of Decision will identify all alternatives considered, specify the environmentally preferable alternative or alternatives, and state the selected alternative. An environmentally preferable alternative is one that would best meet the goals set forth in Section 101 of NEPA (42 USC § 4331). CEQ's 40 Most Asked Questions Concerning the CEQ's National Environmental Policy Act states "ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." The USACE NEPA-implementing regulations (33 CFR Part 230) do not specifically define the environmentally preferable alternative or provide further guidance. The selected alternative may or may not be the environmentally preferable alternative due to relevant technical and economic considerations and agency statutory missions, which are all factors the USACE can take into account in its decision making (40 CFR § 1505.2). The Record of Decision will identify all factors considered in arriving at its selected alternative. The timing for the implementation of the selected alternative will depend in part on any timing requirements laid out in the Record of Decision.

2.3. ALTERNATIVE ENERGY SOURCES

The development of alternative renewable energy sources such as solar, wind, and ethanol were proposed by commenters. An alternative that cannot achieve the Project purpose of the Applicant Proposed Action cannot be considered as a reasonable alternative. If one of these alternatives were selected, crude oil would not be transported to the Midwest and Gulf Coast. If an alternative energy source were selected, other applicants would likely develop a new project or projects to transport oil from the Bakken and Three Forks production region in North Dakota to the crude oil market hub in Illinois and beyond to meet the current and projected market demands for oil in this region. It is reasonable to expect that under such scenarios, transports of oil from one or more other future pipeline facilities designed to transport oil would be proposed and eventually constructed. Any expansion of existing systems or construction of new facilities would result in specific environmental impacts that could be less than, similar to, or greater than those associated with the Project. The impacts for any replacement project capable of exporting similar volumes are likely to be comparable to the Applicant Proposed Action. Therefore, in addition to not meeting the Project purpose, these alternatives would also not likely reduce adverse impacts or enhance the quality of the human environment, and alternative energy sources are eliminated from further consideration.

2.4. ALTERNATIVE TRANSPORTATION METHODS

2.4.1. Trucking

As discussed in the 2016 EA, trucking as an alternative for transporting volumes of crude oil was considered as an alternative to the Project and eliminated. This alternative would require transportation of crude oil via truck from the production region to Illinois and ultimately to refineries throughout the Midwest and Gulf Coast. Truck transportation could occur on and in close proximity to the SRST reservation and the CRST reservation, per a declaration made by M.C. Aubele on April 28, 2020.[16] To transport the Project's 1,100,000 bpd (inclusive of the Optimization Project volumes), a fleet size of approximately 15,000 tanker trucks would be required, with 5,000 trucks filling, 5,000 returning, and

[16] *Standing Rock Sioux Tribe, Yankton Sioux Tribe, Robert Flying Hawk, Oglala Sioux Tribe and Cheyenne River Sioux Tribe, Sara Jumping Eagle, et al. v. U.S. Army Corps of Engineers and Dakota Access, LLC* (D.C. Cir. 2020; Case No. 1:16-cv-1534-JEB [and Consolidated Case Nos. 16-cv-1796 and 17-cv-267])

5,000 carrying the product. Some trucks would be traveling from the Bakken Region to the Gulf Coast, a distance of more than 1,500 miles.

The trucking alternative would require loading and offloading facility construction and increased labor costs through the employment of drivers and maintenance crews, potentially hindered by driver shortages. The American Trucking Association has noted a long-term shortage of long-haul transport drivers since 2005, estimating a shortage of 60,800 truck drivers in 2018 (ATA, 2019). Increased traffic associated with fuel oil trucks would also impact public road infrastructure and safety. The 2016 EA noted that the number of fatalities as a result of increased commercial traffic more than doubled between 2005 and 2012 in conjunction with the oil industry boom in North Dakota (DOT, 2014, as cited in the 2016 EA). Between 2012 and 2019, the number of fatalities has dropped by 41 percent (NDDOT, 2019); however, increased truck traffic on public roads under a trucking alternative transportation method would likely decrease road safety. When comparing transportation methods of hazardous liquids, truck transportation accounts for more than five times the fatalities per year as pipeline and rail transportation (Furchtgott-Roth and Green, 2013). Coupled with harsh winter weather affecting travel conditions, the potential impact on safety is much greater with this alternative.

With an increase in truck traffic, there would also be an increase in exhaust from combustion engines and therefore greater air emissions, including greenhouse gases, than the Project (which would result in negligible air emissions during operation; see Section 3.11, Air Quality and Noise). Additional impacts would be incurred from the construction of the required loading and offloading facilities. As a result of the potential adverse impacts on the human environment, this alternative is not carried forward as a stand-alone alternative. However, should Alternatives 1 or 2 discussed below be selected, it is likely that Dakota Access would seek to construct and operate an alternative pipeline route (Alternative 5). During the permitting and construction of a reroute, Dakota Access's customers would likely transport the oil by truck and/or rail. As such, trucking is discussed in Chapter 3 as an indirect effect of Alternative 5.

2.4.2. Rail

Alternative oil transportation by rail was evaluated in the 2016 EA and eliminated from further evaluation. Under this alternative, crude oil would be transported via trains and fueled by combustion engines, rather than pipeline. Rail transportation could occur on and near the SRST and the CRST reservations and could cross the Missouri River less than 2 miles upstream of the SRST's new drinking water intake per a declaration made by M.C. Aubele.[17] The 2016 EA calculated the number of rail cars that would be needed to meet the previous capacity of 570,000 bpd of crude oil. However, with the Optimization Project, the pipeline could transport up to 1,100,000 bpd. The SRST, the State of North Dakota, and Dakota Access have provided multiple declarations from experts (William J. Rennicke and

[17] *Standing Rock Sioux Tribe, Yankton Sioux Tribe, Robert Flying Hawk, Oglala Sioux Tribe and Cheyenne River Sioux Tribe, Sara Jumping Eagle, et al. v. U.S. Army Corps of Engineers and Dakota Access, LLC* (D.C. Cir. 2020; Case No. 1:16-cv-1534-JEB [and Consolidated Case Nos. 16-cv-1796 and 17-cv-267])

Dr. Fagan), regarding the availability of rail cars to transport crude oil.[18,19,20] Crude oil is required to be transported in specialized tank cars meeting the Pipeline Hazardous Material Safety Administration (PHMSA) Class 3 flammable liquid transportation requirements described in 81 Fed. Reg. 53935. Mr. Rennicke's 2021 declarations calculate that transport of 570,000 bpd by rail, depending on the destination, would require a fleet of between 8,500 and 12,800 specialized tank cars. Using Mr. Rennicke's methodology, this fleet range has been scaled up to meet the Optimization Project volume. To transport 1,100,000 bpd by rail, a total fleet range of 16,500 to 24,750 specialized rail cars would be needed. This range is based on a full round trip railcar cycle of between 10 and 15 days. The SRST, the State of North Dakota, and Dakota Access experts (William J. Rennicke and Dr. Fagan) have all indicated there are not enough rail cars currently available to transport the proposed full Project volumes.

Regardless, even if the fleet size required to transport the volume were available or became available in the near future, existing rail terminals in North Dakota (Bakken Oil Express and Great Northern Midstream) have an estimated maximum capacity of approximately 3.5 loaded crude oil trains of 100 cars that could be transported daily, which would only amount to 260,000 bpd. Rail operation as an alternative transportation method would therefore either require additional construction of higher capacity terminals and rail lines or supplemental transportation via truck or pipeline to meet the Project purpose of the Applicant Proposed Action.

Reports of accidents resulting in property damage, injury, or death are substantially higher from railroad transport than pipeline (DOT BTS, 2021). In a 2018 report to Congress, PHMSA noted that based on percent released of amount shipped and incident rate, transportation of oil by pipeline would be considered safer than rail, while based on human consequences, rail would be safer than pipeline (PHMSA, 2018). For oil transported by pipeline, an incident occurred approximately once every 720 million gallons of crude oil shipped; for rail, an incident occurred approximately once every 50 million gallons of crude oil shipped, a 14-fold difference (PHMSA, 2018). PHMSA recommended additional study to be able to conclude which mode is the safest for transportation of oil. The environmental impacts that would be incurred by the required construction of a sufficiently sized rail facility, in addition to the higher risk of release incidents, result in potential adverse impacts on the human environment. Therefore, this alternative is not carried forward as a stand-alone alternative. However, as discussed for trucking above, rail could be used during construction of the North Bismarck Reroute should Alternatives 1 or 2 be selected. As such, rail transportation is discussed in Chapter 3 as an indirect effect of Alternative 5.

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[3] Declaration of Marie Fagan in *Standing Rock Sioux Tribe and Cheyenne River Sioux Tribe v. U.S. Army Corps of Engineers and Dakota Access, LLC* (D.C. Cir. 2020; Case No. 1:16-cv-1534-JEB [and Consolidated Case Nos. 16-cv-1796 and 17-cv-267])

[4] Declaration of William J. Rennicke and Second Declaration of William J. Rennicke in *Standing Rock Sioux Tribe, Yankton Sioux Tribe, Robert Flying Hawk, Oglala Sioux Tribe and Cheyenne River Sioux Tribe, Sara Jumping Eagle, et al. v. U.S. Army Corps of Engineers and Dakota Access, LLC* (D.C. Cir. 2020; Case No. 1:16-cv-1534-JEB [and Consolidated Case Nos. 16-cv-1796 and 17-cv-267])

[20] Third Declaration of William J. Rennicke and Supplemental Declaration of William J. Rennicke in *Standing Rock Sioux Tribe, Yankton Sioux Tribe, Robert Flying Hawk, Oglala Sioux Tribe and Cheyenne River Sioux Tribe, Sara Jumping Eagle, et al. v. U.S. Army Corps of Engineers and Dakota Access, LLC* (D.C. Cir. 2021; Case No. 1:16-cv-1534-JEB [and Consolidated Case Nos. 16-cv-1796 and 17-cv-267])

2.5. No Action Alternatives

The CEQ regulations for implementing NEPA require the evaluation of the No Action Alternative (40 CFR § 1502.14(c)). In general, any No Action Alternative is unlikely to meet a project's purpose and need, but should be evaluated to inform decision making and allow an agency to understand the effects of an action in consideration of meeting a purpose and need.

Under the No Action Alternative, the USACE would not grant an easement to cross federal property at Lake Oahe, which results in the requirement to abandon the existing pipeline either by removal or in place. Each type of abandonment is considered as a separate No Action Alternative. Although the No Action Alternatives presented in this EIS cannot meet the Project purpose and need, many commenters requested consideration and selection of a No Action Alternative. Further the No Action Alternatives will require ground disturbance and result in environmental effects. Therefore, the USACE finds it prudent to fully evaluate the effects of these alternatives throughout this EIS to disclose the impacts and support informed decision making.

In the USACE's NOI, Alternative 1 had been identified as the single No Action Alternative. However, as the USACE reviewed the extent of the work involved to remove the pipeline, the USACE identified a need to examine two no action alternatives, which accurately reflect the two abandonment procedures available if the easement is denied, either abandonment by removal of the pipeline (Alternative 1) or abandonment in place (Alternative 2). This EIS evaluates both alternatives and considers the difference in effects of the alternative paths to abandon the pipeline should an easement not be granted.

2.5.1. Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required

Alternative 1 was identified as the No Action Alternative in the USACE's NOI published on September 10, 2020. Under this alternative, the USACE would not grant an easement to cross the federal property at Lake Oahe and would require restoration of the USACE-administered federal lands to pre-pipeline conditions. Numerous comments received during the scoping period were in support of this alternative and specifically request that the pipeline be removed. Therefore, if Alternative 1 is selected, approximately 7,500 feet of the 30-inch diameter pipeline within the Project Area would be removed, approximately 6,400 feet of which is beneath Lake Oahe. The pipeline is entirely submerged beneath the ground, extending approximately 911 feet east from the east bank and 1,138 feet west of the west bank. The pipeline is buried approximately 95 to 126 feet below the bottom of Lake Oahe, which has a water depth ranging from approximately 3 feet at its shallowest point in the crossing area to approximately 30 feet at its deepest.

The pipeline would be shut down prior to commencement of removal activities. Removing the pipeline would involve consideration for the depth of the pipeline below the lake, the difference in elevation of that segment and the HDD entry and exit points, and the bentonite clay surrounding the pipe. Bentonite is fluid during pipeline installation but hardens after installation is complete. Because the pipe has been in the ground for nearly 6 years, it is presumed to be cemented in place by the bentonite. Removing the pipeline via the original HDD entry and exit points (i.e., to "pull" the pipeline out) could break the pipeline due to the bentonite casing around the pipe and resulting friction, and therefore is not considered possible.

The Project pipeline is located parallel to and approximately 100 feet from the Northern Border Pipeline Company (Northern Border) pipelines, an interstate natural gas transmission pipeline system that transitions into two pipelines at the Lake Oahe crossing. Excavation of the Project pipeline poses a risk to the Northern Border pipelines and would likely require their relocation prior to the removal work associated with Alternative 1. Impacts associated with the relocation of the Northern Border pipelines cannot be analyzed at this time as Northern Border has not identified an alternative route to consider or relocation method and is not required to do so as part of this review. However, relocation of the Northern Border pipelines would require construction across Lake Oahe. The extent of environmental impacts associated with a Northern Border pipeline reroute would depend on the selected route and relocation method, and would require NEPA analysis and authorization through the Federal Energy Regulatory Commission (FERC) in addition to other federal, state, and local permits required for a new route location. Review and permitting of a reroute could take 2 or more years as no planning or preliminary routing has occurred to support any permitting and relocation efforts.

A conceptual plan was developed for the removal of the pipeline for a qualitative assessment of what pipeline removal could entail, as shown on Figures 2.5-1 and 2.5-2. The removal of the pipeline from beneath the lake bed would require dewatering a portion of the lake to allow for access to the pipe. The conceptual dewatering plan involves two phases and requires clearing, topsoiling, and grading workspace on both sides of the lake for staging of equipment, material, and spoil storage. Phase one would consist of installation of an approximately 3,400-foot-long cofferdam on the east side of the lake enveloping both the Project pipeline and the Northern Border pipelines to divert river flow to the west and dewatering approximately 72,000,000 gallons of water from within the cofferdam via pumping, followed by excavating and removing approximately 3,500 feet of the Project pipeline on the east side of the lake. This area would then be backfilled and restored. Phase two would consist of construction of an approximately 2,300-foot-long cofferdam on the west side, enveloping both the Project pipeline and the Northern Border pipelines, to divert flow to the east. Approximately 176,000,000 gallons of water would be dewatered via pumping, and the remaining segment of pipeline would be excavated and removed under the west side of the lake.

Conceptual excavation for both phases would require removal of 12,300,000 cubic yards of soil within an approximately 77-acre footprint, with an additional 1,400 acres onshore for temporary spoil storage. In an effort to minimize disturbance, typical dump trucks (holding approximately 12 cubic yards) and excavation materials were assumed. Spoil would be transported via new, two-lane, 75-foot-wide haul roads from the excavation areas to the spoil storage areas. Due to the extent of the excavation required, this process could take from 6 to 20 years or more for completion. Mining-scale dump trucks and excavators could reduce the amount of time to complete the work, but would increase the area of disturbance, requiring wider excavation, haul roads, and spoil storage, as well as potentially requiring realignment of electrical transmission towers collocated with the Project to the north of the pipeline. In addition to logistical challenges, excavation of the pipeline under Lake Oahe presents safety hazards. The west side of the crossing passes through steep slopes adjacent to an active river, increasing the potential for incident and casualty during construction.

Restoration of the lake bed, Lake Oahe, and the federal lands to pre-pipeline conditions would require backfill to be placed in excavated areas to reach pre-construction elevations. Construction methods would follow mitigation and BMPs that were established for the pipeline installation, including use of a SWPPP and SPCC Plan. Disturbed areas would be stabilized using erosion control measures and revegetation would occur according to the SWPPP and state and federal permit requirements (e.g., USACE Clean Water Act and Rivers and Harbors Act permits), and an ECP.

This alternative would not meet the stated Project purpose of the Applicant Proposed Action on its own, and Dakota Access would likely seek to construct and operate a pipeline reroute; therefore, Alternative 1 is considered throughout this document in connection with Alternative 5 (the North Bismarck Reroute).

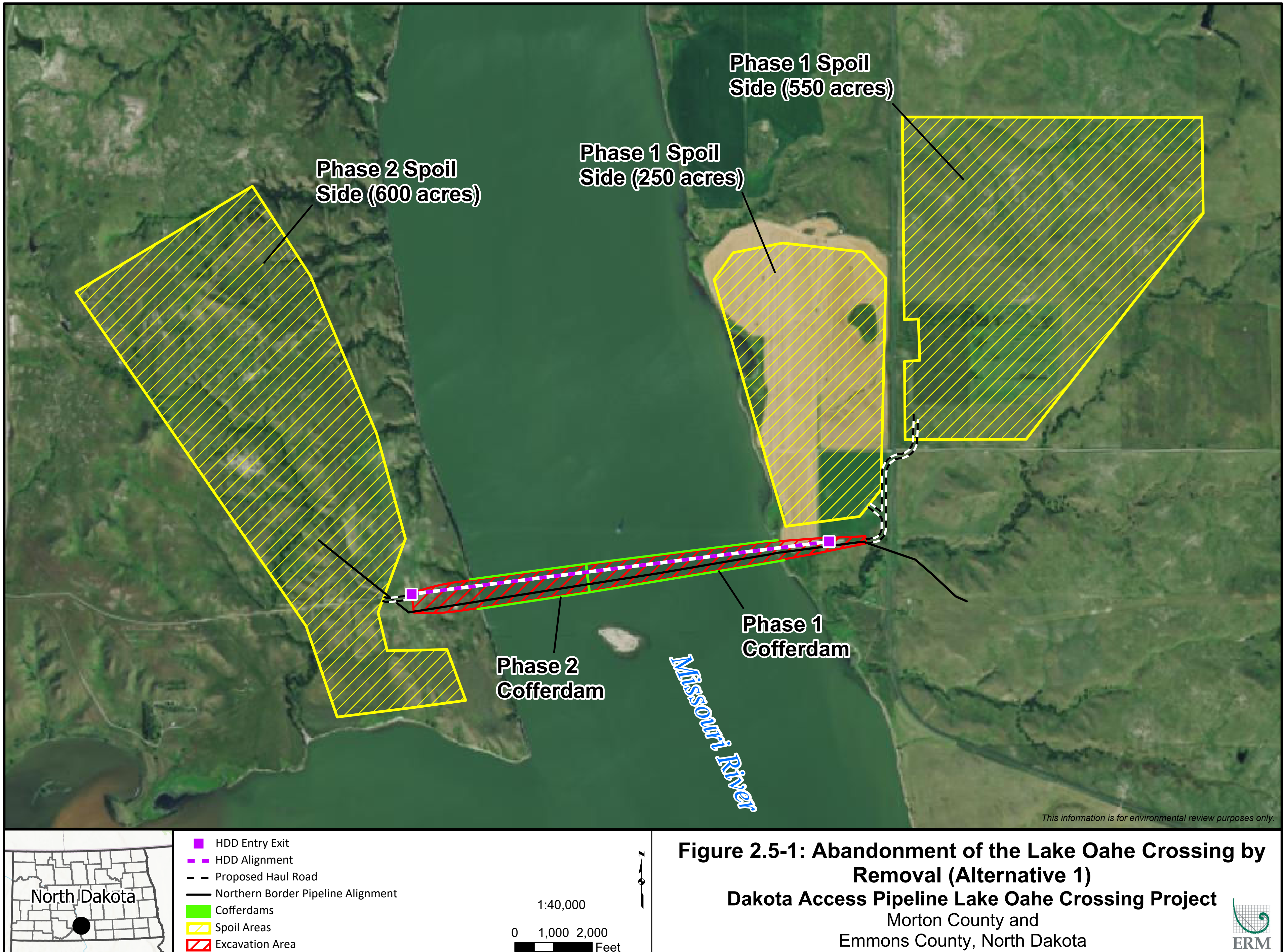

Figure 2.5-1: Abandonment of the Lake Oahe Crossing by Removal (Alternative 1)

Dakota Access Pipeline Lake Oahe Crossing Project

Morton County and
Emmons County, North Dakota

REVISED: 09/22/2021 | SCALE: 1:40,000

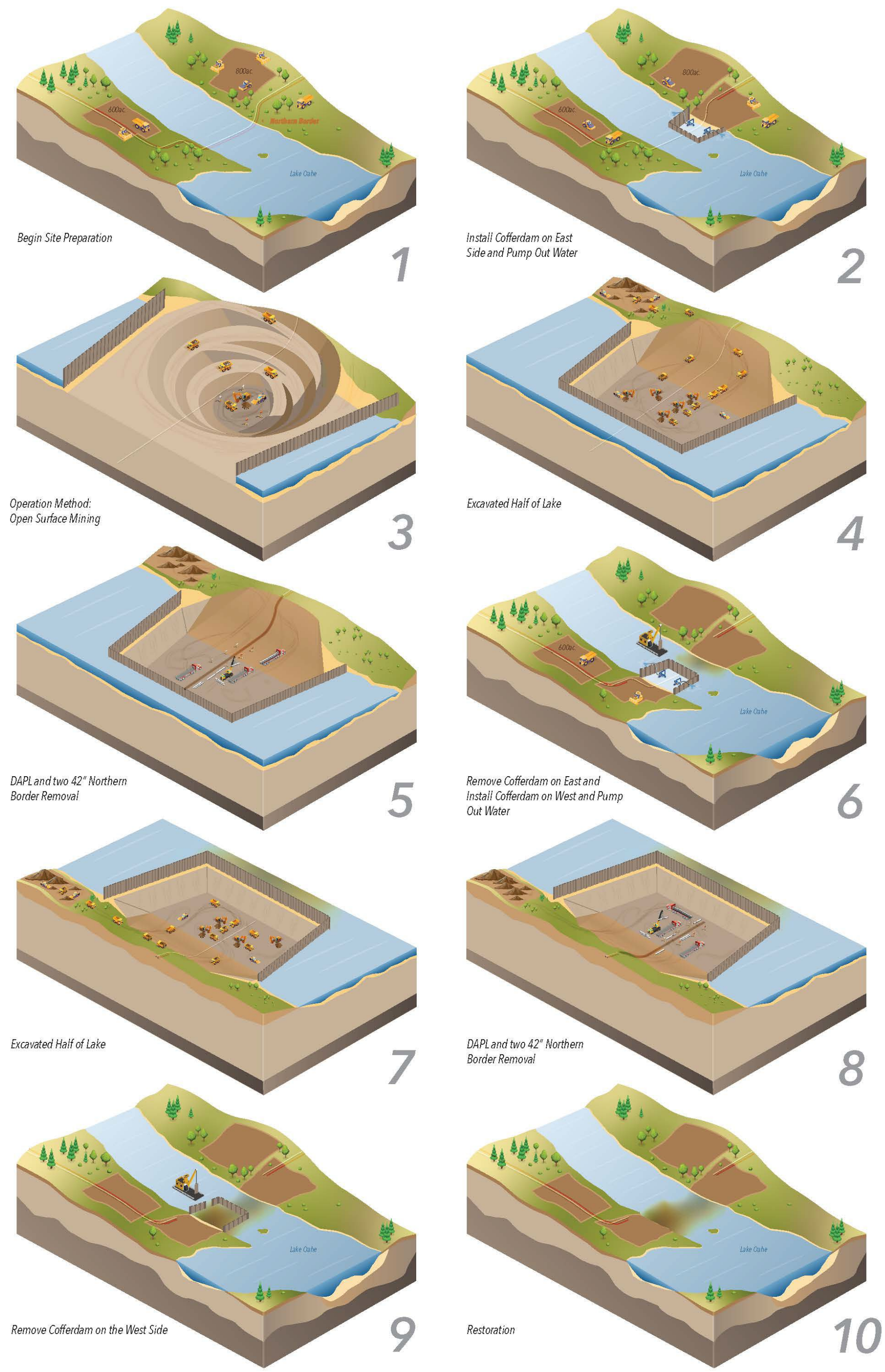

Figure 2.5-2: Alternative 1 Removal Sequence

2.5.2. Alternative 2: Easement is Not Granted and No Further Action

Under Alternative 2, the USACE would not grant an easement to cross the federal property at Lake Oahe and the 7,500 feet of pipeline within the Project Area would be abandoned in place and not in use. The NOI published by the USACE on September 10, 2020, did not initially identify that Alternative 2 would require abandonment. However, in the event that the USACE does not grant an easement and would "take no further action," the existing pipeline would be required to be either abandoned by removal or abandoned in place. As Alternative 1 examines the impact of removing the pipeline, Alternative 2 examines the impact of abandonment in place. Under both Alternatives 1 and 2, no easement would be granted, and operation of the pipeline under federal land would cease.

The pipeline would be shut down prior to abandonment. This segment would be abandoned in place according to 49 CFR § 195.402(10) requirements, including purging the pipeline segment of oil and sealing it. A general outline of abandonment in place has been developed that estimates approximately 13 acres of disturbance for access and workspace, shown on Figure 2.5-3. This would include two temporary work areas (200 feet by 150 feet) for digging, cutting, purging, capping, and backfilling. The existing HDD tie-in locations inside the workspace would be used to cut the pipeline, purge it with a neutral gas (such as nitrogen) before being filled with water, and recap the pipeline. Access roads with a width of 15 feet would be required on the east and west sides for access to the workspaces. Excavated areas would then be backfilled and the pipeline abandoned in place, and disturbed areas would be restored to previous conditions. Abandonment activities would likely be completed in 1 year.

This alternative would not meet the Project purpose of the Applicant Proposed Action on its own and Dakota Access would likely plan to construct and operate a pipeline reroute; therefore Alternative 2 is considered throughout this document in connection with Alternative 5 (the North Bismarck Reroute).

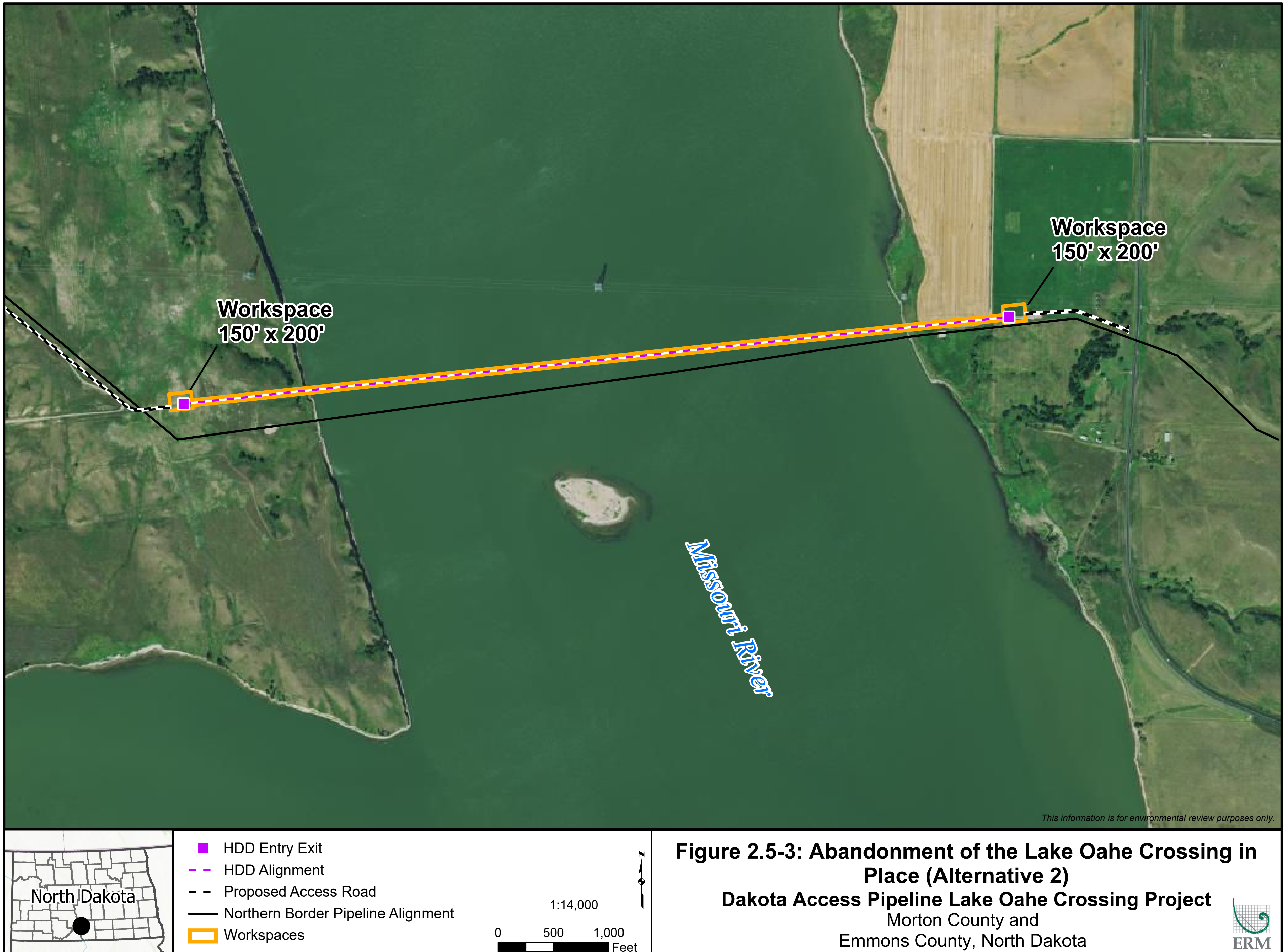

Figure 2.5-3: Abandonment of the Lake Oahe Crossing in Place (Alternative 2)

Dakota Access Pipeline Lake Oahe Crossing Project

Morton County and
Emmons County, North Dakota

ERM

REVISED: 09/13/2021 | SCALE: 1:14,000

2.6. ACTION ALTERNATIVES

2.6.1. Alternative 3: Grant Requested Easement Consistent with Vacated Easement Conditions (Applicant Proposed Action)

Under Alternative 3, the USACE would grant the requested easement to cross federal property under the MLA, 30 USC § 185, consistent with conditions of the now vacated easement issued on February 8, 2017. The easement would allow for the operation, maintenance, repair, replacement, and termination of the existing 30-inch diameter buried pipeline and the continued transport of crude oil from North Dakota to Illinois. The easement would cover a 50-foot width plus the ground occupied by the pipeline and related facilities as shown on Figure 1-1. The full text of the previous easement 36 conditions is provided in Appendix C, Scoping Report, and include, but are not limited to:

- Regular inspections and immediate maintenance must occur for any defects or leaks found in the pipeline.
- Mainline valves with remote control or automatic shutdown must be installed on either side of the lake crossing with additional mainline valves installed upstream, downstream, or both to protect the waterbody. (Mainline valves controlled remotely have been installed on both sides of the Lake Oahe crossing.)
- Supervisory Control and Data Acquisition (SCADA) System must be developed, installed, operated, and maintained to provide remote monitoring and control of the entire pipeline segment in accordance with 49 CFR § 195. (SCADA system was installed as part of the original Project construction and has been implemented and commercially in service since June 1, 2017.)
- Computational Pipeline Monitoring Lead Detection must be in place in accordance with 49 CFR § 195.134, and the pipeline segment must be operated as a continuously pressurized pipeline. (LeakWarn was installed and was commercially in service on June 1, 2017, as part of original construction. Leak detection was upgraded to Atmos International on December 17, 2019, and is currently the software being used on DAPL.)
- Soil impacts would be minimized or avoided through implementation of the SPCC, SWPPP, and ECP.
- Pipeline segment overpressure protection must be limited to a maximum of 110 percent maximum operating pressure during surge events, consistent with 49 CFR § 195.406(b).
- The Initial Cathodic Protection system must be operational within 6 months of placing the pipeline in service and would be operated and maintained. (This item was implemented in the area of Lake Oahe either prior to or within 6 months of the commercial in-service date of June 1, 2017.)
- Interference Current Surveys must be performed over the entire pipeline segment within 6 months of placing the pipeline in service. This item was implemented in the area of Lake Oahe either prior to or within 6 months of the commercial in-service date of June 1, 2017.)

- Corrosion Surveys must be completed within 6 months of placing the Cathodic Protection system in operation. (This item was implemented in the area of Lake Oahe either prior to or within 6 months of the commercial in-service date of June 1, 2017.)
- Within 3 years of placing a pipeline segment in service, a baseline Initial Inline Inspection must occur using a high-resolution Magnet Flux Leakage tool, high resolution deformation tool, and an ultrasonic crack detection tool or equivalent of each. (On May 17, 2018, Dakota Access ran a Deformation / Magnetic Flux Leakage / Inertial Measurement Unit Tool on the pipeline; on June 13, 2018, Dakota Access ran an Ultrasonic Crack Tool).
- Future Initial Inline Inspections must occur based on pipeline segment integrity threats and be performed on the entire pipeline on a frequency consistent with 49 CFR § 195.452(j)(3) assessment intervals.
- Basic sediment and water in the pipe must be limited to a 0.5 percent by volume, and testing results must be reported in the annual report.
- Pipeline Patrolling must occur along the segment right-of-way on a 2-week interval but not exceeding 3 weeks for at least 26 times each calendar year to inspect for excavation activities, ground movement, soil stability, wash outs, leaks, or other activities or conditions affecting the safe operation of the pipeline segment. (The pipeline is inspected by weekly aerial patrols unless prevented due to inclement weather. In the event of inclement weather, the line is flown as soon as weather permits but not to exceed 21 days.)
- Full-scale open water and full-scale winter/ice exercises would occur once every 3 years, with the location and type of exercise on alternating schedules and the first exercise occurring within the first 3 years after the pipeline is operational. (In August of 2016, a swift water drill was performed on the Missouri River. In March of 2019, winter ice response drill was performed on Lake Oahe. Based on correspondence with Dakota Access, the drill exercises alternate between the two locations DAPL crosses the Missouri River. The next drill exercise to be performed in 2025 will be on Lake Oahe.)
- An all-weather access and collection point downstream of the HDD crossing at Lake Oahe would be provided within 1 month of the pipeline becoming operational.

This alternative would not require any additional construction activities within the Project Area, and the pipeline would be operated and maintained as described in the 2016 EA. Dakota Access would implement monitoring plans, routine inspections, and maintenance in compliance with state and federal permitting requirements.

The EPA requested that the status of Dakota Access's compliance with the existing easement special conditions to date be identified. Dakota Access currently operates the pipeline under the 36 easement conditions and additional implemented safety measures discussed in Section 2.6, Action Alternatives, below. To date, the USACE has not identified any non-compliances with the existing easement conditions.

2.6.2. Alternative 4: Grant Requested Easement with Additional Conditions

Alternative 4 is similar to Alternative 3 (the Applicant Proposed Action), as the USACE would grant the requested easement allowing for the operation, maintenance, repair, replacement, and termination of the Project; however, the easement would be granted with additional conditions and modifications. The easement area would be the same as depicted on Figure 1-1. Coordination with cooperating agencies and Tribes, review of the original easement conditions, additional analysis developed during this EIS, scoping comments received, and commitments made by Dakota Access have contributed to the development of additional conditions beyond those included in the originally granted easement.

Several comments were received during scoping regarding additional conditions that could be added to the easement if granted. These conditions included general suggestions to improve pipeline safety (such as leak detection) and reduce emissions. Multiple commenters suggested Dakota Access be required to implement compensation measures to offset impacts on the SRST water supply and livelihoods. For example, funding of an alternative drinking water source hooked up to a tribal distribution system with funding for lifetime maintenance. Another commenter suggested that Congressional legislation be enacted to require Dakota Access to be held responsible for damages, including environmental damages, in perpetuity. Congressional legislation is already in place; under the Oil Pollution Act of 1990 and the National Oil and Hazardous Substance Pollution Contingency Plan (40 CFR § 300), and Dakota Access is liable for the costs associated with the containment, cleanup, and damages resulting from a release. Dakota Access maintains financial responsibility for the duration of the response actions. Within the scope and authority of the USACE, these comments have been considered, and additional conditions to the easement are included under Alternative 4.

Based on coordination with cooperating agencies and Tribes, review of the Project in this EIS, and in consideration of scoping comments, the USACE has developed the following additional easement conditions associated with Alternative 4. The easement conditions identified below would become requirements when added to the easement. The additional easement conditions are identified and explained throughout the analysis in Chapter 3 of this EIS, and include:

- Dakota Access shall develop a plan for how it will aid water intake users affected by disruptions to access safe, clean water sources in the event of a crude oil release from DAPL at the Lake Oahe crossing. First, the plan shall provide procedures for supplying an alternative source of clean, safe water to any affected water intake users for agricultural applications and drinking water in the event a crude oil release should occur from DAPL at the Lake Oahe crossing until the release is cleaned up and water at the intake is clean and safe for the applicable uses. Second, if agricultural water cannot be provided to affected users due to limited resources and prioritization of drinking water, the plan shall provide details on how Dakota Access will compensate users of agricultural water. The plan shall specify procedures for establishing baseline water quality parameters and will set forth numeric criteria for response actions based on relevant standards. The plan shall specify that water supplied to affected communities will adhere to the EPA National Primary Drinking Water Regulations primary standards to protect public health by limiting the levels of contaminants in drinking water. The plan shall specify that standards for the following contaminants will target the EPA's Maximum

Contaminant Level Goals (MCLGs)[21] and at a minimum will be below the EPA's set Maximum Contaminant Levels (MCLs).[22] These contaminants include, but are not limited to, hydrocarbons antimony, selenium, ethylbenzene, ethylbenzene, ethylene dibromide, toluene, methyl tert-butyl ether, benzene, and xylenes. Further, the plan shall specify that Dakota Access will supply water to affected communities until regular laboratory testing shows that levels of contaminants associated with crude oil and/or petroleum-based hydrocarbons in water supplied by affected intakes are at a minimum below the EPA's set MCLs for relevant contaminants, including but not limited to hydrocarbons (e.g., gasoline range organics [GROs] / diesel range organics [DROs]), antimony, selenium, ethylbenzene, toluene, benzene, and xylenes.

- To confirm there is no contamination of groundwater from an undetected pipeline release at the Lake Oahe crossing, Dakota Access shall develop a groundwater monitoring plan and install and maintain a groundwater monitoring network within surficial aquifers connected to Lake Oahe to monitor for the presence of petroleum-based hydrocarbons (specifically GROs/DROs). The plan shall specify the location and extent of the network based on regulatory expertise (e.g., North Dakota Department of Environmental Quality [NDDEQ]). If there is any increase in hydrocarbon levels or detection of visible oil, Dakota Access shall immediately inspect the pipeline for leaks. Dakota Access shall make sampling results publicly available online, and an annual report summarizing monitoring results shall be provided to the USACE, the NDDEQ, and interested Tribes.
- To confirm there is no contamination of aquatic habitats from an undetected pipeline release at the Lake Oahe crossing, Dakota Access shall conduct biannual visual surveys, surface water sampling, and sediment and/or benthic macroinvertebrate (BMI) sampling at the Lake Oahe crossing to monitor for the presence of petroleum-based hydrocarbons (specifically GROs/DROs). A lake-bottom visual survey using an underwater video camera or sonar shall be conducted along the entire length of the pipeline centerline across Lake Oahe. At least three surface water and sediment/BMI samples each shall be taken along the pipeline centerline from areas identified as having a greater potential for transmitting oil, such as from where the underlying clay layer is not as thick or from nearshore areas. Sampling and surveys shall be performed immediately following ice breakup in the spring and in the fall prior to the lake freezing over. Any increase in hydrocarbon levels or detection of visible oil will prompt Dakota Access to immediately inspect the pipeline for leaks. Dakota Access shall make sampling results publicly available online, and an annual report summarizing monitoring results shall be provided to the USACE, the NDDEQ, and interested Tribes.
- Should a crude oil release occur from DAPL at the Lake Oahe crossing, Dakota Access shall conduct polycyclic aromatic hydrocarbon (PAH) fish tissue sampling, in accordance with sampling protocols that the State of North Dakota is utilizing for its monitoring program on the lake for methyl-mercury analysis, to support when PAH levels in fish return to pre-release conditions. Fish samples collected for PAH tissue analysis shall include all species potentially taken for subsistence by the Tribes. Tissue samples collected for analysis shall align with how fish are typically prepared for consumption

[21] The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
[22] The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

in the area; generally, this involves skin-on fillets for scaled fish and skinless fillets for scaleless species. If whole fish are regularly consumed, whole-body samples shall be collected. Testing results shall be made publicly available online and be provided to the USACE, the NDDEQ, and interested Tribes. If current tissue concentrations have not been assessed, Dakota Access shall collect baseline samples to determine when elevated levels of PAHs in fish return to baseline conditions should a crude oil release occur.

- In the event of any required remediation activities, Dakota Access shall conform to the National Bald Eagle Management Guidelines and minimize off-road vehicle traffic within 660 feet of bald eagle observations, where feasible (USFWS, 2007).
- Dakota Access shall implement improved leak detection systems for the Lake Oahe crossing as new technology becomes available and implement frequent drills and simulations for emergency response and preparedness with potentially affected communities in the event of a release incident. Dakota Access shall evaluate and implement new leak detection technology based on a review of industry-wide commercially available and economically feasible technology every 5 years. The technologies shall have a proven record of success for an equivalent application before being required.
- Dakota Access shall develop and implement a plan for food distribution to environmental justice communities that rely on traditional subsistence resources in the event of a crude oil release from DAPL at the Lake Oahe crossing that affect the availability of wild caught subsistence resources to minimize potential community hunger.
- Within 6 months of easement issuance, Dakota Access shall facilitate a separate meeting(s) (offering several date and time options) with the SRST and the CRST to discuss each Tribe's interest in undertaking systematic subsistence studies. More than one meeting with each Tribe may be needed to discuss the potential for a community-based participatory study. The purpose of the studies would be to develop a baseline of subsistence use (e.g., season of use, species harvested, number of households using each species harvested) on the federal lands and waters at the Lake Oahe crossing. Dakota Access shall document efforts to coordinate each meeting and provide a summary of meetings held. If the Tribes do not wish to participate in a meeting and/or systematic subsistence studies, Dakota Access will have no further requirements. If the Tribes are interested in undertaking subsistence studies on the federal lands and waters, a study plan shall be developed and implemented. The plan and reports of the subsistence study results will be shared with the USACE.

Further, Dakota Access has voluntarily implemented the following additional measures, which are currently operational, and Dakota Access has stated will continue to be implemented:

- Enhanced safety systems
  - Communications backup: To ensure that Control Center operators have continual control of the valves in the event primary communications are lost during adverse weather conditions or other events, Dakota Access already has secondary communications in place. Dakota Access also implements a third communications system as backup to these existing primary and secondary communications systems by contracting for concurrent service with a different provider.

- Backup power for remotely actuating the Lake Oahe Valves: The valves at Lake Oahe currently have backup power capable of maintaining communications in case of a primary power failure and actuating the valves on each side of Lake Oahe in the event primary power is lost. With this additional measure, it is possible to remotely close the valves in the event of a simultaneous leak and primary power failure.
- Immediate manual valve shutoff capability: To further ensure that the valves could be rapidly shut off in any incident, Dakota Access has adjusted its protocols to automatically dispatch personnel to the valves if two of three communication methods are lost. Personnel would remain on-site until at least two of three communication methods are back in place. This would ensure that personnel would be in place to manually shut off the valves immediately in the event that four things occur simultaneously: primary communications are lost; secondary communications are lost; tertiary communications are lost; and an incident occurs.

- Additional monitoring measures:
  - Increased frequency of ground-level inspections: Dakota Access personnel will perform periodic ground-level inspections of the pipeline and the valves on either side of Lake Oahe with protocols requiring personnel to conduct ground-level inspections of the Lake Oahe crossing at least three times per week, conditions permitting.
  - Continuous video surveillance of the Lake Oahe valve sites: Video-surveillance equipment is in place at the Lake Oahe valves that is monitored in the event a motion-activated alarm is triggered. Dakota Access expanded that surveillance to include a continuous video feed of the Lake Oahe valve sites to be monitored on a 24-hour daily basis from Dakota Access's Central Monitoring facility.

This alternative would not require any construction activities within the Project Area. These additional measures generally result in increased operational safety of the pipeline and facilitate incident notification and shutdown procedures. Additional on-ground inspections at the crossing require additional personnel to be on-site on a weekly basis.

2.6.3. Alternative 5: North Bismarck Reroute

Under Alternative 5, the USACE would not grant an easement to cross federal property at Lake Oahe, and a rerouted pipeline would be constructed north of Bismarck, North Dakota. Alternative 5 presents a reroute of the DAPL Project and results from the abandonment of the Lake Oahe crossing under Alternative 1 or 2. Throughout this EIS, the combined impacts of Alternatives 5 and 1 and Alternatives 5 and 2 are presented at the end of each discussion of Alternative 5 in the applicable resource impact analyses. Route alternatives were evaluated in the 2016 EA for the Project, but commenters have raised concerns with the adequacy of those alternative route selections. In developing the range of alternatives for this EIS, the USACE considered the possibility of a pipeline reroute and the likely route such new pipeline might take. This led to consideration of a reroute north of Bismarck, North Dakota. While the USACE does not have jurisdiction to approve pipeline routing off of its federal lands, this EIS can examine alternatives outside of USACE jurisdiction. Review of the rerouted pipeline alternative provides a fresh, updated review compared to the 2016 EA analysis. This EIS focuses on the effects of the alternatives to an easement across USACE federal property.

During the scoping period for this EIS, commenters requested that a reroute be considered, with some requests for further evaluation of a route located north of Bismarck, North Dakota, in particular. If an easement is not granted, it is likely that Dakota Access will pursue a pipeline reroute. For the purposes of this NEPA analysis, the North Bismarck Reroute initially evaluated in the 2016 EA is being used as a proxy to analyze impacts associated with a reroute, although the exact route that Dakota Access would seek is unknown. The USACE notes it has no jurisdictional authority to require Dakota Access to construct a reroute off its property. However, should Dakota Access pursue a reroute, that route would be subject to any applicable federal, state, local, or tribal permitting processes, including public outreach.

The State of North Dakota objects to the addition of a fifth alternative. The state stresses that the alternative was not identified in the NOI and was not subject to public comment during scoping and was developed without cooperating agency or public input. The state prefers that a discussion of a reroute be analyzed as an indirect impact of Alternatives 1 and 2. Alternative 5 was developed as a result of public scoping following the publication of the NOI, which requested public input on potential additional alternatives. As mentioned above, several commenters and Tribes requested that a route north of Bismarck be evaluated. Further, Dakota Access' response to information requests from the USACE states that any conceptual abandonment of the Lake Oahe crossing will need to include a replacement pipeline segment. Due to the significant public interest in analyzing an alternate route and the information provided by Dakota Access, the USACE developed Alternative 5 as a separate alternative, which includes by reference the abandonment of the pipeline under Alternatives 1 or 2. Throughout this EIS, resource impacts are identified combining Alternatives 5 and 1 and Alternatives 5 and 2. The USACE provided an opportunity for cooperating agencies to review preliminary drafts of the EIS and provide direct input into the language of the document, starting in July 2021. These early working drafts included Alternative 5. The USACE finds that separating the reroute into its own alternative helps to clarify effects and address the requests received during scoping. While the USACE does not have jurisdiction over pipeline siting outside of its federal lands, NEPA implementing regulations contemplate that an EIS will include reasonable alternatives that are not within the jurisdiction of the lead agency (40 CFR § 1502.14(c)). As is discussed below, this EIS also combines the effects of Alternative 5 with Alternatives 1 and 2 to present a comprehensive analysis of the varying effects that could occur.

Because a pipeline has already been constructed under Lake Oahe, the pipeline would need to be rerouted to follow a route north of Bismarck; this EIS refers to this alternative as the North Bismarck Reroute. This alternative route would be 111 miles long and approximately 50 miles north of the Project location, beginning in Mercer County, North Dakota, where it would connect to customer receipt points and head southeast through Oliver, Morton, Burleigh, and Emmons counties, crossing the Missouri River approximately 8.5 miles up-river of Bismarck/Mandan, shown on Figure 2.6-1. The 2016 EA analyzed this route in terms of overall route mileage; co-location with existing pipelines and powerlines; floodplains, wetlands, and waterbody impacts; as well as PHMSA high consequence areas (HCA). HCAs are used in pipeline safety regulations to identify locales where a pipeline release could have the greatest adverse impact.[23]

The North Bismarck Reroute is approximately 11 miles longer than the existing route and requires a greater number of floodplain, wetland, and waterbody crossings. The route is co-located with other utilities for 3 percent of the route versus 41 percent for the constructed and existing route, resulting in increased greenfield area impacts. The alternative route crosses through or in close proximity to several wellhead source water protection areas. Both the alternative route and the existing route are located within the mapped South Central Regional Water District (RWD) source water protection area (NDDEQ, 2021a). Both the North Bismarck Reroute and the Applicant Proposed Action cross HCAs. Based on the analysis in the 2016 EA, the North Bismarck Reroute would cross 4.2 total miles of HCAs and the Applicant Proposed Action crosses 2.6 total miles of HCAs (including the current crossing of Lake Oahe as an HCA). Environmental justice was considered as a factor in the 2016 EA and 2018 Remand Analysis for elimination of this alternative in terms of construction-related and normal operating impacts. These assessments stated that the route north of Bismarck would contain more potentially affected minority individuals, and water intakes would be at a greater risk. Impacts from a release on water intakes and associated users under this and the existing crossing location are discussed in Section 3.3, Water Resources. Although environmental justice is one of the factors relevant to the consideration of this alternative, the route was eliminated in the 2016 EA based on increased impacts on the human environment (e.g., floodplain, wetland, and greenfield impacts). The geographic area evaluated for environmental justice is larger in this EIS than was considered in the 2016 EA. Environmental justice is discussed in Section 3.8, Socioeconomics, Environmental Justice, and Health.

The State of North Dakota also opposes this alternative route, stating that this route has previously been evaluated, conflicts with the analysis performed by the state, and the current Lake Oahe route was selected as preferable. If a reroute is pursued, Dakota Access would likely perform a routing analysis to identify a detailed reroute and would need to seek approval from the NDPSC for a reroute, along with any other federal, state, or local authorizations required.

The State of North Dakota noted that the NDPSC issued a Certificate of Corridor Compatibility and Route Permit for the current location of the pipeline on January 20, 2016. This decision was based on public input and extensive review of alternative routes and transportation technologies in a legal proceeding involving 34 landowner interveners and intervention by North Dakota Pipeline Company, LLC. The Optimization Project also provided an opportunity for persons to intervene and subject the NDPSC's order to appeal. SRST intervened in this proceeding. The NDPSC approved the current route location based on the following conclusions:

- The location, construction, and operation of the Lake Oahe crossing would produce minimal adverse effects on the environment and upon the welfare of the citizens of North Dakota.

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[23] PHMSA recognizes three types of HCAs, including drinking water, populated, and unusually sensitive ecological HCAs. Populated HCAs include high population areas and other populated areas defined by the U.S. Census Bureau as “urbanized areas” and “designated places.” Ecological HCAs are areas where federally listed threatened and endangered species and migratory waterbirds are found. Drinking water HCAs are sources supplied by surface water or wells where there is not a secondary source of water available. Areas in which hazardous liquid could affect the water supply are also considered HCAs by PHMSA. (PHMSA, 2011)

- The location, construction, and operation of the Lake Oahe crossing is compatible with the environmental preservation and the efficient use of resources.
- The Lake Oahe crossing would minimize adverse human and environmental impact while ensuring continuing system reliability and integrity and ensuring that energy needs are met and fulfilled in an orderly and timely fashion.
- The Lake Oahe crossing is of such design and location that it would produce minimal adverse effects as defined under North Dakota Century Code section 49-22-07.2.

Past analysis from the state assumed the Lake Oahe crossing location was an available option in weighing preference; however, under Alternative 5, the USACE would reject the easement at this location; therefore, the state may need to reconsider another crossing location under the premise that the Lake Oahe crossing is not available.

Because further analysis of a route north of Bismarck was requested by commenters in the scoping period for this EIS, and commenters identified flaws in the past analysis, specifically with how environmental justice communities were identified and evaluated, this EIS includes additional evaluation of the reroute as an alternative to the Applicant Proposed Action. However, the current route has been constructed. Therefore, the North Bismarck Reroute at this time would require construction and operation of an additional 111 miles of pipeline. The North Bismarck Reroute is estimated to result in approximately 1,200 acres of new temporary construction impacts, including one mainline valve per each 10-mile segment, and 700 acres of permanent right-of-way in greenfield areas. The additional analysis evaluates impacts on land use types, populated areas, and sensitive resources and environmental features such as aquatic resources, critical habitat, source water protection areas, wells, and sensitive groundwater areas, which are displayed in Appendix D, Alternative 3 Easement Special Conditions. These features were considered to be resources of importance from a public and environmental perspective and are evaluated in more detail throughout the EIS. This alternative would also require additional workspace and associated impacts necessary for the abandonment of about 100 miles of the existing pipeline. Dakota Access would need to acquire federal, state, and local permits for the approval of this alternative, including a new certificate of corridor compatibility and route permit from the NDPSC, which could take a minimum of 2 years.

In addition, implementation of Alternative 5 would require that the existing pipeline be abandoned. Therefore, Alternative 5 also includes the impacts associated with removal or abandonment of the existing pipeline (Alternatives 1 and 2) and transportation via truck and/or rail during construction, as is discussed above. The number of trains and trucks that would be used as a substitute for the pipeline would be affected by the availability of those modes of transportation and the cost of those modes of transportation as compared to the pipeline, which would affect the amount of oil transported. Notably, details on construction of new or modification of existing loading/offloading facilities, their location, and timing (as discussed in Section 2.4, Alternative Transportation Methods) are not reasonably foreseeable under the NEPA definition[24] (43 CFR § 46.30); therefore, the impacts associated with construction and operation of these facilities are not analyzed in association with Alternative 5. Furthermore, facility construction and/or modification may not be possible during the interim timeframe that the DAPL Project would be shut down during permitting and construction of a re-route (estimated to be 2 to 4 years with an average of 3 years). If Project shippers would seek to transport the oil using rail or trucking during this interim timeframe, this EIS assumes that existing transportation infrastructure would be used. As a result, a lack of loading and unloading capacity is identified as a substantial constraint to accommodating the current (or optimized) DAPL capacity via trucking and/or rail. Throughout this EIS, Alternatives 1 and 2 include cross references to Alternative 5, acknowledging that these alternatives are tied together and the combined impacts of Alternatives 5 and 1; and Alternatives 5 and 2 are presented at the end of each discussion of Alternative 5 in the applicable resource impact analyses.

[24] Reasonably foreseeable future actions include those federal and non-federal activities not yet undertaken, but sufficiently likely to occur, that a Responsible Official of ordinary prudence would take such activities into account in reaching a decision. These federal and non-federal activities that must be taken into account in the analysis of cumulative impact include, but are not limited to, activities for which there are existing decisions, funding, or proposals identified by the bureau. Reasonably foreseeable future actions do not include those actions that are highly speculative or indefinite (https://www.ecfr.gov/current/title-43/subtitle-A/part-46/subpart-A/section-46.30).

Alternative 5 Route
Existing Route
Standing Rock Sioux Reservation
Federal Land
County Boundary

North Dakota

0 5 10 Miles

Figure 2.6-1: North Bismarck Reroute (Alternative 5)
Dakota Access Pipeline Lake Oahe Crossing Project

North Dakota

ERM

REVISED: 07/12/2021 | SCALE: 1:700,000

3. AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION

As required by NEPA, this chapter presents the affected environment as it was in 2016, impacts that occurred as a result of construction of the Lake Oahe Crossing, the current affected environment, and impacts associated with each of the five alternatives. This chapter is organized by resource topic with the current status of the affected environment and the construction and operational impacts of each alternative described within each resource section. Affected environment and impacts are generally divided into sub-sections described as follows.

- **Project Background: Affected Environment and Impacts**—Introduces the resource; describes the affected environment, including aspects of the human environment in 2016 (pre-construction) as well as a description of the impacts that have already occurred during construction and operation; and provides an assessment of significance of those past impacts.
- **Current Affected Environment**—Describes the current environmental conditions resulting from the impacts that occurred during construction in 2017 and operation to date. This section includes any updates to the affected environment such as changes in the status of a resource, changes in the way a resource is regulated, or other non-Project related impacts on the affected environment.
- **Impacts and Mitigation**—Describes the impacts that each alternative would have on the current affected environment (including both construction and operational impacts), identifies applicable mitigation measures, and assesses the significance of impacts of each alternative compared to the current affected environment.

The following are considered when determining the significance of an impact: the duration of the impact; the intensity (e.g., severity) of the impact; and the geographic, biological, and/or social context in which the effects would occur. The context and intensity vary by resource and impact.

When considering the environmental consequences of the Project, the duration of each potential impact is described according to the following four levels: temporary, short-term, long-term, and permanent. These terms are defined as follows.

- **Temporary** impacts generally occur for about 1 year, with the resources returning to pre-construction conditions almost immediately.
- **Short-term** impacts generally occur for 1 to 3 years.
- **Long-term** impacts generally occur for more than 3 years, but resources would eventually recover to pre-construction conditions.
- **Permanent** impacts are defined as activities that modify a resource to the extent that the resource may not return to pre-construction conditions.

Context means considering the extent of the impact such as in a national, regional, or local setting. Intensity refers to the severity of the impact in whatever context(s) it occurs. To determine intensity, the severity of the impact is considered using both the quantity of the resource affected as well as impact duration.

In determining intensity, the following ten factors are considered (40 CFR § 1508.27(b)):

1. Impacts that may be both beneficial and adverse;
2. The degree to which the Applicant Proposed Action affects public health or safety;
3. Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas;
4. The degree to which the effects on the quality of the human environment are likely to be highly controversial;
5. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks;
6. The degree to which the Applicant Proposed Action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration;
7. Whether the Applicant Proposed Action is related to other actions with individually insignificant but cumulatively significant impacts;
8. The degree to which the Applicant Proposed Action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources;
9. The degree to which the Applicant Proposed Action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973; and
10. Whether the Applicant Proposed Action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Impacts described in this EIS are considered adverse unless otherwise stated. This EIS uses the terms negligible, minor, moderate, and major to describe intensity in relation to significance, as defined in Table 3-1.

Table 3-1: Intensity Definitions

Intensity	Impact Perceptibility (Visually Noticeable or Measurable)	Overall change in resource character or value?	Can resource be relied upon for current use?
Negligible	Not perceptible	No	Yes
Minor	Barely perceptible	No	Yes
Moderate	Indisputably perceptible	Yes	Yes
Major	Indisputably perceptible	Yes	No

Considering context and duration described above, this EIS considers resource impacts that are unrelated to a crude oil release as significant if the impacts would result in a permanent, and major adverse change in the physical environment. Certain resources include a more detailed definition of impact methodology to determine whether an impact is significant. The rationale for why an impact is considered to fall under one of the preceding intensity descriptors is included in each resource section. Statements of significance are supported by text describing the context and intensity of the impact and are summarized at the end of each resource section. Resource impacts specific to Tribes are discussed within each applicable resource section. Cumulative impacts are described in Chapter 4.

Many comments received during scoping requested a robust analysis of impacts associated with crude oil releases under varying scenarios, including a worst-case discharge (WCD) scenario. Commenters also stated that the impacts of a release would be catastrophic and that a release presents a significant risk; therefore, the pipeline should be shut down and an easement denied. However, it is important to consider that the risk associated with a particular hazard is based on a combination of the consequence (or impact) of that hazard and the frequency (or likelihood) that the hazard will occur, which may include mitigating factors. For example, to illustrate how risk and balancing consequence and likelihood is considered, on a hot and sunny day, individuals venturing outside may be susceptible to heat stroke. While the consequence of heat stroke may be high (e.g., hospitalization or death), the likelihood of getting heat stroke may be low based on mitigating factors (e.g., staying hydrated, using sun protection, or limiting the length of time outside). As such, the resulting risk of experiencing heat stroke may be perceived as tolerable or not significant.

New spill modeling and WCD scenarios have been modeled for this EIS, which contemplate a wide range of possible scenarios (see Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Modeled Release Scenarios). For each resource area, the USACE has evaluated the impact (using the criteria above) and significance of a WCD release. This EIS uses a risk matrix (Figure 3-1) to identify the significance of impacts associated with a crude oil release at Lake Oahe. The significance is based on the consequences of the release and the likelihood that the release would occur. The risk matrix identifies the likelihood that a particular type of crude oil release would occur (e.g., a WCD) while taking into account site-specific mitigation measures, ranging from remote to likely against the impact intensity of a release ranging from no or negligible to major. The matrix is then color coded and numbered to identify the combined risk level ranging from green (or number 1) representing a negligible risk to red (or number 4) representing a major risk. The risk may vary for each environmental resource. For example, a release scenario that has never occurred across industry and would not impact a particular resource would have a remote likelihood of occurrence and negligible impact resulting in a negligible risk. Similarly, a scenario that has a likelihood of occurring during the lifetime of the Project and would result in moderate impacts on a resource would result in a moderate risk. This EIS considers a risk of red (number 4) to equate to a significant impact under NEPA. The release scenarios are introduced and described in detail in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Modeled Release Scenarios.

Incomplete or unavailable information is addressed in this EIS in accordance with the CEQ guidelines (40 CFR § 1502.22).

Project Risk Matrix

Likelihood of Occurrence						
	> 1E-02/yr or More often than once every 100 years	**Likely:** exposure to this event can be frequent. Likelihood of occurring during lifetime of Project	1	2	3	4
	> 1E-04/yr and ≤ 1E-02/yr or Between once every 100 years and once every 10,000 years	**Unlikely:** exposure to this event is unlikely, but company has experienced this event with similar assets	1	2	3	4
	> 1E-06/yr and ≤ 1E-04/yr or Between once every 10,000 years and once every 1,000,000 years	**Very Unlikely:** exposure to this event is very unlikely, but industry has experienced this event with similar assets	1	1	2	3
	≤ 1E-06/yr or Less frequent than once every 1,000,000 years	**Remote:** not expected or anticipated to occur. Industry may have experienced no or a small number of these incidents	1	1	1	2
		Impact Intensity	**No Impacts/Negligible**	**Minor Impacts**	**Moderate Impacts**	**Major Impacts**
			Impact not perceptible; No overall change in resource character or value; Resource can be relied upon for current use	Impact barely perceptible; No overall change in resource character or value; Resource can be relied upon for current use	Impact indisputably perceptible; Overall change in resource character or value; Resource can be relied upon for current use	Impact indisputably perceptible; Overall change in resource character or value; Resource can not be relied upon for current use

Color Coding	Risk Ranking	Description
Green	1	Negligible Risk
Yellow	2	Minor Risk
Orange	3	Moderate Risk
Red	4	Major Risk

Sources: HSE, 2005; Lee et al., 2011

Figure 3-1: Project Risk Matrix

3.1. Reliability and Safety

The transportation of crude oil by pipeline has inherent risks to the public and environment. The greatest hazards are 1) a major pipeline rupture, resulting in considerable contamination of the environment, and 2) a fire or explosion resulting from a major pipeline rupture.

Crude oil pipelines often transport crude oil with a variety of different hydrocarbons present—some as light as methane with others having carbon chains exceeding 30 carbon atoms in length. The DAPL Project transports Bakken light, sweet crude, meaning crude consisting of hydrocarbons with relatively short carbon chains and low sulfur content. Specifically, Bakken crude contains primarily heptanes, found in gasoline, with small amounts of methane, ethane, propanes, butanes, pentanes, hexanes, and benzenes (Dangerous Goods Transport Consulting, Inc., 2014). All these compounds can be toxic if inhaled, contacted (dermal exposure), or ingested, most notably benzene (a compound that commenters expressed concern about). Benzene makes up approximately 0.08 percent of the total concentration in liquid volume for Bakken crude (Dangerous Goods Transport Consulting, Inc., 2014). However, this compound evaporates and volatilizes relatively quickly following release. In the event of a major pipeline rupture, the lighter, more volatile hydrocarbons that are buoyant in the atmosphere (i.e., will rise) such as methane and benzene are likely to disperse in air quickly, making ignition more difficult. Hydrocarbons such as propane or butane, which are more dense than air, may settle in valleys and low-lying areas, forming pockets of flammable material at or near the ground surface, before dispersing.

Heavier hydrocarbons would be in the liquid state. While ignition of this pool is unlikely, environmental contamination is possible, especially if exposed to a water source. Contamination of a water source can impact terrestrial and aquatic wildlife, as well as humans who rely on that water source for fresh water. While many components of the Bakken crude are considered “insoluble” such that the compounds would be more apt to float on the water surface rather than dissolve within the water column, a small fraction of the compounds may in fact dissolve. Among the various dissolved hydrocarbon (DHC) compounds, the most toxic components are the low molecular weight aromatics (i.e., monoaromatics and polycyclic aromatic hydrocarbons—also known as MAHs and PAHs). Non-aromatic hydrocarbons have a much lower solubility and typically result in lower effects (e.g., acute mortality) compared to aromatics. To be conservative, the specific chemical composition of the Bakken crude oil was used in the oil release modeling to assess the range of solubilities, volatiles, toxicities, and resulting effects on potential for acute mortality. This included the range of soluble and insoluble constituents that would behave and weather differently through time. Both DHCs and THCs (total hydrocarbon concentrations) were provided in the modeling, rather than compound specific values (e.g., benzene) because of the different behaviors. Over a matter of hours, lighter compounds such as benzene would evaporate from the water column into the atmosphere, and any continuing effects would result from heavier compounds that may dissolve or remain as whole oil (e.g., higher molecular weight compounds and residual fractions such as asphaltenes, and resins).

Contamination of soil can damage vegetation, agriculture, and terrestrial life. These effects could impact humans who rely on fertile soil to grow crops or keep wild game healthy. This section provides an assessment of compliance with pipeline design criteria, pipeline safety, and a release frequency analysis as well as an analysis of the affected area, impacts, and mitigation from the past and future Project activities under the five alternatives (see Chapter 2, Alternatives) related to pipeline reliability and safety.

3.1.1. Pipeline Safety

The DOT is mandated to provide pipeline safety under 49 USC 601. The DOT's PHMSA administers the national regulatory program to ensure the safe transportation of hazardous materials by pipeline. PHMSA develops safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, maintenance, and emergency response of pipeline facilities. Many of the regulations are written as performance standards, which set the level of safety to be attained and allow the pipeline operator to use various technologies to achieve safety.

The PHMSA ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. A state may act as the DOT's agent to inspect interstate facilities within its boundaries; however, the DOT is responsible for enforcement actions.

The DOT pipeline standards, published in 49 CFR 190–199; Parts 194 and 195 specifically, address the federal safety standards for transportation of oil by pipeline. DOT has the exclusive authority to promulgate federal safety standards used in the transportation of oil.

Pipeline operators are required to determine the risks to HCAs crossed by their pipelines. Under 49 CFR 195.450, an HCA is defined as any area that meets one of the following:

- A *commercially navigable waterway,* which means a waterway where a substantial likelihood of commercial navigation exists;
- A *high population area,* which means an urbanized area, as defined and delineated by the U.S. Census Bureau, that contains 50,000 or more people and has a population density of at least 1,000 people per square mile (mi^2);
- An *other populated area,* which means a place, as defined and delineated by the U.S. Census Bureau, that contains a concentrated population, such as an incorporated or unincorporated city, town, village, or other designated residential or commercial area; and
- An *unusually sensitive area,* which means a drinking water or ecological resource area that is unusually sensitive to environmental damage from a hazardous liquid pipeline release.

Lake Oahe fits the definition of an HCA. Therefore, Dakota Access is required to maintain an Integrity Management Program (IMP) for the Project under 49 CFR 195.452. This program should identify risks associated with the Project, a plan for conducting baseline assessments of the pipeline, and a continual process of assessment and evaluation to maintain a pipeline's integrity.

The USACE received comments during government-to-government consultation requesting information regarding Dakota Access' IMP and when PHMSA accepted the plan. Pipeline operators are required to develop and maintain an IMP, and PHMSA may review the written plan during inspections, but operators are not required to submit or receive approval of their written IMP plans. PHMSA's regulations do require reporting of "anomalous conditions" in the pipeline that may cause "integrity issues." 49 CFR 195.452(h),(m).

49 CFR 195.452(i) requires a pipeline operator to “take measures to prevent and mitigate the consequences of a pipeline failure that could affect a [HCA],” including through “conducting a risk analysis of the pipeline segment to identify additional actions to enhance public safety or environmental protection.” A risk analysis of the DAPL Project is conducted annually following IMP requirements.

Dakota Access performs a risk analysis annually on the Project Area based on the following nine threats that could result in a release into Lake Oahe:

1. Third-party damage
2. External corrosion
3. Internal corrosion
4. Pipe manufacturing defects
5. Construction related defects
6. Incorrect operations
7. Equipment failure/fatigue
8. Stress corrosion cracking
9. Natural forces

The SRST reviewed the risk assessment and identified the following points of concern:

- The risk assessment and 2016 EA did not account for the Dakota Access’ planned capacity expansion (Optimization Project) and its effects on the overall risk of the pipeline.
- The WCD volume in the assessment grossly underestimates reality and does not take into account the new capacity of the pipeline or a realistic shutdown time. This brings into question all later points of the assessment, such as release response planning.
- The Dakota Access risk assessment method is outdated and does not take into account the owner’s own safety/release record.
- Release models developed for the Project all utilize the underestimated WCD, meaning the model is inaccurate and any conclusions and response plans drawn as a result are unreliable.
- Adverse weather conditions have not been accounted for.

In consideration of the SRST challenges to the assessment, this EIS includes expanded analysis of safety matters and addresses the concerns listed by the SRST. In general, this EIS assumes compliance with PHMSA pipeline safety regulations, and that the PHMSA inspection program enforces compliance. MHA Nation reviewed the Preliminary Draft EIS and in response expressed that the Tribe has insisted on responsible development of oil and gas infrastructure and that DAPL has met these standards. MHA Nation expressed concern that a shutdown of DAPL would greatly reduce the level of safety for their Tribe.

The USACE received comments requesting information about how the mainline valves are tested while the pipeline is in service. Dakota Access performs testing and inspections of mainline valves in accordance with PHMSA regulations. Under 49 CFR 195.420, pipeline operators must maintain valves, in good working order, necessary for safe operation of the pipeline system at all times. Operators must inspect each mainline valve twice yearly to determine its functionality. Bypass or isolation valves are not necessary to test mainline valves as operators are not required to close valves fully during an inspection.

A minimum 25 percent valve closure is sufficient to demonstrate compliance, unless the operator has operational information that requires an additional closure percentage for maintaining reliability. Dakota Access has indicated that PHMSA audited and reviewed their valve maintenance during its April 29, 2019, through August 30, 2019, audit and found no adverse findings with respect to valve inspections at Lake Oahe (see also Section 3.1.3, [Reliability and Safety] Dakota Access and Energy Transfer Safety Record).

3.1.2. Pipeline Design

The pipeline must be designed, at the minimum, in accordance with 49 CFR 195. This includes, but is not limited to:

- Design temperature and pressure
- Valves and fittings
- Connections
- Leak detection
- Pressure testing
- Corrosion control
- General construction
- Operations and maintenance
- Pipeline depth of burial

In order to meet or exceed these minimum requirements, the following has been implemented on the Project:

- Pipe specifications that meet or exceed all applicable regulations, with a quality assurance program for pipe manufacturers;
- Heavier wall pipe with a thickness of 0.625 inch (exceeding by 45 percent the requirement of 0.429 inch) for the section of the pipeline underneath Lake Oahe;
- Inspections in each mill where pipe was produced for the DAPL Project to ensure compliance with all quality control measures;
- Use of the highest quality external pipe coatings (fusion bond epoxy) to reduce the risk of corrosion and stress corrosion cracking;
- Active Cathodic Protection applied to the pipeline and facilities;
- Increased areas of pipeline cover and separation along the pipeline corridor to provide maximum protection from third-party damages due to road maintenance, waterway erosion, farming, or utility encroachments in close proximity to the pipeline;
- Mainline valves installed on each side of Lake Oahe to reduce or avoid release effects to PHMSA-defined, HCAs;
- Four feet of soil cover over the buried pipeline on either side of the HDD crossings;
- Installation of the pipeline by HDD at Lake Oahe;
- Pipeline buried approximately 95 to 126 feet below the bottom of Lake Oahe; (exceeding 49 CFR 195 minimum requirement of 4 feet and the North Dakota Department of Water Resource’s minimum requirement of 24 feet by at least 91 and 71 feet, respectively); and

- Pipeline inspection and testing, including:
  - An IMP (rev. February 1, 2022) developed in accordance with 49 CFR 195.452;
  - Non-destructive testing of 100 percent of girth welds;
  - Hydrostatic testing of the pipe and mainline valves to 125 percent of the maximum operating pressure (MOP);
  - Inspection of the entire pipeline with an internal in-line inspection deformation tool;
  - Installation of all mainline valves with remote controlled actuation capability with redundant communication systems, allowing for optimized line control and isolation capabilities not found on older pipeline systems;
  - Continuous, real-time SCADA system pipeline monitoring that remotely measures changes in pressure and volume on a continual basis at all valve and pump stations; alarms operators in the event of adverse pressure changes, flowrate, and temperature discrepancies that could be attributable to potential leaks or releases; and allows for remote operation and shutdown of the pipeline, pumps, and valves;
  - A Computational Pipeline Monitoring (CPM) system that monitors the entire pipeline system for leaks via computational algorithms performed on a continual basis;
  - Periodic pipeline integrity inspection programs using internal inspection tools to detect pipeline diameter anomalies indicating excavation damage and loss of wall thickness from corrosion;
  - Close Interval Surveys, which are used to confirm the integrity of the pipeline cathodic protection system along the pipeline;
  - Aerial surveillance inspections at least every 10 days to detect leaks and releases as early as possible and identify potential third-party activities that could damage the pipeline;
  - Landowner outreach and implementation of a Public Awareness program;
  - Participation in “One-Call” and “Before You Dig” notification systems;
  - Sufficient resources and personnel in place to respond to any incident along the pipeline within 6 hours and mitigate any release effectively, including a release at Lake Oahe six times larger than the largest conceivable release;
  - A WCD scenario was calculated based on PHMSA’s pipeline safety regulations under 49 CFR 194.105. This calculation was conservative in that it assumed the pipeline crossed over Lake Oahe instead of under it, ignoring any mitigating effects of the now-cemented bentonite encasement around the pipeline and the approximately 95 to 126 feet of overlying aquitard, or relatively impermeable soils, between the pipeline and the lake bed of Lake Oahe. Based on this scenario, full-scale open water and winter WCD cleanup exercises would be conducted at Lake Oahe every 3 years. Other mitigation measures designed to respond to the WCD are a robust leak detection system (LDS) and automatic motor actuated valves on either side of the crossing;
  - Trained personnel in place to respond to a release in any season and under any weather conditions; and

- Periodic tabletop and live-action drills involving Dakota Access, the USACE, PHMSA, the EPA, the North Dakota Game and Fish Department, additional state, county, and local agencies, and the primary Oil Spill Response Organization (OSRO) in Dakota Access's Facility Response Plan (FRP) and Geographical Response Plan (GRP).

With these designs, Dakota Access is equipped to prevent, detect, respond to, mitigate, and clean up any release effectively as required by 49 CFR 195.

Some commenters asked about the designed lifetime of the pipeline and its safety features. Dakota Access indicates that when properly maintained, modern day steel pipelines can operate for an indeterminate period of time and, as such, there is no designed lifetime for the pipeline. Dakota Access uses the design and operation measures summarized above to meet or exceed regulatory requirements for pipeline design.

Commenters also asked whether meters could be added on each side of the Lake Oahe crossing to measure flow as a backup leak detection method. The valves on the Lake Oahe segment contain a built-in SCADA LDS that utilizes pressure and temperature sensors to detect leaks of less than 1 percent of flow in under an hour. The SCADA system collects pipeline pressure, flow, temperature, and other indicators every 6 seconds and alarms when it detects a breach from a sudden change in flow and pressure. Flow meters would be less accurate than the current LDS and are typically used at custody points on pipelines rather than as a LDS. Flow meters cannot be installed on either side of Lake Oahe due to physical and site limitations as they require a minimum length of straight pipe immediately prior to and after the meter installation location. Additionally, an inline flow meter would prevent the use of in-line inspection tools, like pigs, to inspect this segment of the pipeline.

3.1.3. Dakota Access and Energy Transfer Safety Record

Many commenters and the SRST stated that Energy Transfer's safety and release record should be taken into account when considering pipeline safety. The DAPL Project transports more than 200 million barrels (bbls) of oil per year. Since the start of operation, Dakota Access has not had a crude oil release on the DAPL Project mainline, including the Project Area. During this time, there have been ten incidents (not including six incidents from the ETCO Pipeline) that occurred at DAPL Project aboveground facilities, with six incidents occurring in the first year of operation and none involving more than 5 bbls of released crude. The six incidents within the first year of operation were due to commissioning issues resulting in leaks at pumping stations, all located away from waterways and sensitive areas, and have all been systematically addressed. Two of the incidents resulted in minor releases having minor impacts outside of DAPL Project aboveground facility properties (one involved the misting of 1.5 bbls of crude oil inside and outside the fenced valve site, and the other involved a less than 0.5 bbl release from a ball valve), and both releases were quickly and efficiently remediated, according to Dakota Access. All crude oil from these eight releases was recovered.

As of July 2020, PHMSA has also conducted 625 field days of pre-construction, construction, and operational inspection of the DAPL Project (with 550 of these field days having a major focus on the HDD crossing of Lake Oahe) and confirmed that the pipeline is in compliance with all applicable pipeline safety regulations (*Standing Rock Sioux Tribe et al., v. United States Army Corps of Engineers*, July 2020).

The SRST provided a recent incident report from PHMSA. As of July 22, 2021, PHMSA had identified the following seven categories of potential violations across the DAPL Project (PHMSA, 2021b), several of which had multiple offenses:

1. Valves used for drainage of stormwater were not accessible from outside of the tank dike as required by the National Fire Protection Association *Flammable and Combustible Liquids Code* (NFPA 30) at six facilities;
2. Operators allowed the setpoints of nitrogen-operated relief valves to fluctuate by not accounting for sources of nitrogen pressure fluctuation;
3. Energy Transfer failed to follow, prepare, and maintain its *Operations and Maintenance* manual;
4. Energy Transfer failed to set its protective equipment at its Johnson's Corner pump station in accordance with its surge study to control the pressure from exceeding 110 percent of the MOP;
5. Energy Transfer failed to inspect and test the overpressure safety relief valve at the Redfield station during the calendar year 2018;
6. Energy Transfer failed to follow the supplemental requirements of API RP 1162, and did not provide justification in its public awareness program or procedural manual as to why compliance with all or certain provisions of the recommended practice was not practicable or necessary for safety; and
7. Energy Transfer failed to continually change its IMP to reflect operating experience and failed to evaluate the consequences of a failure on the HCA when it identified which pipeline segments could affect an HCA.

While none of these potential violations were cited specific to the Lake Oahe crossing, which is the only portion of the pipeline captured in the scope of this EIS, some of these infractions could represent systemic issues that could also occur within the Project Area. Specifically, items 2, 4, and 5 introduce concern about Energy Transfer's ability to properly relieve the pressure of the pipeline in the event of a surge or process deviation, which may result in a release.

It is important to understand that the items above are notices of *probable* violations. As a result of PHMSA's review and resolution process with Dakota Access, PHMSA withdrew several items that might have indicated systemic issues (items 2, 4, 5, and 6). PHMSA issued a Consent Order, effective January 11, 2022, finding violations for items 1, 3, and 7; however, these violations have all been corrected. PHMSA's Consent Agreement (an attachment to the Consent Order) states "the allegations in the Notice are expressly applicable to certain locations along the DAPL pipeline as stated therein, and through this Agreement and are fully resolved." None of the locations in PHMSA's notice were associated with the Lake Oahe crossing and none of the violations affect the likelihood or consequences of a crude oil release at Lake Oahe.

When considering risk, it is important to avoid consideration of double jeopardy events—events where two or more rare occurrences happen simultaneously—because there is an infinite number of combinations of events that may result in a release. Dakota Access has stated that they will continuously improve their safety culture as a response to these infractions. Doing so will reduce the likelihood of an event.

The following section provides details on Energy Transfer's release records. The Oglala Sioux Tribe commented that the safety records of other DAPL minority owners should be included. However, Energy Transfer is the majority owner, and is responsible for the operations and safety procedures. Therefore, Energy Transfer's release records are most appropriate to the analysis.

3.1.3.1. Energy Transfer Release Record

In considering the release record of Energy Transfer, it is important to first identify all liquid pipeline entities that are associated with Energy Transfer (including those where Energy Transfer has a controlling interest). These subsidiaries include:

- Energy Transfer Company
- Southern Union Gas Services, LTD
- Mid-Valley Pipeline Co
- Sunoco Pipeline LP
- Sun City Mobile Home Estates
- West Texas Gulf Pipeline Co
- Wynnwood Refinery Company
- SunVit Pipeline, LLC
- Vitol Midstream, LLC / Sunoco Midland Gathering LLC
- Bayou Bridge Pipeline, LLC
- China Creek
- SemGroup LP / Rose Rock Midstream companies
- HFOTCO, LLC
- White Cliffs Pipeline, LLC
- DAPL-ETCO Operations Management, LLC

Table 3.1.3-1 summarizes the number of releases per year per pipeline entity. Analyzing the PHMSA data available (PHMSA, 2021a) for all pipelines under these entities, there are a total of 414 releases from 2010 to 2020, with 235 of those from Sunoco Pipeline LP. Of the 414 releases, 133 releases (32 percent) were from pipelines and valve stations, of which 20 releases (5 percent) were crude oil releases while under the ownership and controlling interest of Energy Transfer (Table 3.1.3-1). The rest were releases from pump stations or storage tanks, which have many more points of failure and, expectedly, a greater number of releases, the majority of which were fully contained and/or recovered. The largest release was an 8,600 bbl from Sunoco Pipeline LP, while the smallest release was a 0.02 bbl release from Sunoco Pipeline LP. The average release size was 125 bbls.

The 8,600 bbl release from Sunoco Pipeline LP was a corrosion failure that occurred while CPM methods were not fully functional, resulting in the release being undetected for some time because the pressure readings never dropped below tolerable levels. This occurred in 2016 while the pipeline was not associated with Energy Transfer (2,000 bbls were recovered from this release). The next largest release was a 4,509 bbl release caused by stress corrosion cracking of the Mid-Valley Pipeline Co pipeline in 2014 while it also was not under Energy Transfer ownership/control. However, virtually all the released crude was recovered. Alarms immediately detected the leak and the pipeline was immediately shut down. The release location was detected in 3 hours before being contained, cleaned, and repaired, in spite of heavy weather conditions.

Table 3.1.3-1: Number of Crude Oil Releases each Year for Energy Transfer Owned Entities at Valve Stations or on the Pipeline

PHMSA Operator ID	Entity	Number of Releases each Year						
		2014	2015	2016	2017	2018	2019	2020
32099	Energy Transfer Company	0	0	0	1	0	0	0
18526	Southern Union Gas Services, Ltd	0	N/A	N/A	N/A	N/A	N/A	N/A
12470	Mid-Valley Pipeline Co	N/A	N/A	N/A	0	0	0	0
18718	Sunoco Pipeline LP	N/A	N/A	N/A	6	6	0	4
18719	Sun City Mobile Home Estates	N/A	N/A	N/A	0	0	0	0
22442	West Texas Gulf Pipeline Co	N/A	N/A	N/A	0	2	0	1
32096	Wynnewood Refinery Company	N/A	N/A	N/A	0	0	0	0
39131	SunVit Pipeline LLC	N/A	N/A	N/A	0	0	0	0
39307	Vitol Midstream, LLC / Sunoco Midland Gathering LLC	N/A	N/A	N/A	0	0	0	0
39462	Bayou Bridge Pipeline, LLC	N/A	N/A	N/A	0	0	0	0
36596	China Creek	N/A	N/A	N/A	0	0	0	0
31476	SemGroup LP / Rose Rock	N/A	N/A	N/A	N/A	N/A	0	0
31863	HFOTCO LLC	N/A	N/A	N/A	N/A	N/A	0	0
32288	White Cliffs Pipeline, LLC	N/A	N/A	N/A	N/A	N/A	0	0
39205	DAPL-ETCO Operations Management, LLC	N/A	N/A	N/A	N/A	N/A	0	0

Source: PHMSA, 2021a

N/A = Not associated with Energy Transfer during the designated year

Sunoco Pipeline's release record is one of the worst pipeline release records to date. However, Energy Transfer did not begin acquisition of Sunoco until late 2012. From 2012 through 2017, Sunoco traded separately from Energy Transfer on the New York Stock Exchange and operated entirely independently from Energy Transfer (including its own Board of Directors, management, and operating procedures).

In 2017, Energy Transfer merged with Sunoco and began integrating Sunoco's pipeline network and commenced operational control over those assets. Energy Transfer had no operational control of the Sunoco pipeline network nor their safety procedures prior to 2017. A comment received from Oglala Sioux Tribe expressed that data prior to 2017 (as seen in Table 3.1.3-1) should be included in the analysis. Oglala Sioux Tribe commented that because Energy Transfer's primary liquids pipeline experience came from the Sunoco acquisition in 2017, Sunoco's release records prior to 2017 are relevant. While Sunoco's acquisition increased Energy Transfer's ownership and operation of crude oil pipelines, Energy Transfer maintains ownership and operational control of these assets, including safety operations. As such, Energy Transfer's pipeline operations after the Sunoco acquisition are most relevant and representative of future operations including risk reduction. Therefore, the releases attributable to Sunoco from 2010 through 2016 are not attributed to Energy Transfer's record (as with other pipelines) in this EIS. As shown by Table 3.1.3-1, the number of releases per year for Sunoco have demonstrated a downward trend since 2015. It is the duty of Energy Transfer to continuously improve their pipeline design and safety culture.

Some key points from the data are:

- A WCD has never occurred on Energy Transfer owned pipeline;
- Releases from the ETCO Pipeline account for approximately half of the releases from DAPL-ETCO Operations Management;

- Small releases, a point of concern for the Project if left undetected, account for the vast majority of releases from Energy Transfer owned pipelines, meter stations and pumps, breakout tanks, and other pieces of equipment; and
- Dakota Access has not had a single release from the mainline pipeline.

Using the data in Table 3.1.3-1, the release frequency of Energy Transfer -associated crude pipelines on the mainline or at valve sites (including all releases sizes) is 0.00033 releases per mile per year over the time period of 2014 through 2020. Using the data in Section 3.1.4, [Reliability and Safety] Release Frequency Analysis (industry average data), the total release frequency for all U.S. crude oil pipelines at valve sites or on the mainline is 0.0009 releases per mile per year over the time period of 2008 through 2020, which is almost three times more likely than Energy Transfer owned pipelines. Data for mainline releases and valve sites was used instead of data from all release locations because the Project Area is exclusively a mainline. Considering the limited data and substantial contribution to the number of releases by Sunoco Pipelines LP, and the fact that the Project crossing under Lake Oahe was installed via HDD, using Energy Transfer data for a baseline frequency analysis would result in using data that is considerably skewed by the record of one pipeline that is not representative of the Project's design and is likely to have greater uncertainty compared to industry-wide data (see Section 3.1.4, [Reliability and Safety] Release Frequency Analysis). The data indicate that Energy Transfer-owned pipelines have a total release frequency far less than the industry average; therefore, to be conservative, industry average data is used throughout this EIS.

3.1.4. Release Frequency Analysis

Several comments received have identified concerns with the use of generic pipeline release data rather than data specific to Dakota Access (or Energy Transfer). However, as is discussed above, the data specific to Dakota Access is limited in the number of pipelines, design of pipelines, total barrels of crude transported, and the total mileage of pipelines when compared to generic pipeline data. Further, incident data indicates that the generic pipeline data industry average is worse than Energy Transfer's incident record, and therefore using industry-wide pipeline incident data is more conservative. The Project pipeline is also designed with additional safeguards in place compared to typical pipelines, such as a thicker than required wall thickness underneath Lake Oahe, while other Dakota Access/Energy Transfer owned pipelines are not. Using only Dakota Access or Energy Transfer owned pipelines would result in limited data and is therefore less appropriate than using generic data provided by PHMSA. The Project is better constructed than the average pipeline in the following ways.

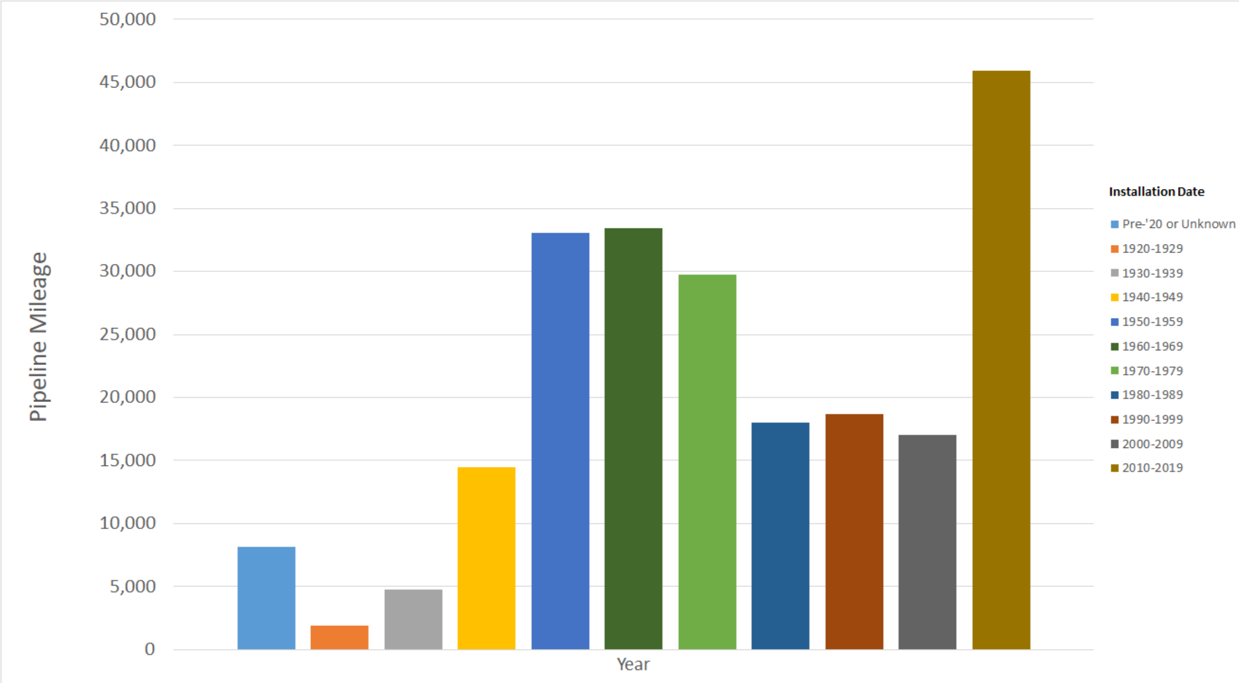
- The Project has a wall thickness greater than what is federally required.
- The Project is buried deeper than what is required by federal regulation.
- The Project utilized the best epoxy coating available at the time of construction and cathodic protection methods to prevent corrosion damages.
- The Project has additional separation distances and coverage to prevent third-party damages.

- The Project is installed via HDD methods.
  - According to a declaration from Michael Aubele in 2020 to the United States Court for the District of Columbia,[25] of the 3,368 reportable accidents that occurred on pipelines over the past 8.5 years, only 3 occurred at an HDD crossing (0.09 percent) and only one involved a crude oil pipeline (resulting in a 1.7 bbl release with a subsequent 0.9 bbl recovery).
  - According to a data response from Dakota Access, the pipeline under their operating control that is most closely designed and comparable to the Project is Energy Transfer's Bayou Bridge Crude Pipeline, which went into operation in 2019 and had 17 HDD crossings at depths greater than 50 feet and pipeline wall thickness greater than PHMSA requirements. There have been no crude oil releases along the Bayou Bridge Crude Pipeline mainline including any of the HDD crossings.
  - According to a data response from Dakota Access, Energy Transfer also recently acquired SemGroup and its 24-inch-diameter Norco Crude Pipeline, constructed in 2017. The HDD method was used to cross the Mississippi River at depths greater than 50 feet and pipeline wall thickness greater than PHMSA requirements. There have been no incidents or releases at this HDD crossing location.

The pipeline is therefore expected to have a lower release frequency than average. Using industry-wide data on pipeline releases from 2008 to 2020 is conservative because it is less likely to result in an average release frequency with a large uncertainty because large datasets are less skewed by any given outlier and have much less uncertainty. Therefore, while data from Dakota Access / Energy Transfer owned pipelines indicate their release history on the mainline and valve sites is better than industry average, this frequency likely has a higher uncertainty value and is less conservative than a frequency developed using industry-wide data. Therefore, industry-wide data will be used as the basis for the frequency portions of this EIS.

Based on publicly available data from PHMSA, a large portion of hazardous liquid pipeline mileage currently installed (through 2019) was not installed via HDD. This is because the first HDD installation was performed in 1971 and, until 1979, installations were limited to short length installations. A large portion of active pipelines were installed prior to 1979, as illustrated by Figure 3.1.4-1 (PHMSA, 2021a; Hart Energy, 2005), indicating that the HDD technology available today was not available at the time of construction.

[25] Declaration of Michael C. Aubele in Support of Dakota Access, LLC's Brief on the Question of Remedy, April 28, 2020, in *Standing Rock Sioux Tribe; Yankton Sioux Tribe; Robert Flying Hawk; Oglala Sioux Tribe, and Cheyenne River Sioux Tribe; Sara Jumping Eagle, et al. v. U.S. Army Corps of Engineers and Dakota Access, LLC*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-1796 and 17-cv-267).



Source: PHMSA, 2021a

Figure 3.1.4-1: Hazardous Liquid Pipeline Mileage by Decade of Installation for U.S. Pipelines

Using generic data available from PHMSA is considered to be conservative for this analysis because of the existing safeguards in place, the modern pipeline design of the Project, and because it likely has less uncertainty than values calculated using Energy Transfer data only. Use of data for the statistical analysis from a larger national dataset may provide more counts of relatively infrequent events that may have occurred rarely or never within Energy Transfer's statistics.

The frequencies presented in this section are presented in the units of "number of incidents per year per mile of operating pipeline," or more simply as "per year per mile." These frequencies are all less than one and are therefore presented in scientific notation where necessary. To better present that data in manner more universal and understood by the public, these frequencies are converted to return periods. For example, a frequency of 1E-04 per year per mile of operating pipeline (0.0001 events per year per mile of operating pipeline) has a return period of 1 event every 10,000 years for any given mile of operating pipeline, calculated by taking the inverse of the frequency. This can correlate to several events per year given there is a large total mileage of operating pipelines in the United States. For example, if you have 2,000 miles of operating pipeline, this becomes 2,000 events every 10,000 years, or an average of 1 event every 5 years. Also, it is important to know that if an event has a return period of 10,000 years, this does not mean that 2 events in 10,000 years is not possible. Rather it means that each year in that 10,000-year period has an equal 1-in-10,000 probability of experiencing an event. Other frequencies that are presented as "number of incidents per year" or more simply "per year" are frequencies specific to the Lake Oahe crossing, and the return period is calculated the same way.

Commenters raised concerns with how the release frequency analysis is conducted, specifically that the approach "emphasizes incident frequency and normalizes spills." To focus the risk assessment specifically at the Lake Oahe crossing, the EIS provides the likelihood of an incident at any given mile of pipeline (i.e., the 1.03-mile crossing) using PHMSA incident data. Assessing the likelihood of an incident occurring anywhere along the entire DAPL pipeline would significantly overestimate the risk associated with the Project. This approach is common in NEPA (e.g., FERC uses this approach for its natural gas pipeline NEPA analyses[26] and the Keystone XL Supplemental EIS used incident rates of number of incidents per year per 1,000 miles of pipeline in its analysis[27]). Likelihood and risk factors are in the EIS to address real-world conditions where models cannot accurately capture real conditions.

Using publicly available incident data available from PHMSA (2021a), Table 3.1.4-1 summarizes the cause and number of incidents for onshore crude oil pipelines from 2008 through 2020, for an average of 67,692 miles[28] of operating onshore oil pipelines per year.

Table 3.1.4-1: Onshore Crude Oil Pipeline Incident Data (Number of Incidents) for U.S. Pipelines

Cause (2008–2020)		Incident Detailed Size Category (bbls)					
		< 50 bbls	Small (< 100 bbls)	Medium (< 1,000 bbls)	Large (< 10,000 bbls)	Huge (> 10,000 bbls)	Total
1	Corrosion	241	15	32	10	0	298
2	Natural Forces	17	1	2	1	2	23
3	Excavation Damage	21	10	38	11	1	81
4	Other Outside Force Damage	18	3	7	3	0	31
5	Material and/or Weld Failures	55	5	12	12	2	86
6	Equipment Failure	157	1	6	2	0	166
7	Incorrect Operation	52	5	7	4	0	68
8	Other [a]	17	2	2	0	0	21
	Total:	**578**	**42**	**106**	**43**	**5**	**774**
	%	75%	5%	14%	6%	< 1%	100%

Source: PHMSA, 2021a

bbls = barrels

[a] "Other" includes releases that are under investigation, human (non-personnel) interactions, and other uncategorized causes.

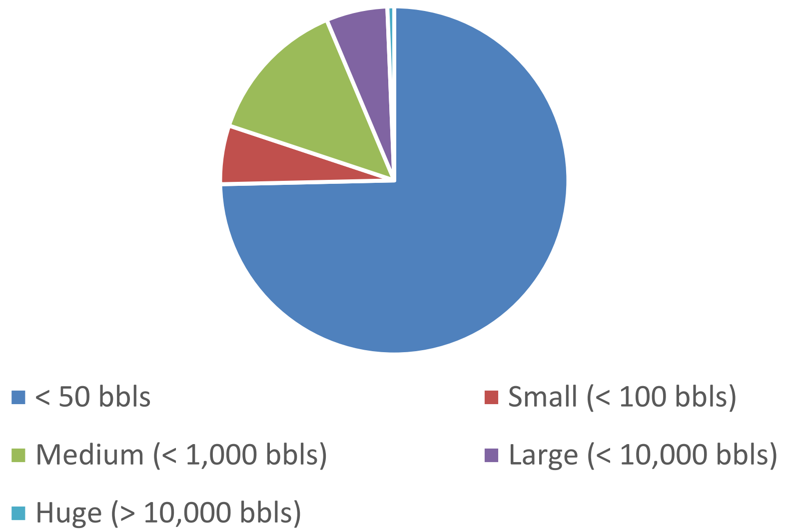
The data used in Table 3.1.4-1 include small to large diameter pipelines. Comments from the Oglala Sioux Tribe expressed that data should only include large diameter pipelines and associated equipment citing that a greater average release volume is generally associated with releases from larger diameter pipelines. Table 3.1.4-1 presents the number of incidents associated with each cause and release size category; it does not present average release volumes. If the data were to be filtered to only include large diameter pipelines (i.e., 26 inches or greater), this would include only 6.6 percent of the entire database of incidents. As a result, the counts of the number of incidents associated with U.S. pipeline construction would greatly decrease.

[26] See the *Draft Environmental Impact Statement for the Wahpeton Expansion Project* (FERC, 2022).

[27] See the *Final Supplemental Environmental Impact Statement for the Keystone XL Project* (U.S. Department of State, 2019).

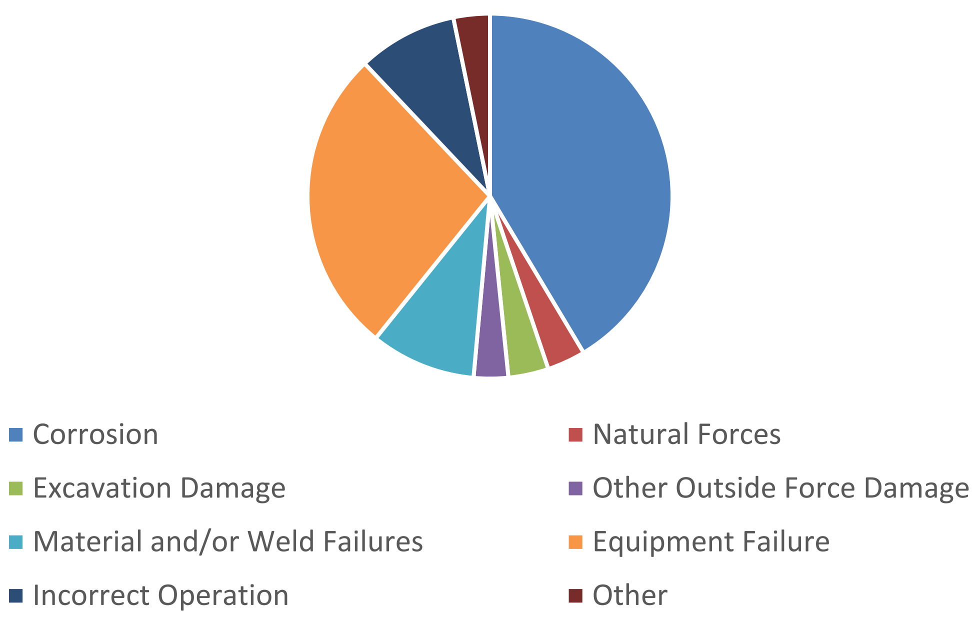
[28] PHMSA crude oil pipeline length data obtained online (PHMSA, 2023).

The top three contributors to leaks are corrosion, equipment failure, and material/weld failure. However, failures due to equipment failure are primarily pumps, fittings, tubing, and other equipment not located directly on the Project pipeline. Figures 3.1.4-2, 3.1.4-3, and 3.1.4-4 provide a visual of Table 3.1.4-1.



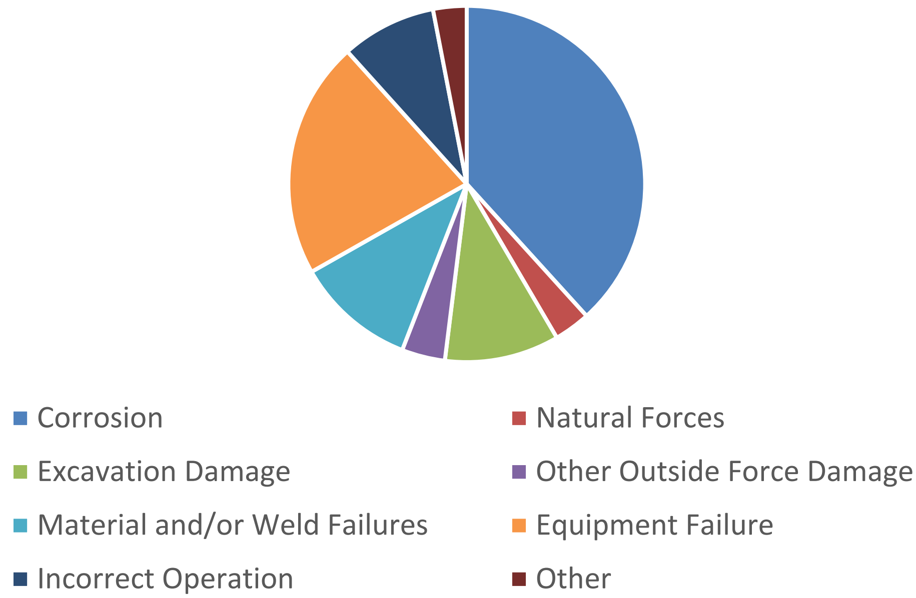
Source: PHMSA, 2021a

Figure 3.1.4-2: Incidents Detailed by Size Category for U.S. Pipelines



Source: PHMSA, 2021a

Figure 3.1.4-3: Cause Types Detailed for Releases of < 50 bbls for U.S. Pipelines



Source: PHMSA, 2021a

Figure 3.1.4-4: Cause Types Detailed for Total Releases for U.S. Pipelines

3.1.4.1. Corrosion

Corrosion is the largest contributor to the total release frequency of an onshore crude oil pipeline (38.5 percent of causes), with a rate of 0.000364 incidents per mile of pipeline per year for all onshore pipelines and for all size releases. The vast majority of the releases caused by corrosion were small leaks (less than 50 bbls), resulting in small consequence. In the case of the Project, there are several mitigation measures in place to prevent an accidental release from corrosion (both internal and external) and stress corrosion cracking:

- A thicker than required pipe wall;
- An epoxy coating;
- Active cathodic protection;
- Wall pipe design and in-line inspections; and
- The segment of the pipeline within the Project Area operates under low stress, as it is not exposed to external forces, operates well below the MOP of 1,440 pounds per square inch gauge (psig) (operates at 785 psig on average, 250 psig after optimization, as the new downstream pump stations will create suction that will reduce the pressure of the Lake Oahe section of pipe), and operates well below its maximum operating temperature of 100 degrees Fahrenheit (°F) (operates at 53.8 °F on average, which is not expected to change after optimization).

Some commenters stated that Bakken crude oil is considered corrosive. A report assembled for the DOT by the American Fuel & Petrochemical Manufacturers states that the corrosivity of Bakken crude oil using National Association of Corrosion Engineers (NACE) standard test method 172 scores as a B+ or B++ (Dangerous Goods Transport Consulting, Inc., 2014). Generally, a NACE value of B+ or better is required for transportation via pipeline. The report explains that a substance is considered corrosive if it corrodes steel or aluminum at a rate of 0.25 inch per year, and that Bakken crude oil does not corrode steel or aluminum at that rate; so Bakken crude oil is not a corrosive material.

Damages from corrosion are unlikely provided these safety measures are maintained. Further, it is worth noting that older pipelines often did not have cathodic protection, making the risks of corrosion damages higher than what is present for the DAPL Project and Lake Oahe crossing. Therefore, the frequency of incidents shown in the table above is likely greater than the actual frequency that would occur from the Project.

3.1.4.2. Natural Forces

Releases due to natural forces only account for about 3.0 percent of the total number of incidents, or approximately 0.000026 incidents per mile of pipeline per year. However, natural forces are one of the leading causes of releases in terms of release volume. While the frequency of such events is low, the consequence can be major. Dakota Access has several safeguards in place to prevent and/or mitigate releases from natural forces, which include:

- A thicker than required wall pipe;
- A burial depth of approximately 95 to 126 feet below the bottom of Lake Oahe;
- Sufficient resources and personnel in place to respond to any release six times the size of the largest conceivable release at Lake Oahe;
- Distance from sites affected by landslides; and
- Motor actuated automatic isolation valves on either end of the crossing.

Oglala Sioux Tribe expressed concerns of landslides and the geological reasoning behind the pipeline route. While routing is not within the scope of this EIS, as discussed in Section 3.2, Geology and Soils, landslides are a potential risk. The Lake Oahe crossing is located within Emmons County, which is categorized by the Federal Emergency Management Agency (FEMA) as located in Zone D, an area of undetermined but possible flood hazards (FEMA, 1987). Figure 3.1.4-5 (Maike et al., 2020) identifies areas affected by landslide, shaded and outlined, within the Cannon Ball Quadrangle. These areas are small and located far from the underwater crossing and valve stations. Therefore, damages from landslides or floods are very unlikely (1 in 36,647 years, as provided in Table 3.1.4-2). Even in the event of a landslide, the pipeline is more than 90 feet below the bed of Lake Oahe. Damages would be minimal. In addition, rates of hurricanes and earthquakes are maintained by the PHMSA's National Pipeline Mapping System and are categorized as low.

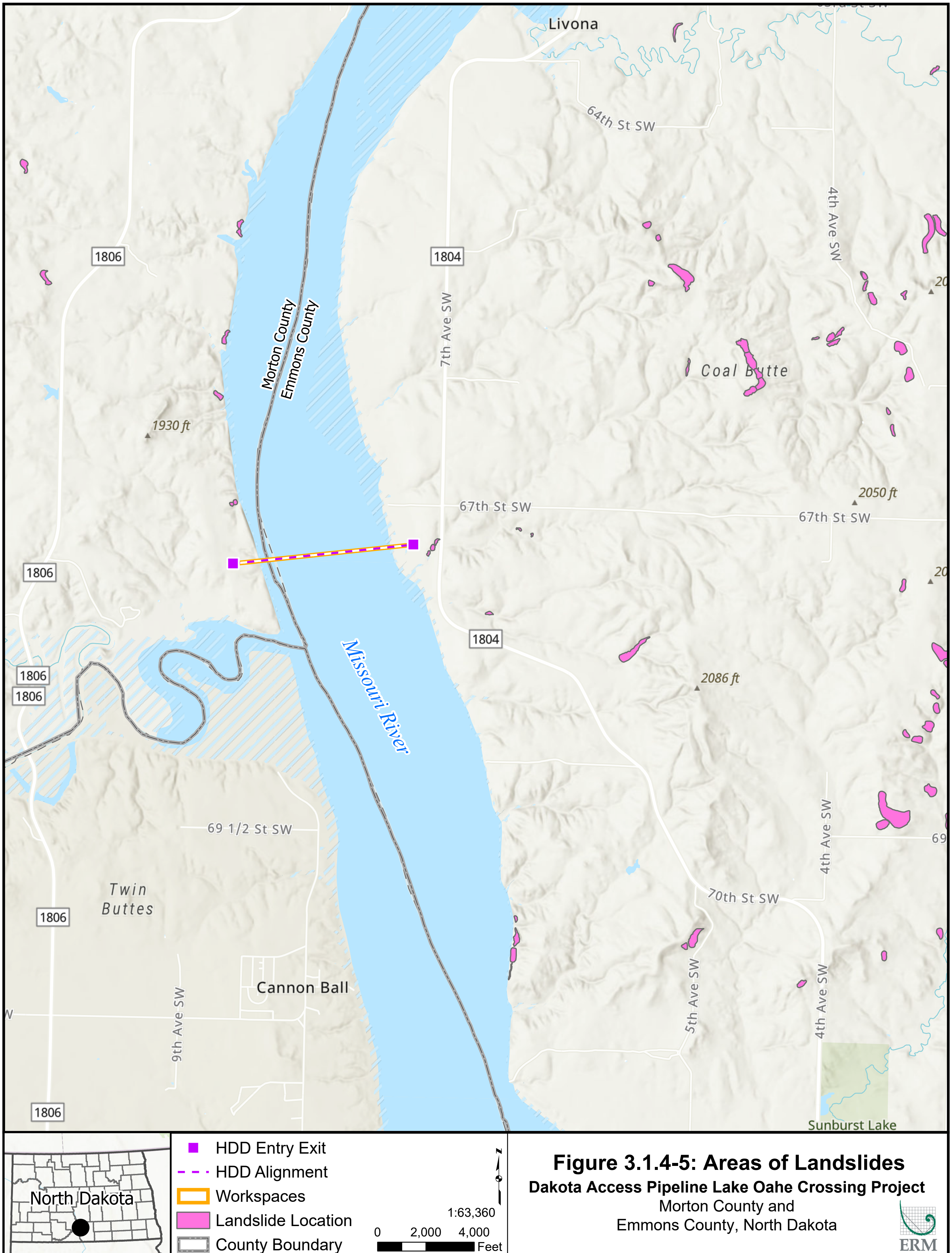


Figure 3.1.4-5: Areas of Landslides

Dakota Access Pipeline Lake Oahe Crossing Project

Morton County and
Emmons County, North Dakota

ERM

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According to the National Weather Service in association with the National Oceanic and Atmospheric Administration (National Weather Service, n.d.), Emmons County has averaged 37 tornados per year from 1950 to 2019, with the highest rated tornado being an F5. Considering the pipeline is more than 90 feet below the lake bed, the physical impacts on the pipeline from a tornado are expected to be low. Considering limited ability to impact underground steel by tornados, it is most likely that they account for only a small portion of natural force damages on pipelines reported by PHMSA. This is verified by the fact that of all the natural forces damages reported by PHMSA since 2010 (PHMSA, 2021a), only one pipeline or valve site was damaged indirectly by high winds, as high winds caused a cat walk to impact a chemical injection point. Therefore, the likelihood of the pipeline at the Lake Oahe crossing being impacted by a tornado is low.

Tribal comments also expressed concern about the pipeline's ability to withstand seasonal freeze thaw cycles. Pipelines exist throughout the United States and Canada in cold climate regions, including approximately 15,810 miles of hazardous liquid pipeline and 13,491 miles of natural gas transmission pipeline in Montana, North Dakota, South Dakota, and Minnesota as of 2021 (PHMSA, 2021a). The Project pipeline has been designed to withstand the local climate. Additionally, at the Lake Oahe crossing, the pipeline is buried over 90 feet below ground where surface season conditions do not affect the soil temperature.

3.1.4.3. Excavation and Other Outside Force Damage

Excavation and other outside force damages account for 10.5 percent of the total number of incidents, at a rate of 0.000095 incidents per mile of pipeline per year. Damages from outside forces (e.g., vehicle collision and third parties) are mitigated by systems currently in place, listed below. Also, in accordance with 49 CFR 192.614, Dakota Access is required to produce a written program to prevent damage from excavation activities. PHMSA inspections indicate that the federal requirements have been met for this program. Per 49 CFR 192.614, requirements of the damage prevention program include, but are not limited to:

- Identify the location of other pipelines;
- Notify the public and excavation personnel of the existence of the program and its purpose;
- Notify the public of excavation activities; and
- Frequent inspections.

In addition to these requirements, the following safeguards are in place to protect the pipeline from excavation damage and other outside damages:

- A thicker than required pipe wall;
- Marked pipeline locations before excavation begins;
- A burial depth of approximately 95 to 126 feet below the bottom of Late Oahe;
- A CPM and SCADA system that allows for the status of the pipeline to be reviewed in real time; and
- The permanent, accurate location of the pipeline as maintained by PHMSA.

Damages from excavation activities and outside forces are very unlikely (1 in 10,254 years for excavation activities, and 1 in 26,385 years for outside forces, as provided in Table 3.1.4-2) as long as these systems and the federal requirement for a damage prevention program are met and maintained.

3.1.4.4. Material and/or Weld Failures and Incorrect Operation

Material and weld failures account for a large portion of both the overall frequency (11.1 percent of incidents) and the frequency attributed to huge releases, accounting for approximately 0.00011 incident per mile of pipeline per year. Incorrect operation leading to overpressure contributes a comparable portion of the overall release frequency. However, releases from material and weld failures and incorrect operation can be safeguarded against. In the case of the Project, this includes:

- Only qualified personnel welders were utilized;
- All welds were inspected and x-rayed to ensure a strong, 100 percent girth weld;
- All materials were sourced from extensively vetted manufacturers;
- The entire pipeline was inspected with an in-line inspection tool before commissioning;
- The pipeline was hydrostatically tested at 125 percent of the maximum allowable operating pressure (MAOP) before commissioning;
- Pressure relief, monitoring, and control instrumentation was employed; and
- A design factor of almost twice the MAOP for the pipeline segment within the Project Area was applied.

Damages from material and/or weld failures or incorrect operation resulting in overpressure are unlikely.

3.1.4.5. Frequency Analysis

The probability of a release actually happening is also considered in terms of release frequency. Using onshore crude oil pipeline incident data from PHMSA, release frequencies for pipelines were calculated in terms of release per mile of pipe per year and categorized by release cause, utilizing data shown in Table 3.1.4-1. For each accident cause and size category, the number of incidents per year are counted and divided by the total miles of pipeline provided by PHMSA for the year. The frequency is then computed as the average number of incidents per mile per year across the 12 years of data (2008 through 2020). It is important to understand that the likelihoods presented in this EIS are specific to a likelihood of a release happening along the 1.03-mile-long crossing of Lake Oahe. Incident data from PHMSA clearly demonstrates that releases do happen every year along crude oil pipelines, and therefore, the potential for a release exists. However, an analysis must also factor how frequently releases occur in consideration of nearly a hundred thousand miles of pipeline in operation throughout the United States, and therefore consider the potential for a release to occur at any given segment of the pipeline.

The segment of pipeline that crosses Lake Oahe is approximately 1.03 miles across from shore to shore. The estimated likelihood of a release along the Lake Oahe crossing pipeline segment, categorized by release cause, is presented in Table 3.1.4-2, shown in terms of return periods (or the estimated number of years between events). The total release frequency of the 1.03-mile pipeline segment from all causes is 0.000974 releases per year, which is equivalent to a return period of 1,026 years, with catastrophic (greater than 10,000 bbls) releases being the most uncommon (having an occurrence frequency of 1 in 159,260 years).

Table 3.1.4-2: Lake Oahe Segment Estimated Return Period by Release Volume

Cause	Detailed Size Category (bbls)					
	< 50 bbls	**50 bbls > and < 100 bbls**	**100 bbls and < 1,000 bbls**	**1,000 bbls > and < 10,000 bbls**	**> 10,000 bbls**	**Total**
Corrosion	1 in 3,280 years	1 in 53,238 years	1 in 25,793 years	1 in 80,902 years	-	1 in 2,668 years
Natural forces	1 in 49,182 years	1 in 924,473 years	1 in 470,625 years	1 in 708,061 years	1 in 428,057 years	1 in 36,647 years
Excavation damage	1 in 39,797 years	1 in 77,470 years	1 in 21,588 years	1 in 81,805 years	1 in 1,066,186 years	1 in 10,254 years
Other outside force damage	1 in 44,763 years	1 in 269,392 years	1 in 132,030 years	1 in 233,925 years	-	1 in 26,385 years
Material and/or weld failures	1 in 13,820 years	1 in 164,032 years	1 in 72,675 years	1 in 63,914 years	1 in 332,783 years	1 in 9,020 years
Equipment failure	1 in 4,843 years	1 in 689,512 years	1 in 147,593 years	1 in 427,125 years	-	1 in 4,607 years
Incorrect operation	1 in 15,365 years	1 in 176,871 years	1 in 116,903 years	1 in 226,175 years	-	1 in 11,946 years
Other [a]	1 in 48,557 years	1 in 365,649 years	1 in 497,358 years	-	-	1 in 39,464 years
Overall	1 in 1,357 years	1 in 19,076 years	1 in 7,943 years	1 in 18,982 years	1 in 159,260 years	1 in 1,026 years
Overall for WCD	**1 in 67,827 years**	**1 in 953,818 years**	**1 in 397,166 years**	**1 in 949,116 years**	**1 in 7,963,024 years**	**1 in 51,312 years**

This table reflects the return period of an incident occurring on the Lake Oahe crossing length of pipeline, which is 1.03 miles long; the return period equals the reciprocal of the average incidents per year per mile multiplied by 1.03 miles. As previously stated, it is important to know that if an event has a return period of 10,000 years, this does not mean that 2 events in 10,000 years is not possible. Rather, it means that each year in that 10,000 year period has an equal probability of experiencing an event.
bbls = barrels; WCD = worst-case discharge
[a] "Other" includes releases that are under investigation, human (non-personnel) interactions, and other uncategorized causes.

The estimated release frequency of the 1.03-mile Lake Oahe crossing segment for releases greater than 1,000 bbls is 0.000059 releases per year, or a return period of 16,961 years.

The releases discussed above are historically low probability events.

The PHMSA data also includes all existing crude pipelines, which includes pipelines that are older than the Project or that do not exceed some minimum design standards as the Project pipeline does. For example, the segment of the pipeline that crosses Lake Oahe is thicker than the federal requirement, which would substantially reduce the frequency of releases from corrosion damage. Therefore, the frequencies above are likely *higher than* the actual release frequencies for this segment of the Project. This is in agreement with the British Standards Institution Code of Practice for Steel Pipelines (PD 8010-3:2009), a standard and good practice guidance recommended by United Kingdom Health and Safety Executive, which has established guidance for developing release frequency reduction factors based on material of construction, wall thickness, and depth of coverage, among others. Taking these into account, the total release frequency of the pipeline segment under Lake Oahe (0.000946 releases per mile per year, equivalent to 0.000974 releases per year in the 1.03-mile pipeline segment under Lake Oahe, or a return period of 1,026 years) can be reduced by a factor of 0.02 (0.2 for wall thickness, 0.2 for pipe size, and 0.5 for depth of cover). This results in the release frequency for the WCD of the pipeline segment underneath Lake Oahe for all causes being 0.000019 (1.89E-05) releases per year, or a return period of 51,312 years.

In addition, considering all the directions oil can travel before raising to the sediment-water interface, the probability of a release actually making it through the now-cemented bentonite encasement around the pipeline and approximately 95 to 126 feet of thick, low permeability rock is low. Therefore, the frequency of a release from the segment under the lake bed impacting Lake Oahe is likely on the order of 0.000001 (1E-06) releases per year, or a return period of 1,000,000 years, or more.

In the event of a release from the segment of the pipeline underneath Lake Oahe, the oil would have to travel through approximately 95 to 126 feet of low permeability sediment to get to the soil/water interface. This is unlikely, as any release would disperse through the sediment through the path of least resistance. This would include:

- Filling up any space between the pipeline and sediment;
- Dispersing laterally;
- Traveling downward; and
- Traveling upward toward the soil/water interface.

Traveling in all four directions stated above through over approximately 95 to 126 feet of low permeability sediment and reaching the water/soil interface would likely take a considerable amount of time as any release would result in depressurization of the pipeline segment, the path of least resistance is unlikely to be upward, and the sediment itself is low permeability, thick sediment. A pinhole-sized leak would likely take a substantial amount of time to reach Lake Oahe, while a large release (over 1,000 bbls) would likely be detected before any contamination of Lake Oahe occurred.

The risk assessment approach used by Dakota Access focused on prevention of releases for scenarios that had high consequences and low probabilities to reduce the overall risk.

The most credible large-release scenario that could occur would be a large release filling up the former HDD path and reaching the surface. However, a large release would be detected quickly (particularly when it reaches the surface) and containment would be a priority. The probability of a large release (over 1,000 bbls) from underneath Lake Oahe is remote.

3.1.5. Project Background: Past Impacts

To date, there have not been any crude oil releases or fires associated with Project construction.

There have been no crude oil releases along the DAPL Project mainline since it went into operation in 2017. There have been eight minor incidents associated with DAPL Project aboveground facilities, as described above in Section 3.1.3, [Reliability and Safety] Dakota Access and Energy Transfer Safety Record, none of which were in close proximity to the Project Area.

Commenters also identified a violation in which Rover Pipeline, LLC (an Energy Transfer subsidiary) added diesel fuel to the drilling mud used during an HDD of a river in Ohio. Commenters expressed concern about the potential for the same violation to have occurred on the Project and that this violation reflects on Energy Transfer’s corporate culture.

The Rover Pipeline is a natural gas transmission pipeline with siting authority under FERC and safety authority under PHMSA. Natural gas pipelines have different PHMSA safety regulations than oil pipelines because the risks are different (e.g., the operating risks for a natural gas pipeline are rupture, fire, explosion, etc. versus the operating risks of an oil pipeline are leaks and contamination based). There is no evidence to support that a similar violation occurred at the Lake Oahe crossing. The drilling contractor for the Rover Pipeline was different than for the Project (Rover Pipeline used a local Ohio-based contractor while Dakota Access used the nationwide contractor Michels Corporation for the Lake Oahe crossing). Finally, the violation for the Rover Pipeline was an environmental issue (not safety related or the result of a rupture or release during operation of the pipeline) occurring during construction of the pipeline and is not reflective of the potential for a crude oil release to occur during operation of the Project. For the above reasons, this violation is not included as part of the incident history or safety record considered for operating the Project.

3.1.6. Impacts and Mitigation

This section describes the potential safety risks the Project may have under Alternatives 1 through 5. This section also assesses the frequency of impacts from each alternative, where applicable. The potential impacts associated with a crude oil release or safety risks, and the resulting significance of those impacts on environmental resources, are discussed throughout Chapter 3, Affected Environment, Impacts, and Mitigation.

Many comments received during scoping requested a robust analysis of impacts from a potential crude oil release under varying scenarios, including a worst-case scenario. Commenters also stated that the impacts of a release would be catastrophic; and, therefore, the pipeline presents a significant risk supporting commenter statements that the pipeline should be shut down and an easement denied. As is discussed in Chapter 3, the risk associated with a particular hazard is evaluated based on a combination of the consequence (or impact) if the hazard is realized and the frequency (or likelihood) that the hazard may occur based on historical incident data, which may include mitigating factors. This EIS uses a Project Risk Matrix (presented on Figure 3-1) to identify the risk and significance of a crude oil release from the Project at Lake Oahe. Many scenarios representative of WCD at the Lake Oahe crossing under various water flow and weather conditions were modeled and are discussed further under Alternative 3.

3.1.6.1. Alternative 1

Under Alternative 1, the pipeline under Lake Oahe would be removed. There would be environmental and safety impacts under this alternative. The pipeline would need to be drained, purged, unburied, and taken apart into segments. During this construction activity associated with the pipeline removal, there is risk of residual hydrocarbon releases into the environment, which would result in the need for cleanup operations during and after removal. Should a release occur during removal activity, impacts from Alternative 1 are estimated to be short-term and minor to moderate as the construction activities would have noticeable but isolated, and reversible, impacts on the environment.

From a safety perspective, construction activities can result in no impacts on minor injuries to multiple fatalities, as heavy construction equipment and machinery are necessary for construction. According to the Occupational Safety and Health Administration (OSHA), construction activities that would be present during the construction of an oil and gas pipeline resulted, nationally, in up to eight fatalities in 2020, four fatalities in 2019, and one fatality in 2018 (OSHA, 2023). Considering the size of the U.S. construction industry, the total amount of time spent in pipeline construction activity is very large. The number of U.S. oil and gas pipeline construction employees was 227,900 in 2018, 238,217 in 2019, and 217,081 in 2020 (IBISWorld, 2023). Therefore, during the 3 years of 2018 through 2020, there were 683,198 years of pipeline construction worked. Based on these values, the resulting frequency of fatality from oil and gas pipeline construction activities is 13 fatalities in 683,198 years worked, or approximately 2E-05 fatalities per year or less (about 1 fatality for every 50,000 years of pipeline construction worked), categorized as very unlikely. However, this is still additional risk.

If Alternative 1 were implemented, the pipeline would no longer be in operation, eliminating any risk for a future crude oil release from the pipeline.

In conclusion, impacts associated with reliability and safety for Alternative 1 would not be significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

3.1.6.2. Alternative 2

Alternative 2 would likely result in little to no surface disturbance or environmental damage. Impacts from a release could occur during construction as the pipeline would need to be drained prior to cutting and capping. During this construction activity, there is risk of residual hydrocarbon releases into the environment. However, any such release would occur within the workspace for the construction activity (onshore within the former HDD sites), would be easily detectible, and would be contained and remediated promptly. Should a release occur during construction, impacts from Alternative 2 are estimated to be negligible to minor, as the construction activities would have noticeable but isolated, and reversible, impacts on the environment.

As with Alternative 1, if Alternative 2 were implemented, the pipeline would no longer be in operation. This would eliminate any risk for a future crude oil release from the pipeline.

In conclusion, construction and operation impacts associated with reliability and safety for Alternative 2 would not be significant.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

3.1.6.3. *Alternative 3*

Under Alternative 3, the pipeline under Lake Oahe would continue to operate with the same conditions set forth in the previous easement issued on February 8, 2017. This easement would allow for the operation, repair, replacement, and termination of the existing pipeline. The conditions are listed in Appendix D.

Under Alternative 3, there are no construction activities necessary. Therefore, no crude oil releases from construction are expected.

As is discussed above, operation of the pipeline includes a level of risk for a crude oil release, which is discussed further below.

Emergency Response Planning

Dakota Access is required to have a response plan for onshore oil pipelines in compliance with 49 CFR 194.107. The response plan must include, at a minimum:

- A summary as required in 49 CFR 194.113
- Immediate notification procedures
- Release detection and mitigation procedures
- The name, address, and telephone number of the OSRO, if appropriate
- Response activities and resources
- Names and telephone numbers of federal, state, and local agencies which the operator expects to have pollution control responsibilities or support
- Training procedures
- Equipment testing
- Drill program
- Plan review and update procedures

It is PHMSA's responsibility to review Dakota Access' FRP (Appendix F) to ensure that requirements have been met based on the full project volumes including the Optimization Project volumes. This review considers unique conditions such as low water flow conditions and ice cover conditions in which deploying typical watercraft at existing boat ramps would be impractical. Dakota Access intends to update the GRP to clarify that improved boats ramps are not essential to the recovery effort.

The Oil Pollution Act (OPA), the Clean Water Act (CWA), and the Emergency Planning Community Right to Know Act (EPCRA) outline the roles and responsibilities of various parties during an emergency response effort.

In 1990, the OPA amended the CWA to require some oil storage facilities to prepare FRPs. As such, Lake Oahe and the surrounding areas are subject to the *Federal Region 8 Regional Contingency Plan* (EPA, 2020) (Regional Contingency Plan). The Regional Contingency Plan provides a mechanism for coordinating responses to releases of oil or hazardous materials within the states of Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, and within the tribal lands of the 27 federally recognized Native American Tribes in Region 8. Under this Regional Contingency Plan, the Federal On-Scene Coordinator (OSC) (a representative from the EPA) is responsible for directing and monitoring responses to crude oil releases and hazardous substance releases reported to the federal government, including releases occurring on tribal lands. The OSC coordinates all response efforts and provides support and information to local, state, and regional response communities. The Responsible Party (RP), Dakota Access, would have primary responsibility for cleanup of a release to be conducted in accordance with the RP's applicable response plan and overseen by the OSC. The OPA and CWA provisions provide that Tribes are invited to participate in local and regional response planning efforts led by the OSC. The EPA OSC and a designated co-chair (also EPA) coordinate with the state and tribal representatives to develop an incident-specific Regional Response Team. When activated, members of an incident-specific Regional Response Team may:

- Provide resources and special or technical expertise;
- Provide advice and recommend courses of action for consideration by the Federal OSC;
- Advise the Federal OSC on the duration and extent of federal response, and recommend to the Federal OSC specific actions to respond to a release;
- Request other federal, state, or local government or private agencies to provide resources under their existing authorities to respond to a release or to monitor response operations;
- Recommend a change of Federal OSC to the standing Regional Response Team co-chairs, if circumstances warrant (e.g., substantial movement of the pollution into the predesignated area of another Federal OSC lead agency);
- Ensure continual communication with the National Response Center as significant developments occur; and
- Monitor and evaluate reports from the Federal OSC.

Under the OPA, Tribes may also act as a natural resource trustee, allowing them to bring claims for natural resource damages incurred by a crude oil release on tribal land, and assist with plans for the restoration and rehabilitation of natural resources under their trusteeship.

The EPCRA is designed to help local communities protect public health, safety, and the environment from chemical hazards. Under the EPCRA, notification to the State Emergency Response Coordinator and Local Emergency Response Coordinator is required if there is a release of a reportable quantity of an extremely hazardous substance. The EPCRA designates Indian Tribes as the implementing authority of the EPCRA on all lands within "Indian Country." Accordingly, the chief executive officer of the Tribe is responsible for the functions of the State Governor, including the appointment of a Tribal Emergency Response Commission (TERC). The TERC is then responsible for carrying out the duties of the State Emergency Response Commission (SERC) on tribal lands (e.g., trust lands, Indian Country) under direction of the OSC. Responsibilities include developing a community emergency response plan in the event of a release. The OSC would ensure that their actions occur within a government-to-government relationship with federally recognized tribal governments. The SRST TERC's Tribal Emergency Response Plan outlines the roles and responsibilities of the Tribe in an emergency response scenario.

Within the boundaries of the SRST tribal lands, the TERC is the implementing authority. As such, the TERC is led by the OSC and oversees the SRST Pipeline Oil Spill Emergency Response Team. The SRST's emergency response role may vary under different scenarios and conditions. The SRST Chairwoman or Chairman has the authority for decision-making as to the Tribe's role and scope of response activities, within the Tribe’s roles and responsibilities identified by the OPA and EPCRA, and with input from the TERC Chair and Emergency Management Office Director.

While the SRST supports cooperative planning activities with the EPA, SERC, and other response organizations to prepare for crude oil release response emergencies, the SRST requires approval from the Tribe prior to any entry or response activities by non-tribal organizations. Dakota Access would work in coordination with the SRST and other Tribes prior to conducting emergency response related activities on tribal land.

Tribal comments indicated that they believe there has been inadequate communication with the SRST regarding emergency response planning. In addition to the efforts provided in the government-to-government consultation summary (Section 1.6.1.2, [Introduction and Background] Consultation Efforts to Date), the Tribes have been provided with Dakota Access’ emergency response plans, invited to meetings to discuss the emergency response plans on several occasions (including meetings in December 2017; January, February, and March 2018; and July and August 2020), and invited to participate in crude oil release response exercises (with other agencies and stakeholders). The Tribes have either declined to attend these meetings, or attended and declined to engage in meaningful collaboration. The Tribes have also declined to participate in response exercises. The USACE encourages the SRST and Dakota Access to continue coordination on emergency response planning efforts.

Release detection may occur by visual detection by field inspection personnel or the public as well as by automated detection. Automated detection occurs when the pressure and flow monitors on the pipeline indicate there is a deviation of pressure flow larger than the preset tolerances. These systems are designed to alarm or automatically shut down depending on the size of the process deviation. The control center is equipped with a SCADA system, which allows for remote operation of key equipment.

In the event of a release, Dakota Access’s response would be immediate once detection is confirmed. The pumps would be shut down, the Lake Oahe crossing valves would be closed, and personnel would be dispatched to ensure the valves are closed and begin response. The Incident Commander would assess the size and hazards of the release. This assessment would determine the necessary actions. For water releases, booms may be deployed to contain the release; protect sensitive areas such as residential areas, tribal areas, environmentally sensitive areas, and historical areas; and to guide the release to a location where it can be more easily contained and recovered. To recover a water release, skimmers, vacuum trucks, or sorbent material would be used in the most effective manner for rapid and complete recovery of the release (Appendix F).

Comments requested information about the ability to respond to a release during low flow and ice cover conditions. Dakota Access has inventoried the availability to boat ramps in the surrounding Project Area. Based on historical lake levels and a low-level crude oil release scenario, Dakota Access is confident area boat ramps will be accessible for emergency equipment during low water conditions. In the event that oil is released on top of ice cover, berms (snow or earthen) or dikes filled with sorbent materials would be used to prevent further migration. Recovery methods would include manual recovery using brooms, shovels, and rakes to move the oil/snow mixture into piles for collection manually or via vacuum. If ice conditions permit, vacuum trucks or suction pumps could also be used. In the event that oil is released under the ice, “ice slotting” could be used. This method entails cutting the ice using chain saws, handsaws, ice augers, or a trencher, followed by recovery via skimming. Alternatively, the “diversionary plywood barrier method” would entail cutting a narrow slot through the ice and installing plywood (or an equivalent material) into the slot to create a barrier that directs the oil beneath the ice to a recovery area.

Comments also requested information about the cleanup of oil entrained in the water column. Oil is buoyant and would naturally form a layer on top of water where it can be collected. Surface oil can be temporarily entrained into the water column as wind-induced surface breaking waves break up the floating surface oil into oil droplets of varying size. Stronger winds and bigger waves result in smaller oil droplets being injected deeper into the water column. Calmer waters and conditions would result in larger oil droplets that are injected into shallower portions of the water column. Under calm conditions, the vast majority of entrained oil would rise through the water column and resurface in a matter of minutes or hours. A small portion of oil may adhere to suspended particulate matter within the water column, taking longer to surface or sinking out of the water column over hours or days. The FRP and GRP explain that slow-moving water, such as a lake or pond, offers the best conditions for removal of entrained oil because the oil will naturally separate and rise to the surface under calm or slow-moving conditions. With respect to small- or medium-sized streams, the containment and removal processes requires a calm stretch of water to allow the product to separate onto the surface of the water. If a calm stretch of water does not exist naturally, a deep slow-moving area would be created using a berm. Finally, for larger bodies of water, the FRP and GRP describe techniques to deflect oil toward areas where it can naturally separate from the water column, rise to the surface, and be collected through conventional techniques.

Tribal comments also requested information about the impact that low water levels could have on emergency response efforts. While water levels in the Missouri River have not, in recorded history, reached levels sufficiently low to prevent all improved boat ramps at Lake Oahe from being useful,[29] efforts are underway to improve boat ramp access at Lake Oahe in light of recent drought conditions. In the event that low water levels would impede access to boat launches, Dakota Access and its designated crude oil release removal organizations have access to airboats and mechanically launched conventional fast response vessels that do not require the use of improved boat ramps to meet the requirements of the crude oil release response plans. This equipment can be launched from identified low water access points or other areas where the nature of the lake bottom allows. The modeling of release scenarios also include modeling of releases during low water conditions.

Natural resources, environmentally sensitive areas, and historical resources would be given special consideration during release response. In some limited scenarios, these areas may be best protected by the use of in-situ burning, dispersants, and/or bioremediation. The use of these strategies would be determined from consultation with Natural Resource Damage Assessment Trustees and Historic Preservation Offices.

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[29] The Missouri River’s lowest water level on record occurred in August of 2006, with reservoir levels measured at 1,570.2 feet (Fridgen, 2010; National Weather Service, 2020). The water level would have to decrease below the vicinity of 1,570 feet to render all of the improved boat ramps completely unusable (USACE, n.d.), an event that has not occurred since Missouri River water levels were first recorded in 1967.

Modeled Release Scenarios

There would be no operational impacts associated with routine operation and maintenance of the buried pipeline under Alternative 3. Impacts would be limited to those associated with an inadvertent release of crude oil from the buried pipeline. In order to assess impacts from a crude oil release, two different release sites were evaluated using crude oil consequence modeling techniques (i.e., OILMAPL and the Spill Impact Model Application Package [SIMAP] trajectory, fate, and effects models). Modeling was performed by RPS Group, LLC, a company with extensive experience in health, safety, and risk, as well as other services. Releases were simulated at the center point of the Lake Oahe pipeline crossing and a location adjacent to the ND-380 valve, located to the west of Lake Oahe. The releases underneath Lake Oahe were conservatively modeled as occurring at the sediment/water interface (i.e., underwater on the surface of the lake bed), rather than at least 90 feet beneath the lake bed. The release at the ND-380 valve was simulated on land before entering waterways flowing into Lake Oahe. Two separate reports from the modeling efforts have been developed: the FRP Modeling Report, which models both unmitigated and emergency response mitigated release scenarios based on the WCD release volume identified in the FRP, and the PHMSA Modeling Report, which models only unmitigated release scenarios based on the WCD release volume identified using PHMSA's methodology. The simulated release volumes of the two reports are similar, with the FRP-calculated WCD being larger than the PHMSA-calculated value by 0.2 percent of total release volume for the Lake Oahe crossing and 16.6 percent for the ND-380 valve location. Both reports are included in Appendix G, Dakota Access Pipeline Optimization Modeling Reports.

The scenarios in the modeling reports are considered worst-case scenarios and are very conservative in nature. The reports include large volume releases being modeled as 10-day, completely unmitigated releases. To be clear, the shutdown time in the modeled scenarios was 12.9 minutes after release, and additional time is included for drainage of the ruptured pipeline. Other conditions such as low water flow conditions and ice cover were also modeled. The 10-day unmitigated release refers to no containment or cleanup measures being employed for 10 days following the release. This 10-day model is conservative, as, realistically, after 10 days, remediation measures with the focus of preventing further downstream movement of oil, such as oil booms, would already be in place (typically within hours of a release). For example, Dakota Access has committed personnel and resources sufficient to respond to and mitigate a potential release six times larger than the largest conceivable release, within 6 hours. The FRP Modeling Report also includes additional conservative scenarios in which FRP mitigation measures are deployed promptly to demonstrate the effectiveness of mitigation measures. Scenarios investigated a variety of weather conditions, including calm wind conditions that were conducive to oil containment and collection, windy conditions that reduced oil containment and collection, and wintertime ice-covered conditions, which included consideration of weather delays and reduced collection rates. Additional modeling in both reports was conducted to evaluate the impacts specifically on water intakes as described in Section 3.3.1.3, [Water Resources] Alternative 3.

Release volumes were calculated as WCD volumes for a full-bore release (FBR) with a throughput of 1.1 million bbls per day, taking into account the amount released before detection and shutdown (i.e., active pumping), during shutdown, and after shutdown (i.e., gravitational drain down). Shutting down the pipeline isolates the segment of ruptured pipeline between closed valves. After shutdown, there is still oil in the isolated section of the pipe that can drain due to gravity and has been captured in the WCD calculation. Therefore, the WCD calculation that is used for all modeled scenarios evaluated in this EIS includes the immediate released volume, the volume pumped through the orifice before pump shutdown occurs, and the total volume of oil drained by gravity after pump shutdown and before and after isolation by automated valves. This calculation is dependent on assumed detection, shutdown, isolation times, and the site-specific elevation profile.

Scoping comments requested justification for a 9-minute shutdown time used in past analyses or for this time to be updated. Complete shutdown plus isolation time in the modeling scenarios considered for this EIS was calculated to be a maximum of 12.9 minutes, taking into account 3 minutes for detection, 6 minutes to shut down pumps, and 3.9 minutes to shut down standard valves (or 3 minutes to shut down valves with faster actuators). Taking into account the FBR, the total volume pumped before shutdown, and the total volume drained by gravity before and after the valves successfully isolate the pipeline, in the PHMSA Modeling Report, these shutdown times correlate to a total release duration of 32.4 minutes for the Lake Oahe crossing and 10.8 minutes for the ND-380 valve site. In the FRP Modeling Report, a more conservative release was modeled where all oil (including volume drained by gravity) discharged in 12.9 minutes. In this scenario, the shorter duration release resulted in a larger volume per minute and thus more conservative transport predictions (i.e., larger predicted footprints of oil).

The WCD volumes and their underlying assumptions and methodology are consistent with the Mid-Missouri Sub-Area Contingency Plan (SACP; EPA, 2015). The Mid-Missouri SACP expressly permits use of operator-specific estimates. However, the Mid-Missouri SACP provides highly conservatively assumptions in the absence of operator-specific data: a release time of 0 minutes, a maximum detection and shutdown time of 15 minutes, a velocity of 6 feet per second, and a line section of 10 miles. The Mid-Missouri SACP and 40 CFR § 194.105, provides that "historical data or operator's best estimate" should be used to determine the maximum shutdown response time. The WCD release volume calculated in DAPL's FRP makes similarly conservative assumptions but uses DAPL's "operator specific data" and DAPL's best estimates to further inform the calculations. DAPL's WCD volumes account for DAPL's site-specific geography, whereas the Mid-Missouri SACP uses a more generalized topography that varies from flat, gently rolling hills to steep and dissected rolling plains. Accounting for the actual Lake Oahe topography, the drain-down section is approximately 4.39 miles and not the Mid-Missouri SACP's generic assumption of 10 miles. The site-specific shutdown time and drain-down section refinements result in a slightly lower WCD volume than that of the Mid-Missouri SACP.

Considering the SCADA and CPM systems in place, a FBR would likely be detected and response would be initiated in less than 3 minutes, as a FBR would immediately set off all alarms tied to flow and/or pressure. Pump shutdown and remote closure of valves would quickly follow in parallel rather than in sequence (i.e., the simulated 6 minutes to shut off the pumps and an additional 3 minutes to isolate on top of that is a conservative assumption used in the modeling). The Oglala Sioux Tribe questioned whether 3 minutes was an adequate detection time, particularly that it would not address "human factors." According to ATMOS International, a LDS vendor, LDSs are highly dependent on topography, diameter, configuration, instrumentation, and instrumentation location, while being most heavily dependent on the leak size relative to the normal throughout of the pipeline (ATMOS, 2019). Looking exclusively at the crude oil pipelines in the study performed by ATMOS International (ATMOS, 2019), LDSs have been recorded detecting a leak in less than 3 minutes when the size of the leak was 3 percent of the nominal flowrate of the pipeline. Leaks as small as 0.2 percent of the nominal flowrate were detected at various times, while leaks equivalent to 0.5 percent of the nominal flowrate were detected at a range of 1 to 3 hours. Large releases, 10 percent of the nominal flowrate and higher, were all detected in under 1 minute. While there are many factors that may affect the performance of a LDS (such as human error and technical malfunctions), a FBR will almost certainly be detected in less than 3 minutes. Therefore, a 12.9-minute time to isolation, assuming 3 minutes for detection, is justified for a FBR and accounts for human and other factors. However, while a FBR would likely be detected within 3 minutes, detection times for small releases have historically taken anywhere from minutes to weeks to detect, depending on the pipeline and instrumentation configuration. This issue can be mitigated by following API RP 1175 and API RP 1130, which recommend pipeline operators to test and evaluate their LDS and establish metrics for continuous improvement.

Worst-Case Discharge Scenarios

A stochastic modeling approach was employed to identify a suite of credible “worst-case” scenarios for the Lake Oahe pipeline crossing and the ND-380 valve (two locations) for water surface, water column, and shoreline / sediment effects (three separate worst-case endpoints). The stochastic approach is based on an understanding of the need to capture highly variable environmental conditions that are known to exist between seasons and over many years and will affect the movement and behavior of oil (e.g., current speed and direction, wind speed and direction, changes in lake level and water depth, ice cover). Each simulation used different start and end times and different durations in order to capture environmental variability, thus ensuring a range of trajectory, a range of fates, and a range of potential effects. Each report analyzed two stochastic scenarios, which consisted of 290 individual model runs each for a total of 580 model runs per report. Analysis of these individual model runs allowed for the selection of representative worst cases for effects, associated with the worst-case timing of a release, from the simulated WCD volume.

The PHMSA Modeling Report (Appendix G) was developed in accordance with PHMSA’s methodology for calculating the release volume and provided model results of completely unmitigated 10-day simulations with randomized start dates over a 10-year period. These simulations modeled many possible environmental conditions present over this period. From the 580 individual model simulations, 95^{th} percentile “worst-case” scenarios were identified for surface oil, water column contamination, and shoreline / sediment effects at both locations, for a total of six representative deterministic “worst-case” scenarios (Scenarios 1 through 6). For surface oil, the scenario with the 95^{th} percentile largest area with oil thickness floating on the water surface above the 0.01 micrometer (µm) threshold was determined. For the subsurface (i.e., water column contamination), the scenario with the 95^{th} percentile largest quantity of oil in the water column was determined. For the shorelines, the scenario with the 95^{th} percentile longest length of shorelines with an oil concentration above 0.09 gram per square foot (g/ft^2) was determined.

The FRP Modeling Report (Appendix G) uses slightly larger release volumes, assumes more conservative (higher) release rates, different release durations, and addresses specific scenarios requested by the Tribes and commenters (including ice cover, low flow conditions, high winds, etc.). Similar to the PHMSA Modeling Report, the FRP Modeling Report examines the range of outcomes from hypothetical WCDs left unmitigated for 10 days. From the 580 individual unmitigated model simulations, six scenarios were selected using the same start dates and times of Scenarios 1 through 6, for equivalent “worse-case” scenarios under the new conditions. Scenarios 1 through 6 examined three “representative 95^{th} percentile worst-case" conditions for surface oil, water column contamination, and shoreline / sediment effects at both release locations, separately. Scenarios 7 through 12 used the same start dates with slightly different volumes and, therefore, the scenarios ranged from the 90th to 97th percentile worst-case scenarios.

Additionally, the FRP Modeling Report models how applying emergency response mitigation activities would affect outcomes depending on environmental conditions at the time of a hypothetical release. Two sets of three "worst-case release volume" scenarios were run (three environmental conditions at the two locations), with mitigation measures (Scenarios 13 through 18). In order to analyze the range of a successful response and a slightly less successful response, including winter recovery, the three conditions were: calm wind, windy conditions, and ice-covered winter. Note that the crude oil release dates of these six scenarios were chosen for specific weather conditions and therefore do not match the dates chosen for the 95th percentile "worst cases" used for effects based upon environmental conditions for Scenarios 1 through 6 and likewise for 7 through 12. Therefore, the results of these scenarios with mitigations (Scenarios 13 through 18) cannot be directly compared to the results of the first 12 scenarios.

The 18 scenarios are further described below. Impacts on resources associated with the crude oil release scenarios are provided throughout Chapter 3, Affected Environment, Impacts, and Mitigation, and summarized in Table 3.1.6-1, below. Scenarios 1 to 3, 7 to 9, and 13 to 15 represent releases from the middle of the pipeline under Lake Oahe with all of the released oil immediately entering the water (ignoring any transport and losses through over 90 feet of low permeability sediment between the pipeline and the bottom of the lake, as well as the additional time it would take for such transport to occur after a leak was detected but before any oil reached the water). Scenarios 4 to 6, 10 to 12, and 16 to 18 were selected as "worst-case" releases deriving on the land at the ND-380 valve site where oil would travel overland into a small tributary before being transported downstream and reaching Lake Oahe via the Cannonball River.

Release scenarios that were modeled are described in detail in the PHMSA and FRP Modeling Reports (Appendix G).

Scenarios 1–6: Unmitigated 10-day releases using a release volume based on PHMSA methodology

- **Scenario 1:** A 32.4-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe resulting in the 95th percentile maximum surface area oil exposure. The WCD volume released was based on PHMSA methodology. This scenario is characterized by high river flow conditions in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **Scenario 2:** A 32.4-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe resulting in the 95th percentile maximum oil mass in the water column. The WCD volume released was based on PHMSA methodology. This scenario is characterized by 100 percent ice coverage and low river flow conditions, as low river flow limits dispersion and the potential for surface exposure and 100 percent ice cover limits evaporation. The release is unmitigated and the oil's transport and fate is simulated for 10 days.

- **<u>Scenario 3:</u>** A 32.4-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe resulting in the 95th percentile maximum shoreline length exposure. The WCD volume released was based on PHMSA methodology. This occurred during a high river flow condition in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 4:</u>** A 10.8-minute FBR originating on the land at the ND-380 valve site resulting in the 95th percentile maximum surface area oil exposure. The WCD volume released was based on PHMSA methodology. This scenario is characterized by high river flow conditions in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 5:</u>** A 10.8-minute FBR originating on the land at the ND-380 valve site resulting in the 95th percentile oil mass in the water column. The WCD volume released was based on PHMSA methodology. This scenario is characterized by high river flow conditions in the spring and winds that lead to the formation of surface breaking waves that result in the entrainment of oil into the water column. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 6:</u>** A 10.8-minute FBR originating on the land at the ND-380 valve site resulting in the 95th percentile maximum shoreline length exposure. The WCD volume released was based on PHMSA methodology. This occurred during a high river flow condition in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.

Scenarios 7–12: Unmitigated 10-day releases using the release volume identified in the FRP

- **<u>Scenario 7:</u>** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe using the same release date as Scenario 1 for the 95th percentile maximum surface area oil exposure. The WCD volume released was based on the FRP. This scenario is characterized by high river flow conditions in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 8:</u>** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe using the same release date as Scenario 2 for the 95th percentile maximum water column exposure to DHCs. The WCD volume released was based on the FRP. This scenario is characterized by 100 percent ice coverage and low river flow conditions, as low river flow limits dispersion and the potential for surface exposure and 100 percent ice cover limits evaporation. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 9:</u>** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe using the same release date as Scenario 3 for the 95th percentile maximum shoreline length exposure. The WCD volume released was based on the FRP methodology. This occurred during a high river flow condition in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **<u>Scenario 10:</u>** A 12.9-minute FBR originating on the land at the ND-380 valve site using the same release date as Scenario 4 for the 95th percentile maximum surface area oil exposure. The WCD volume released was based on the FRP methodology. This scenario is characterized by high river flow conditions in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.

- **Scenario 11:** A 12.9-minute FBR originating on the land at the ND-380 valve site using the same release date as Scenario 5 for the 95th percentile maximum oil mass in the water column. The WCD volume released was based on the FRP. This scenario is characterized by high river flow conditions in the spring and winds that lead to the formation of surface breaking waves that result in the entrainment of oil into the water column. The release is unmitigated and the oil's transport and fate is simulated for 10 days.
- **Scenario 12:** A 12.9-minute FBR originating on the land at the ND-380 valve site using the same release date as Scenario 6 for the 95th percentile maximum shoreline length exposure. The WCD volume released was based on the FRP methodology. This occurred during a high river flow condition in the spring. The release is unmitigated and the oil's transport and fate is simulated for 10 days.

Scenarios 13–18: Mitigated 10-day releases using the release volume identified in the FRP

- **Scenario 13:** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during calm wind conditions in May, with the potential for more effective collection and containment efficiencies. This scenario is characterized by high river flow conditions in the spring. The oil's transport and fate is simulated for 10 days.
- **Scenario 14:** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during a windy period in October, with the potential for reduced collection and containment efficiencies. This scenario is characterized by average river flow conditions in the summer/fall. The oil's transport and fate is simulated for 10 days.
- **Scenario 15:** A 12.9-minute FBR from the middle of the pipeline crossing, at the sediment-water interface underneath Lake Oahe. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during an ice-covered period in January. This occurred during a low river flow condition in the winter. The oil's transport and fate is simulated for 10 days.
- **Scenario 16:** A 12.9-minute FBR originating on the land at the ND-380 valve site. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during calm wind conditions in May, with the potential for more effective collection and containment efficiencies. This scenario is characterized by high river flow conditions in the spring. The oil's transport and fate is simulated for 10 days.
- **Scenario 17:** A 12.9-minute FBR originating on the land at the ND-380 valve site. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during a windy period in October, with the potential for reduced collection and containment efficiencies. This scenario is characterized by average river flow conditions in the summer/fall. The oil's transport and fate is simulated for 10 days.
- **Scenario 18:** A 12.9-minute FBR originating on the land at the ND-380 valve site. The WCD volume released was based on the FRP methodology. Crude oil release mitigation was assumed during an ice-covered period in January. This occurred during a low river flow condition in the winter. The oil's transport and fate is simulated for 10 days.

Frequency

Based on historical incident data (PHMSA, 2021a) and as presented in Table 3.1.4-2, a FBR is rare, with a conservative frequency on the order of 0.00001 per year (or a 1-in-100,000-year event). Also, the likelihood of oil from a FBR underneath Lake Oahe coming into contact with the surface water is lower considering the release would be from the pipe approximately 95 to 126 feet below the lake bed, and within a cemented bentonite encasement. To estimate the frequency of this event, a conditional probability is applied to the release frequency. Considering the safeguards in place, directional probabilities, and thick, low permeability sediment, this conditional probability is likely on the order of 1 percent. However, setting this conditional probability to 10 percent would result in a conservative estimated frequency of less than 0.000001 per year (or a 1-in-a-1,000,000-year event) that oil would reach Lake Oahe (see Section 3.1.4, [Reliability and Safety] Release Frequency Analysis, for more details). Again, this is conservative considering the safeguards in place, the relatively new pipeline, directional probabilities, and over 90 feet of low permeability, thick sediment that separates the pipeline from the lake bottom. In addition, because the pipe has been in the ground for nearly 6 years, the bentonite layer will have become cemented in place, offering a further impermeable seal against oil migration. Furthermore, Scenarios 1 to 3 are conservatively based on a release at the sediment-water interface remaining unmitigated for 10 days. As a result, Scenarios 1 to 3 can be assigned a frequency ranking of remote. Likewise, this frequency applies to Scenarios 7 to 9 and Scenarios 13 to 15.

It should also be noted that a more realistic scenario of a FBR would be a FBR resulting in oil traversing up the HDD profile. This scenario is described in more detail in the following section.

Concerning Scenarios 4 to 6, a FBR at a valve site is also a rare event, but is more likely than a full-bore rupture of a pipeline within an HDD crossing below Lake Oahe. While an unmitigated release may have major impacts, historical incident data suggest that a full-bore rupture would likely be caused by external impact. In this case, the release would be detected and responded to quickly, resulting in lesser damage. Conservatively after taking into account existing safeguards and all release causes, the frequency of such a release is likely on the order of 0.00001 per year (1 event in 100,000 years), or very unlikely using Figure 3-1. This frequency also applies to Scenarios 10 to 12 and Scenarios 16 to 18.

Effects Metrics and Impact Thresholds

Beneficial lake use is a conservative threshold used to assess effects on lake uses, including shoreline resources, and shoreline flora and fauna. The following thresholds and associated impacts are considered in this analysis:

- At surface oil thickness greater than 0.01 μm, impacts could include commercial, recreational, and subsistence fishing; aquaculture; recreational boating, recreation, transportation; water supply intakes; and aesthetics.
- When shoreline oil occurs at average surface area concentrations greater than 0.09 g/ft^2, the following impacts may occur: impacts on recreational beach and shoreline use and tourism, wildlife viewing, nearshore recreational boating, tribal lands, and subsistence uses, public parks and protected areas, tourism, lake dependent businesses, and aesthetics, as this amount may trigger the need for shoreline cleanup and initiation of temporary shoreline/beach closures.

- DHC concentrations greater than 1 µg/L (or THCs greater than 100 µg/L) are used as a conservative screening threshold for potential effects on sensitive organisms.

Ecological thresholds are screening thresholds for potential ecological effects on flora and fauna. The following thresholds and associated impacts are considered in this analysis:

- At surface oil thickness greater than 10 µm, the following effects have been observed: sublethal effects on birds, aquatic mammals, and reptiles, as well as mortality in birds. Fresh oil at this thickness may appear as deep brown or having a metallic sheen.
- When shoreline oil occurs at average surface area concentrations greater than 9.29 g/ft^2. sublethal effects on invertebrates have been observed and lethal effects on shoreline birds are assumed.

Notably, model results presented as average oil mass per unit area or "thickness" is actually a region with patches of oil of varying thickness, which when distributed evenly in the area of interest, would be on average a certain thickness, the "generalized thickness" used in the modeling results. The following visual appearances may be associated with generalized surface oil thicknesses:

- At surface oil thicknesses of 0.01 µm, barely visible or silvery sheens may appear.
- At oil thicknesses of 0.1 µm, a rainbow sheen may occur.
- At surface oil thickness of 1 to 10 µm, a metallic sheen may appear.
- At surface oil thickness of 100 µm, surface oil may begin to transition to its dark (or true) color.
- At a surface oil thickness of 1,000 µm, the surface oil may appear as heavy black oil (true color oil).

Table 3.1.6-1 below summarizes the effects metrics and associated thresholds described above.

Table 3.1.6-1: Effects Metrics/Thresholds Used in Crude Oil Release Modeling Analyses

Metric	Surface Effect Threshold	In-water Effects Threshold	Shoreline Effects Threshold
Potential Impacts on Beneficial Lake Use	Oil thickness > 0.01 µm	DHCs > 1 µg/L Whole oil (dissolved plus liquid droplets) > 100 µg/L	Oil mass on shoreline > 0.09 g/ft^2 (potential impact on biota)
Potential Ecological Impact	Oil thickness > 10 µm	DHCs > 1 µg/L THC > 100 µg/L	Oil mass on shoreline > 9.29 g/ft^2 (potential impact on biota) Shoreline oil thickness > 100 µm (potential impacts on vegetation)

Source: PHMSA and FRP Modeling Reports (Appendix G)

µg/L = micrograms per liter; µm = micrometer; DHC = dissolved hydrocarbon; g/ft^2 = grams per square foot; THC = total hydrocarbon concentration

Potential effects are the result of both the concentration of oil as well as the duration of exposure for specific receptors including aquatic, avian, wildlife, and vegetation receptors. In other words, the greater the concentration of oil and the longer any specific receptor is exposed to it in the environment, the more likely it is to have an effect. Simply exceeding a threshold is not necessarily sufficient to cause an impact. Similarly, the more sensitive a species (animal or plant), the more likely some of that species in that particular area will be affected. Given a range of concentrations, durations of exposure, and sensitivity of the species resident that may be exposed to the oil, the net result is a range of potential mortalities to the species in a given area. For example, one area may be estimated to potentially cause a loss of 20 percent of the population resident (i.e., a 20 percent mortality), while an area four times the size may cause a loss of 5 percent of the resident population.

To quantify the potential adverse effects in a manner that is comparable between scenarios, the SIMAP model estimates the equivalent area where 100 percent of a particular species could be mortally affected. This metric is called the "Equivalent Areas of 100 Percent Acute Mortality" for a given biological receptor group (abbreviated "EA-100"). The modeled area is divided into grid cells. Within each grid cell, the percent mortality is computed based on the hydrocarbon concentrations and duration of exposure for a given scenario. The area of each grid cell is multiplied by the percent mortality computed. The summation of all the areas multiplied by the percent mortality results in the EA-100. Using the previous example, an area 1 mi^2 multiplied by 20 percent mortality has an EA-100 of 0.2 mi^2, while an area 4 mi^2 with 5 percent mortality has the same EA-100 of 0.2 mi^2.

Impacts

Tables 3.1.6-2 and 3.1.6-3 identify downstream ranges where the thresholds identified above may be exceeded based on the results of the 18 crude oil release modeling scenarios. Potential effects are the result of both the concentration of oil as well as the duration of exposure for specific receptors including aquatic, avian, wildlife, and vegetation receptors. As a result, the mortality effects described in Table 3.1.6-2, below, are dependent on the duration of exposure to spatially variable concentrations that change through time. Effects, including mortality, are not expected to be uniform across the distances cited in Table 3.1.6-2.

In instances where the above surface and shoreline thresholds are met, they would be met intermittently over the distance presented and would change over time. This is because oil that becomes entrained in the water column can resurface farther downstream resulting in patchy and discontinuous impacts. As a result, Table 3.1.6-2 describes the farthest distance along the crude oil release trajectory where patches of oil could impact beneficial lake use. The threshold would not necessarily be exceeded along the entire distance.

The EA-100 values are used to quantify the impact by accounting for magnitude (concentration), duration, and area of exposure into a single metric. Other metrics may tell only part of the factors that lead to the overall impact. For example, in the surface effects, values are provided for the farthest distance where the oil thickness exceeded a visibility threshold (0.01 µm). However, the miles listed only tell the farthest distance in which such an oil thickness was predicted. It does not say how long that thickness persisted across that distance, or how consistent or spotty the oil's coverage was in that region, nor if that concentration was life-threatening to any organism. The second metric, for thicknesses greater than 10 µm, provides the farthest distance in which the ecological impact threshold is exceeded. This distance is not necessarily indicative of the entire area being oiled at that thickness since the presence of the oil may be transient as the oil travels downstream, weathers away over time, and may not be uniformly at that thickness. However, thickness and distance values provide some context to the EA-100 area value by quantifying the total distance wherein this impact may be elevated where the oil is thicker. For example, if the farthest distance where oil thickness exceeded 0.01 µm, 10 µm, and 1,000 µm were all the same distance, the EA-100 area is more likely to have been evenly distributed across the area, than if the differences of the distances were greater. The modeling analysis quantifies these impacts with respect to species with an average sensitivity to oil to provide a more realistic accounting of the amount of mortality within the EA-100 area, given populations of organisms will be both more and less resistant to adverse effects.

In a similar fashion, the EA-100 is calculated for in-water effects to provide a unifying metric packaging multiple complex processes into a single value in terms of area with 100 percent mortality. As each simulation modeled the transport of oil, it divided the oil into various compound classes, and estimated how much of each class dissolved, at what concentrations in each modeled grid cell over space and time. Each compound has the ability to dissolve (solubility) and a different toxicity to aquatic organisms. The model therefore computes at each grid cell the change in DHCs over time and converts that into a percent mortality for organisms in that grid cell. These are conservative estimates because in reality mobile organisms such as juvenile and adult fish can travel to avoid a dissolved plume of hydrocarbons. The model computes the EA-100, adding the products of the grid cell area by the total percent mortality in each grid cell by the end of the simulation. Therefore, distance metrics, such as farthest distance where DHC in-water concentration greater than 1 μg/L or greater than 100 μg/L, provide insight into the region where contamination may have been present above the threshold, but it does not inform what degree of mortality might occur at these distances, or over what area. DHC toxicity is typically caused by narcosis, like an anesthetic, such that brief exposures of elevated concentrations can be fully recoverable as the organism is subsequently exposed to cleaner waters (i.e., "depurates" the toxic concentrations).

Unlike the water surface or subsurface, the shoreline effects are not provided in terms of an EA-100. Because the shorelines are generally long but narrow, the area potentially affected would be relatively thin compared to the areas at risk on the water surface or in the subsurface. Here, the length of shoreline above the threshold is of greater importance. As a parcel of shoreline may be uniformly covered with oil, or be mostly clean with a few spots at high concentrations, there can be a range of outcomes given the same shoreline concentration. However, a threshold value of greater than 9.29 g/ft^2 is commonly used as an indicator of an area of shoreline at high risk for an ecological impact (fouling birds and wildlife). While the farthest distances exceeding the 0.09 g/ft^2 (beneficial lake use) and 9.29 g/ft^2 are useful for indicating the total region at risk, the length of shoreline oiled at a thickness of greater than 100 μm (almost equivalent to 9.29 g/ft^2) provides the total length within that region that exceeds the threshold.

Table 3.1.6-2 summarizes the predicted hydrocarbon trajectory and effects summary for the simulated unmitigated scenarios. Modeled scenarios include both the worst-case PHMSA and worst-case FRP release volumes at both the in-water crossing at Lake Oahe and the ND-380 valve potential release sites.

Table 3.1.6-3 summarizes the range of potential effects associated with the six worst-case simulated scenarios with response mitigation considered. The scenarios include both in-water crossing and ND-380 valve releases of FRP release volumes.

The results of the mitigated scenarios are not directly comparable to the metrics for the unmitigated scenarios presented in Table 3.1.6-2. The crude oil release dates selected for Scenarios 1 through 12 are different than the ones specifically chosen for the environmental / weather conditions required for the mitigated scenarios. Also, the EA-100 values are not provided for the mitigated scenarios, as the purpose of this modeling exercise was to illustrate the amount of oil that would be recoverable, and the effectiveness of mitigation in terms of the percent of oil that would be removed at the end of the 10-day simulation with and without ice conditions.

Table 3.1.6-2: Range of At-Risk Extent (Gray) or Effects (White) for Simulated Scenarios Without Response Mitigation [a,b]

Extent or Effects Metric [c] (at any point in time within the simulation)		Notes [d]	Range of Extent [e] or Effects for Worst-Case, Unmitigated Scenarios	
			Ice-free Conditions	Ice-covered Conditions
Surface Extent	Farthest distance where oil thickness > 0.01 µm (potential impact on beneficial lake use)	A, E	30 to 50 miles	2 miles (subsurface whole oil under ice)
	Farthest distance where oil thickness > 10 µm (potential ecological impact)	A, E	1 to 50 miles	2 miles (subsurface whole oil under ice)
	Farthest distance where oil thickness > 1,000 µm (i.e., heavy black oil; higher potential for ecological impact – acute mortality)	A, E	1 to 5 miles	2 miles (subsurface whole oil under ice)
Surface Effects	EA-100 for potential acute effects on wildlife (> 10 µm)	A, B, C, E	< 0.04 mi^2	N/A (ice-covered conditions)
Surface Extent	Farthest distance where DHC in-water concentration > 1 µg/L (potential impact on ecological and beneficial lake use)	A	38 to 60 miles	15 to 25 miles
	Farthest distance where DHC in-water concentration > 100 µg/L (higher potential for acute mortality to water column biota)	A	19 to 45 miles	~15 miles
In-water Effects	EA-100 for aquatic biota assuming average sensitivity species (i.e., LC50 = 50 µg/L)	A, C, D	< 0.04 to 2.4 mi^2	0.4 to 2.4 mi^2
Shoreline Extent	Farthest distance where oil mass on shoreline could exceed 0.09 g/ft^2 (potential impact on beneficial lake use)	E	23 to 50 miles	N/A (ice-covered conditions due to ice edge)
	Farthest distance where oil mass on shoreline could exceed 9.29 g/ft^2 (potential ecological impact)	E	23 to 50 miles	N/A (ice-covered conditions due to ice edge)
Shoreline Effects	Length of shoreline oiled at a thickness of > 100 µm (potential ecological impact on vegetation)	A, E	0.8 to 46.3 miles	N/A (ice-covered conditions due to ice edge)

Source: PHMSA and FRP Modeling Reports (Appendix G)

µg/L = micrograms per liter; µm = micrometer (or micron, a unit of length, whereby 1 µm = 0.00003937 inch); g/ft^2 = grams per square foot; mi^2 = square mile; N/A = not applicable

[a] The USACE has fully reviewed and analyzed the crude oil release modeling and associated analysis in Appendix G in assessing the environmental impacts of each alternative in this EIS. This table is designed to provide the reader of this EIS with an accessible, if limited, demonstrative of that crude oil release modeling and associated analysis. The USACE provides this table as a demonstrative only, and not as an authoritative summary of the USACE's conclusions or analysis or the conclusions or analysis of the crude oil release modeling. This table does not and should not be construed or interpreted to restate, change, replace, or supersede the detailed crude oil release modeling reports and analysis attached to this EIS in Appendix G. To understand the full context and details of the data contained in this table, and to more fully understand the basis for the USACE's analysis in this EIS, please refer to the crude oil release modeling and associated analysis in Appendix G. Those detailed crude oil release model reports, which the USACE has fully analyzed and considered, speak for themselves and provide the detailed analysis that underlies this EIS.

[b] The spatial extents above specified thresholds (gray rows) are typically much larger than the corresponding areas (EA-100s; white rows) experiencing acute effects. This is because ecological effects are based on exposure calculations that are dependent on both the concentration and duration of exposure, which ultimately influences acute mortality

(i.e., death). Ecological effects in the real world are not determined simply by a threshold exceedance, nor were they in the modeling assessment. Therefore, while stochastic threshold exceedances are provided below to compare results from different deterministic scenarios, the exceedance of any specific threshold was not the “trigger” or “tipping point,” which transitioned a release from no effects to effects. Effects were calculated along a continuum based upon concentration and duration of exposure.

[c] The study area (model domain) used in this assessment extended approximately 75 miles (120 kilometers [km]) downstream of the pipeline crossing of Lake Oahe and 15 miles (24 km) upstream of the crossing. The total area of Lake Oahe considered in this assessment was 97.3 mi^2 (252 square kilometers [km^2]). The total length of shoreline considered within this model domain was 493 miles (793 km).

[d] Notes key:

- A) Mortality effects may not be expected nor uniform over the entire distance oiled above the specific threshold. Effects are dependent on the duration of exposure to spatially variable concentrations that change through time. At an oil thickness of 10 µm or DHC concentration of 1 µg/L, a longer duration of exposure is required to result in acute mortality, relative to higher thresholds. As the thickness or concentration of oil increases, a shorter duration of exposure is required to result in acute mortality.
- B) This exposure assessment was not a simple threshold exceedance (binary trigger to effects). The footprint of oil at any point in time was a small fraction of the cumulative maximum surface oiling footprints. Because they were cumulative “maximum” footprints, the thickness at any point in time would almost always be below the provided maximum thickness (or may not be present at all) over the 10-day simulation, further reducing exposure duration. As such, the likelihood that an organism would be present at the time of thickest oil exposure was very low. Because of this, the exposure threshold was rarely reached, and wildlife impacts were predicted to be quite small.
- C) Note that river area experiencing any mortality was not calculated or reported. These areas would be greater than the EA-100 values reported here and vary by scenario based on downstream transport within each scenario as well as trajectory and fate processes, which contribute to changes in both concentration and duration of exposure. Exposure assessments like the one conducted here are not representations of simple threshold exceedances (binary presence/absence or threshold triggers to effects). For example, as mentioned previously, mortality is caused by exposure which is dependent on concentration and duration. Mortality can (and did) occur at concentrations below the thresholds used here. Similarly, some fraction of organisms will survive at concentrations above these same thresholds.
- D) There is a wide range of sensitivities to exposure to oil including intra-species sensitivity ranges (i.e., different organisms of the same species having different sensitivities, including consideration of different life stages) and inter-species sensitivity ranges (i.e., different species having different sensitivities). The crude oil release modeling reports consider this wide range of potential effects by assuming that either all of the organisms present had an average sensitivity (that is protective of 50 percent of the species present), which is presented here, or that all organisms were conservatively assumed to be highly sensitive to oil (and would be protective of 97.5 percent of the species and all life stages), thereby maximizing the potential for effects. Sensitive species may have an elevated mortality risk beyond the range provided here for “average sensitivity species.”
- E) Surface and shoreline oil were extremely patchy and discontinuous (in some cases extremely so) based on entrained oil briefly resurfacing at distances downstream. As an example, shoreline oiling could occur at a single spot 10 miles downstream with little or no oiling up to that point.

[e] Distances to maximum thickness/concentrations are not shown because maximum values would typically occur at or near the release location and dissipate as downstream distance increased. They are also transient values frequently persisting for only short periods of time at any single location. Notably, effects are dependent on the duration of exposure to spatially variable concentrations that change through time, rather than maximum values or binary threshold exceedance triggers.

Table 3.1.6-3: Predicted Emergency Response Effectiveness and Range of Effects for Simulated Scenarios [a,b,c]

Response or Effects Metric		Notes [d]	Range of Response, Extent, or Effects	
			Calm, Ice-free Conditions	Ice-covered Conditions
Summary of mass balance (at end of 10-day simulation)	Percent of oil removed	A	22 to 30% of oil entering Lake Oahe	26 to 51% of oil entering Lake Oahe
	Percent of recoverable oil removed (i.e., oil not evaporated or degraded)	A	43 to 56% of recoverable oil	42 to 80% of recoverable oil
	Percent of oil evaporated or degraded	A	46 to 48% of oil entering Lake Oahe	36 to 39% of oil entering Lake Oahe
Amount of recoverable oil anticipated to be removed upon completion of response activities		A	> 99%	> 99%
Surface Effects	EA-100 for potential acute effects on wildlife (> 10 µm)	B, C, D, F	< 0.04 mi^2	N/A (ice-covered conditions)
In-water Effects	EA-100 for aquatic biota assuming average sensitivity species (i.e., LC50 = 50 µg/L)	B, D, E	< 0.04 to 0.1 mi^2	1.3 to 2.4 mi^2
Shoreline Effects	Length of shoreline oiled at a thickness of > 100 µm (potential ecological impact on vegetation)	B, F	5.2 to 11.1 miles	N/A (ice-covered conditions due to ice edge)

Source: PHMSA and FRP Modeling Reports (Appendix G)

µg/L = micrograms per liter; µm = micrometer (or micron, a unit of length, whereby 1 µm = 0.00003937 inch); mi^2 = square mile; N/A = not applicable

[a] The USACE has fully reviewed and analyzed the crude oil release modeling and associated analysis in Appendix G in assessing the environmental impacts of each alternative in this EIS. This table is designed to provide the reader of this EIS with an accessible, if limited, demonstrative of that crude oil release modeling and associated analysis. The USACE provides this table as a demonstrative only, and not as an authoritative summary of the USACE's conclusions or analysis or the conclusions or analysis of the crude oil release modeling. This table does not and should not be construed or interpreted to restate, change, replace, or supersede the detailed crude oil release modeling reports and analysis attached to this EIS in Appendix G. To understand the full context and details of the data contained in this table, and to more fully understand the basis for the USACE's analysis in this EIS, please refer to the crude oil release modeling and associated analysis in Appendix G. Those detailed crude oil release model reports, which the USACE has fully analyzed and considered, speak for themselves and provide the detailed analysis that underlies this EIS.

[b] The study area (model domain) used in this assessment extended approximately 75 miles (120 km) downstream of the pipeline crossing of Lake Oahe and 15 miles (24 km) upstream of the crossing. The total area of Lake Oahe considered in this assessment was 97.3 mi^2 (252 km^2). The total length of shoreline considered within this model domain was 493 miles (793 km).

[c] For the winter mitigated scenarios, emergency response tactics were modeled using response information customized to those conditions (i.e., additional set-up time, delays for winter conditions, and stopping oil collection during nighttime hours). The response effectiveness was reduced by 90 percent of their nameplate capacity, reflecting uncertainty around other winter-specific limitations that could be encountered, such as weather conditions causing temporary work stoppage; unsafe ice conditions; limitations on plywood J-slotting technique; slow work caused by bulky winter clothing; slow work caused by slip trip fall risks; and equipment issues or maintenance needs due to winter conditions. As noted previously, every crude oil release is different. Depending on real-world conditions (e.g., partial ice coverage, fissures or leads in the ice, etc.) at the time of release, the amount of oil trapped beneath ice could be different than was predicted in these simulations, which would affect the amount recovered as well as the resulting potential for effects.

[d] Notes key:

- A) Note that response efforts would not stop after 10 days (the timeframe simulated within each model run). Efforts would continue until cleanup efforts were completed, at which point in time the majority of recoverable oil would have been removed. An assessment would be conducted at that time to determine whether further removal efforts cause greater harm to the environment and relevant receptors than the small amount of oil remaining (i.e., removal efforts would be more detrimental than the effects of remaining trace amounts).

- B) Mortality effects may not be expected nor uniform over the entire distance oiled above the specific threshold. Effects are dependent on the duration of exposure to spatially variable concentrations that change through time. At an oil thickness of 10 µm or a DHC concentration of 1 µg/L, a longer duration of exposure is required to result in acute mortality, relative to higher thresholds. As the thickness or concentration of oil increase, a shorter duration of exposure is required to result in acute mortality.
- C) This exposure assessment was not a simple threshold exceedance (binary trigger to effects). The footprint of oil at any point in time was a small fraction of the cumulative maximum surface oiling footprints. Because they were cumulative “maximum” footprints, the thickness at any point in time would almost always be below the provided maximum thickness (or may not be present at all) over the 10-day simulation, further reducing exposure duration. As such, the likelihood that an organism would be present at the time of thickest oil exposure was very low. Because of this, the exposure threshold was rarely reached, and wildlife impacts were predicted to be quite small.
- D) Note that river area experiencing any mortality was not calculated or reported. These areas would be greater than the EA-100 values reported here and vary by scenario based on downstream transport within each scenario as well as trajectory and fate processes which contribute to changes in both concentration and duration of exposure. Exposure assessments like the one conducted here are not representations of simple threshold exceedances (binary presence/absence or threshold triggers to effects). For example, as mentioned previously, mortality is caused by exposure which is dependent on concentration and duration. Mortality can (and did) occur at concentrations below the thresholds used here. Similarly, some fraction of organisms will survive at concentrations above these same thresholds.
- E) There is a wide range of sensitivities to exposure to oil including intra-species sensitivity ranges (i.e., different organisms of the same species having different sensitivities, including consideration of different life stages) and inter-species sensitivity ranges (i.e., different species having different sensitivities). The crude oil release modeling reports consider this wide range of potential effects by assuming that either all of the organisms present had an average sensitivity (that is protective of 50 percent of the species present), which is presented here, or that all organisms were conservatively assumed to be highly sensitive to oil (and would be protective of 97.5 percent of the species and all life stages), thereby maximizing the potential for effects. Sensitive species may have an elevated mortality risk beyond the range provided here for “average sensitivity species.”
- F) Surface and shoreline oil were extremely patchy and discontinuous based on entrained oil briefly resurfacing at distances downstream. As an example, shoreline oiling could occur at a single spot 10 miles downstream with little or no oiling up to that point.

Unmodeled Release Scenarios

Release scenarios that were not modeled in the PHMSA and FRP Modeling Reports (Appendix G) but are assessed here include:

- A slow or rapid release of crude oil beneath Lake Oahe and traversing the HDD profile; and
- A slow release at the ND-380 valve site.

In the event of any release below Lake Oahe, a considerable volume of crude oil could disperse through the sediment. The light, sweet crude oil transported by the pipeline would disperse more easily than heavy crude oil. However, the Project pipeline is buried between approximately 95 and 126 feet below the bottom of Lake Oahe, and boring logs show that an aquitard of thick, relatively impermeable sediment (the Pierre Shale) exists above the pipeline. The aquitard, the distance the oil would need to travel from the pipe through soil to reach the lake bottom, and the low permeability sediments accumulated at the bottom of Lake Oahe would together restrict the flow of oil up into the lake. In addition, the pipeline is equipped with CPM and SCADA systems and a thicker pipe wall within the Lake Oahe segment. Regular inspections and surveillance are also performed for the onshore portions. Resources are also in place to ensure Dakota Access can respond to a release six times larger than the largest conceivable release. Therefore, the likelihood of impacts from an oil release from under Lake Oahe are low, as discussed in Section 3.1.4, [Reliability and Safety] Release Frequency Analysis.

However, there is also the possibility that a release from beneath Lake Oahe would follow the path of least resistance (i.e., outside of the pipeline along the HDD profile) and migrate to the HDD sites. This scenario has the potential for environmental impacts similar in scope to the impacts of a release at a valve site, discussed below, but at a lower frequency.

There also exists the potential for a release from the onshore portion of the pipeline, where the burial depth is less (approximately 4 feet below the soil surface), such as within the former HDD sites or from the nearby valve site. Such a release could be rapid and of large volume, resulting in oil flowing downslope via surface, subsurface, or in-water (via the Cannonball River) flow into Lake Oahe. A second similar scenario involves the same location of release but via slow seepage of oil.

A large (nearly a FBR) near-surface release from the pipeline, would eventually contaminate the river, reservoir, connected rivers, and fish in the area if left unattended. However, the pipeline is equipped with CPM and SCADA systems, both providing real-time monitoring of pipeline conditions and leak detection capabilities. The pipeline is also equipped with automated actuators to close the valves on either side of Lake Oahe in under 13 minutes. As a final mitigation measure, this segment of the pipeline has enough personnel and resources to fully contain and mitigate a release six times larger than the largest conceivable release. This type of release would be detected as soon as it reaches the surface onshore and mitigation measures would be deployed upon detection and therefore, the volume and extent of this release are anticipated to be less than the modeled WCD scenarios modeled above. This scenario is unlikely given the design of the pipeline, which greatly reduces the probability of a release, and the monitoring and response measures in place to detect and contain a release. This scenario has a frequency of 0.000001 (1E-06) per year (1 event in 1,000,000 years) or less and is therefore classified as remote.

A smaller release, such as a release that is 2 percent of the nominal flowrate of the pipeline, would disperse through the 4 feet of soil overlaying the pipe more slowly and contaminate the water of Lake Oahe at a slower rate, but would be harder to detect. However, considering the oil is likely to flow along the path of least resistance and migrate to the HDD sites where it would be detected before entering the waterbody, the detection systems in place, safeguards, and cleanup resources available, the release would likely be contained and cleaned soon after detection. Based on PHMSA incident data, this scenario has a frequency that approaches 1E-04 per year, or 1 event every 10,000 years. This frequency can be reduced by giving credit to pipeline safeguards, such as the 0.09 percent incident rate along liquid pipelines that were constructed via HDD discussed above and the additional safeguards maintained on the pipeline (see Section 3.1.2, [Reliability and Safety] Pipeline Design), resulting in this scenario having a frequency on the order of 0.00001 (1E-05) per year (1 event every 100,000 years). However, since Energy Transfer owned assets have had small leaks on the mainline, a conservative frequency of 0.0001 per year (1 event every 100,000 years), or unlikely, is used for this EIS.

Several commenters identified a new scenario describing a small, pinhole leak releasing 1 percent of the pipeline’s throughput (or 11,000 bbls per day) for a long duration, as CPM and SCADA systems may not detect such a small leak. This EIS focuses on a FBR over a pinhole leak because a FBR would impact more soil and water instantaneously than a small, undetected leak would in a large amount of time. A FBR would immediately fill the entire HDD profile and begin impacting Lake Oahe if it reached the surface and flowed toward the water, while a small, undetectable release may take weeks or longer to do that. Therefore, a FBR is the WCD as described by 49 CFR 195. However, while the immediate consequences of a release from a small leak are not as severe as a FBR, the long-term effects can be experienced and therefore are considered. While 1 percent of the pipeline’s throughput is a small release in comparison to the overall throughput of the DAPL Project, this is a large volume of oil, equivalent to 462,000 gallons per day (11,000 bbls per day). Unlike the unrealistic modeled release scenarios above, when considering more probabilistic releases, then the likely pathway of a release should also be considered. This large volume of oil is unlikely to all travel through the thick, low permeability sediment underneath Lake Oahe, and instead is likely to follow the path of least resistance: the HDD profile. This release will also be affected by gravity, promoting filling the HDD profile before dispersing to Lake Oahe. Eventually, the released oil would reach the land surface and detection would occur visually. However, the possibility of impacting the lake is not zero. If this small release is conservatively assumed to be undetected until it fills the entire HDD profile, the magnitude of release would be major. After filling the HDD profile, oil would reach a valve site and follow the downward slope into the lake. If repair and remediation attempts were to release crude into Lake Oahe, an immeasurable amount of soil contamination around the pipeline would occur. The impacts from this unlikely offshore release would be major. This scenario would have a risk ranking of moderate.

Commenters also mentioned a scenario where surge overpressures cause a leak. Overpressures are captured in the PHMSA data presented in Section 3.1.4. Also of note, surge overpressures only account for a portion of this release frequency being primarily captured in the “Incorrect Operation” category. However, to be conservative, the frequency of a surge overpressure resulting in a leak can be estimated by applying a factor of 0.42 (the portion of frequency from incorrect operation, equipment failure, and weld/material failure) to the overall frequency. This results in a frequency on the order of 1E-07 releases per year, or a return period of 10,000,000 years. While potentially major in consequence, this is of remote likelihood, resulting in minor risk.

Lastly, commenters also mentioned the possibility of the electrically actuated isolation valves at the Lake Oahe crossing failing to operate due to power loss during an accidental release of crude oil. Reducing the frequency of a crude oil release any further by also accounting for the probability of a simultaneous power outage results in a remote likelihood. This frequency can be reduced even further if a backup, redundant generator was to be installed at the Lake Oahe crossing per the Alternative 3 additional conditions, as two generators would have to fail simultaneously as a crude oil release occurred. Therefore, even in the event of a large release with major impacts, this scenario has negligible risk.

Safety of Alternative 3

From a safety perspective, PHMSA incident data identifies a total of 3 fatalities that have occurred directly related to crude oil pipeline operation in the United States from 2010 through 2020 (PHMSA, 2021a). Considering there are over 85,293 miles of crude oil pipe as of 2020 in the United States with an average of 70,306 miles of operating crude oil pipelines between this 11-year period, this results in a frequency of fatality of 3.88E-06 per mile of pipeline per year, or 1 fatality every 257,789 years at any given mile of oil pipeline (e.g., for the Lake Oahe crossing). These frequencies can likely be reduced further considering the notable safeguards in place on the Project pipeline. Any fatality is considered a major consequence. Dakota Access and Energy Transfer specifically have not experienced a fatality in the last 11 years, but industry has with similar assets, correlating to a likelihood of occurrence of very unlikely. This results in a risk ranking for reliability and safety of moderate, which is not considered significant.

Alternative 3 Summary

Overall, analysis of incident data, frequency and consequence analysis, and review of existing pipeline safeguards indicates that sufficient safeguards are in place to prevent, respond to, mitigate, and remediate releases of crude oil into the Project Area. The impacts and resulting significance of a release on the environmental resource areas are discussed throughout Chapter 3, Affected Environment, Impacts, and Mitigation.

Many commenters asked who would be financially responsible for any cleanup efforts should a crude oil release occur, and requested that Dakota Access be made responsible. In the event of a crude oil release, Dakota Access would be financially responsible for cleanup and remediation in accordance with the OPA of 1990.

3.1.6.4. Alternative 4

Under Alternative 4, USACE would grant the requested easement to cross federal property at Lake Oahe with additional conditions and modifications that intend to further reduce the likelihood, intensity, and duration of a release. Additional required conditions and conditions Dakota Access has committed to are presented in Chapter 2, Alternatives, and are focused on earlier detection of a release and improved response times to a release.

This alternative would not result in any further construction; therefore, no additional safety concerns are present for construction activities. Under Alternative 4, operational impacts would be similar to Alternative 3. Increased mitigation measures, more advanced leak detection and protection, and more stringent conditions presented in Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions, would further decrease the risk and impact of a crude oil release. For example, as discussed above, Alternative 4 includes an additional condition for backup power for remotely actuating the Lake Oahe Valves in the event of primary power failure and simultaneous leak. The impacts and resulting significance of a release on the environmental resource areas are discussed throughout Chapter 3.

3.1.6.5. Alternative 5

The North Bismarck Reroute would cross the Missouri River north of Bismarck and would result in the construction of 111 miles of additional pipeline. From a safety perspective, construction activities can result in no impacts on minor injuries to multiple fatalities, as heavy construction equipment and machinery are necessary for construction. According to OSHA, construction activities that would be present during the construction of an oil and gas pipeline, nationally, resulted in up to eight fatalities in 2020, four fatalities in 2019, and one fatality in 2018 (OSHA, 2023). Considering the size of the U.S. construction industry, the total amount of time spent in pipeline construction activity is very large. The number of U.S. oil and gas pipeline construction employees was 227,900 in 2018, 238,217 in 2019, and 217,081 in 2020 (IBISWorld, 2023). Therefore, during the 3 years of 2018 through 2020, there were 683,198 years of pipeline construction worked. Based on these values, the resulting frequency of fatality from oil and gas pipeline construction activities is 13 fatalities in 683,198 years worked, or approximately 2E-05 fatalities per year or less (about 1 fatality for every 50,000 years of pipeline construction worked), categorized as very unlikely. However, this is still additional risk.

The impacts associated with operating the pipeline on the North Bismarck Reroute to humans would be similar to those under Alternative 3. From a safety perspective, using the data discussed under Alternative 3 and the length of the North Bismarck Reroute (i.e., 111 miles), the frequency of human fatalities along the North Bismarck Reroute is 4.31E-04 per year, or 1 fatality every 2,322 years.

Other operational impacts from the North Bismarck Reroute could occur as a result of an accidental release of crude oil. The North Bismarck Reroute crosses more waterways, grasslands, agricultural areas, and HCAs when compared to the current route. Because the isolated volumes, shutdown ties, and process conditions would likely be similar for the North Bismarck Reroute when compared to the current route, the impact area from a large release of crude would be similar. Therefore, any pipeline oil release that occurs on land would likely be more severe under the North Bismarck Reroute than the current route, as the North Bismarck Reroute is closer to a larger amount of sensitive areas. Also, the North Bismarck Reroute crosses the Missouri River just 12 miles upstream of Bismarck and Mandan, meaning a release similar to the WCD scenarios modeled under Alternative 3—under specific conditions—would be able to reach these two urban areas, both of which would be classified as HCAs by PHMSA. While the likelihood of impacts from a FBR would be ranked remote to very unlikely with a frequency similar to Alternative 3, their magnitude could be major. However, the magnitude of impacts will vary for each resource as described in each resource section throughout Chapter 3.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via trucking and/or rail discussed below.

During the abandonment of about 100 miles of pipeline, there is risk of residual hydrocarbon release into the environment. However, any such release would occur within the workspace for the construction activity, would be quickly detected, contained, and remediated promptly. Should a release occur during construction, the magnitude of a release is estimated to be negligible to minor, as the construction activities would have noticeable but isolated and reversible impacts on the environment.

If Alternative 5 were implemented, the pipeline would no longer be in operation under Lake Oahe. This would eliminate some risk for a future crude oil release from the pipeline impacting Lake Oahe, but would introduce risks to other areas.

Abandonment, or even halt in oil flow within the Project pipeline, may also cause oil that would otherwise be transported through the pipeline to be transported via other modes of transportation that impose greater risks of release, public health and safety risks, and pollution impacts, such as rail and truck transport. Indeed, it is likely that at least a portion of the oil currently being transported via the pipeline would be transported via alternative methods, as railroads and truck may be the only available option while a reroute is permitting and constructed.

The best method to compare rail and pipeline would be to compare their worst-case outcomes in terms of environmental damage and risk to human lives. While pipelines release more crude by volume (Green and Jackson, 2015), rail and trucks are responsible for more emissions (Clay et al., 2017) and a greater number of releases than pipelines (Green and Jackson, 2015; Furchtgott-Roth and Green, 2013). Rail and trucks also have larger probabilities of fires and explosions when compared to pipelines, as they are surrounded by ignition sources. The obvious hazards of rails and trucks, and the frequency of releases, which directly results in a higher frequency of ignited releases, results in more human lives lost due to rail operations than by pipelines. In fact, crude oil pipelines have resulted in six fatalities since 2001 (PHMSA, 2021a), whereas a crude oil rail incident killed 47 people in 2013 during the Lac-Mégantic Rail Disaster. This is only a portion of the fatalities caused by rail, which is alarming considering their low crude oil volume and distance traveled, relative to pipelines. Based on this data, frequency of fatality for rail is several orders of magnitude higher than that of pipelines at the least. The frequency of fatality for the Project was determined to be on the order of 1E-07 per mile per year (1 fatality every 10,000,000 years per mile), using data from 2013 to 2020. With at least 8 times more fatalities due to rail over the same period and an average of 95,000 miles of rail per year (Muller, 2021), this results in a frequency of fatality for rail of 7.7E-06 per year per mile of rail, or one fatality every 129,870 years per mile of rail. This does not include any fatalities in addition to that event, even though there were 757 railcars (not all related to crude oil) fatalities in 2020 and 862 in 2019 (NSC, 2021). This frequency will also increase once the specific route used to transport the crude from the Project is used, approaching a likelihood of occurrence of rail fatality of 1E-04 per year, or one fatality every 10,000 years (or unlikely). Considering any fatality as a major consequence, this results in risk ranking of major, especially when combined with the other impacts from Alternative 5. While the environmental impact from pipelines exceeds that of rails on a per release basis, the threat to human lives from increased rail traffic is significant.

From an environmental standpoint, the frequency of release for rail is calculated to 4.8E-05 releases per year per mile of operating railroad, or one release every 20,833 years per mile of railroad, using data from the Department of Transportation and Muller (Muller, 2021; DOT, 2018). The straight distance from Dickenson, North Dakota, (a filling rail terminal) to Sauget, Illinois (the closest receiving terminal to the DAPL Project's terminus) is 855 miles. Therefore, any rail transportation of crude would have to travel at least 800 miles. This results in a rail release frequency of 3.8E-02 releases per year, or one release every 26 years. This correlates to a likelihood rating of likely on the Project Risk Matrix presented on Figure 3-1 of this EIS. A small release from a crude rail would likely be of minor magnitude and is likely easily remediated. However, rails are capable of derailing and are surrounded by ignition sources, such as sparks from metal-on-metal contact, sparks from metal-on-rock contact, the engine, and controls nearby. If ignited, even a small release can result in escalation to a fire or explosion of moderate to major magnitude. A fire or explosion may cause wildfires and directly impact local flora and fauna, in the form of direct fire, thermal radiation, explosion overpressure, and thick, black smoke. Considering the ignition probability, the likelihood of these events would be categorized as unlikely.

Regarding pipelines, the potential for a release via a small, undetectable leak from a pipeline exists. Whereas a rail/truck accident and release is detected immediately, a theoretical small pipeline release may not be. However, this scenario as it pertains to the Project has a low frequency of occurrence, as previously discussed in Section 3.1.4, [Reliability and Safety] Release Frequency Analysis, and Section 3.1.6.2, [Reliability and Safety] Alternative 2, considering directional probabilities, the need to fill the HDD profile, and the frequency of release. Meanwhile, the frequency of events from trucks and rails are several orders of magnitude higher, while simultaneously putting more human lives at direct risk and still having the potential for environmental impacts. As a result, rail and trucks, especially in the large numbers needed to replace the Project, present a great risk to the environment and human lives (Furchtgott-Roth, 2013). Even a temporary halt in oil flow through the pipeline would result in increased rail and trucks needed to maintain the supply of oil, thus resulting in increased risks. In conclusion, construction and operational impacts associated with reliability and safety for Alternative 5 would not be significant, but operations from truck and rail may be.

Because the Project has been constructed, Alternative 5 requires Dakota Access to abandon a portion of the existing pipeline that was constructed; therefore, implementation of Alternative 5 results in the abandonment of the Lake Oahe crossing (under Alternative 1 or Alternative 2). Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Including the extensive construction impacts associated with Alternative 1, and the fatality impacts associated with trucking or rail under Alternative 5, the combined construction and operational impacts on reliability and safety for Alternatives 5 and 1 or Alternatives 5 and 2 would be significant.

3.2. Geology and Soils

3.2.1. Geology

Section 3.2.1 describes the geologic setting associated with the Project. Where appropriate, mitigation measures are included that are intended to reduce the impact of the Project on the geologic setting.

3.2.1.1. Project Background: Affected Environment and Impacts

The Project Area is within the Great Plains Physiographic Province. The Great Plains spans 450,000 mi^2 of flat "high plains" bordered to the west by the Rocky Mountains. The eastern border with the Central Lowlands is less distinct; the separation is characterized by the rainfall divide and changes in vegetation and soils. The Great Plains slope downward to the east, with maximum heights in the foothills of the Rockies at 5,500 feet above mean sea level decreasing to about 2,000 feet above mean sea level. The bedrock is horizontal beds of sandstones, shales, limestones, conglomerates, and lignite. In the northern Great Plains, glacial till overlies the Mesozoic bedrock. This area is also populated by small mountain groups caused by igneous activity and uplift. Most notable of these is the Black Hills about 200 miles southwest of the Project Area, which is a region of forested slopes with deep valleys cut by streams rising strikingly from the surrounding semiarid plains (National Park Service, 2021).

The bedrock geology of the Project Area is characterized by Cretaceous sedimentary formations (Clayton, 1980 as cited in USACE, 2016). The Fox Hills Formation (sandstone and shale) overlies the Pierre Formation (shale), which has been exposed through erosion along the axis of Lake Oahe. The surficial geology is characterized by alluvium within the valley and dune deposits moving in an eastward direction. This was corroborated by geotechnical soil borings conducted across the Project HDD path that indicate the presence of sands and clays to depths ranging from at least 150 to 235 feet below ground surface (see Appendix D of USACE, 2016).

The Project's effect on surface geology was temporary and minor because the effects were limited to construction activities within the right-of-way. Blasting was not conducted during construction of the Project. Dakota Access, to the extent feasible, restored the areas affected by pipeline construction to pre-construction contours and reestablished similar vegetation. Pre-construction and as built surveys have been completed and provided to the USACE.

The impacts attributable to the HDD were temporary and minor. Vibrations produced during the HDD process were not of a magnitude that would cause any impacts on geologic features or other resources. Any vibrations associated with the drilling process were limited to the immediate vicinity of the drilling equipment on the surface and downhole. The vibrations produced from the downhole tooling were of a low magnitude and attenuated quickly such that vibrations were not felt at the surface. A vibration monitoring analysis conducted by GeoEngineers in 2009 found that peak particle velocities were less than 0.07 inch per second within approximately 50 feet of HDD operations. These velocities are well below that which would cause any structural impacts; moreover, the recorded vibrations were imperceptible to human senses (GeoEngineers, 2009 as cited in USACE, 2016). The impacts on geological resources were not significant.

3.2.1.2. Current Affected Environment

There have been no changes to the geologic affected environment since the 2016 EA.

3.2.1.3. Impacts and Mitigation

Alternative 1

As described in Chapter 2, Alternatives, Alternative 1 would require major earthwork and engineering to remove the constructed pipeline. To remove the pipeline, Dakota Access would need to divert lake flow and excavate about 77 acres of the lake bed in two phases, resulting in a total of about 12.3 million cubic yards of excavated material. Storage of the spoil would require about 1,400 acres of land disturbance in upland areas adjacent to the lake. In addition, the required excavation would undermine the integrity of Northern Border's twin pipeline crossing of Lake Oahe, which is approximately 100 feet north of and parallel to the Dakota Access pipeline, thus requiring them to be relocated also. Relocation of the Northern Border pipelines cannot be analyzed at this time as Northern Border has not identified an alternative route to consider and is not required to do so as part of this review. However, relocation of North Border's pipelines would require authorization through the Federal Energy Regulatory Commission.

Dakota Access states that construction to remove the pipeline would occur over 6 to 20 years or more. Excavation would mix and/or break up geologic strata, including naturally occurring high-strength (i.e., confining) layers, which influence local geohydrology. Dakota Access analyzed the conceptual pipeline removal and states that construction activity and disturbance of the lakebed would impact the quality of the river post reclamation and would be impossible to place back to pre-existing conditions. The USACE agrees. To complete the excavation and removal, a construction technique similar to open surface mining would be required, including the use of benching and haul road ramps. Saturated, unconsolidated materials are anticipated within the excavation area and would result in a high risk of slope failure. Therefore, mitigation measures such as segregating and replacing like materials (similar to topsoil segregation or "double-ditching") would not be feasible. Impacts on the geologic column (i.e., layers of unconsolidated materials and rock below the surface) would have a long-term, if not permanent, effect and are anticipated to be a major alteration of the order and characteristics (e.g., permeability) of the geologic materials below the lake.

There would be no operational impacts on geologic resources under this alternative because the pipeline would be shut down and removed from the Project Area.

In conclusion, as a result of the direct and indirect effects identified above, construction activities associated with Alternative 1 would result in significant impacts on geologic resources.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses as a proxy the North Bismarck Reroute, although this route may conflict with the analysis performed by the State as it approved the siting of the pipeline in its current location. The North Bismarck Reroute is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

If Alternative 2 is adopted, temporary, negligible direct impacts on surficial geology are anticipated. About 13 acres of land would be disturbed during construction in order to abandon the pipeline in place, including access to the HDD tie-in inside of the existing 50-foot-wide permanent easement. Temporary impacts would mainly be limited to excavation of previously disturbed areas to expose, cut, fill, and cap the pipe. Following the filling and capping of the pipe, the area materials would be returned to the excavated areas and the surface would be stabilized and revegetated.

There would be no operational impacts on geologic resources under this alternative because the pipeline would be abandoned in place and cease operations.

In conclusion, construction and operation impacts on geology associated with Alternative 2 are not expected to be significant.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternative 3

There would be no new construction impacts under Alternative 3 because construction of the Project was completed in 2017.

The Project's operational impacts on geologic resources under Alternative 3 would be negligible because the ground contours have been restored and stabilized to pre-construction conditions, as feasible. As identified in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, the likelihood of one of the modeled WCD crude oil releases (inclusive of Optimization Project capacity) is remote to very unlikely, and the likelihood of a smaller, unmodeled release is remote to unlikely. If a release occurred, Dakota Access would minimize impacts by complying with the conditions of the easement. While impacts related to unmitigated release scenarios are discussed, impacts intensities used to determine significance are based on the assumption that Dakota Access would promptly clean up and remediate impacted areas in the event of a crude oil release, as is required under applicable federal regulations. Based on the modeling, impacts on geologic resources from the release itself would be temporary and range from negligible to moderate. Impacts would be worse where an unmitigated release occurred, during ice-free conditions, at the ND-380 valve site or under the lake. Modeling estimated that a release under these conditions would result in up to 9.29 g/ft^2 of oil being dispersed intermittently along 0.8 to 46.3 miles of shoreline (see Section 3.1.6). Modeling conducted for scenarios where mitigation was implemented estimated that a release from under the lake during ice-free conditions would result in up to 9.29 g/ft^2 of oil being dispersed intermittently along 5.2 to 11.1 miles of shoreline (see Section 3.1.6). However, as described in Section 3.1.6.3, the modeling for the mitigated scenarios assumed different baseline conditions and is therefore not directly comparable to the unmitigated scenarios. Under ice-covered conditions, impacts on the shoreline from a WCD release under the lake would be negligible as the oil would be contained under the ice. In the event of a WCD release, impacts on geologic resources from remediation of a release would range from temporary, minor impacts (e.g., shallow excavation to replace contaminated soils) to long-term, major impacts similar to Alternative 1 (e.g., deep excavation to replace contaminated sediments and repair/replace the pipeline in Lake Oahe). As such, a WCD crude oil release would result in a negligible to moderate risk on geologic resources.

In conclusion, construction and operation impacts (including the risk of a crude oil release) on geology associated with Alternative 3 would not be significant.

Alternative 4

There would be no new construction impacts under Alternative 4 because construction of the Project was completed in 2017.

The Project's operational impacts on geologic resources under Alternative 4 would be negligible because the ground contours have been restored and stabilized to pre-construction conditions, as feasible. Dakota Access would comply with the conditions of the easement to minimize impacts resulting from a crude oil release (inclusive of Optimization Project capacity). The likelihood of a crude oil release is remote to unlikely (see Section 3.1.6). Additional conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release. Therefore, should a release occur, impacts on geologic resources would be similar to or less than those described under Alternative 3 and the additional conditions would aid in minimizing the extent and impacts of a release.

In conclusion, construction and operation impacts (including the risk of a crude oil release) on geology associated with Alternative 4 would not be significant.

Alternative 5

The North Bismarck Reroute would cross similar geologic materials and formations as the 100-mile-long existing route, but would result in about 111 miles of new short-term, minor geologic impacts. The effect on surface geology would be minor because impacts would be limited to construction activities and temporary disturbance of surficial geologic materials within the right-of-way. The USACE assumes that Dakota Access would implement the same or more protective BMPs as those used during construction of the DAPL Project to minimize the impact on surficial geology (including restoring topographic contours to pre-construction conditions in areas of temporary disturbance). In the areas where aboveground facilities, such as valve sites, would be constructed, grading and filling may be required; however, these activities would result in permanent, minor impacts on surface geology.

Should a crude oil release occur during operation of the North Bismarck Reroute, impacts on geologic resources would depend on the extent and remediation method. Impacts could range from temporary, minor impacts (e.g., shallow excavation to replace contaminated soils) to long-term, major impacts similar to Alternative 1 (e.g., deep excavation to replace contaminated materials and repair/replace any HDD segments).

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of the about 100 miles of the DAPL Project would be similar to the effects described in Alternative 2. Multiple locations along the route may require excavation to expose, cut, and cap the pipe. Following the capping of the pipe, the materials would be returned to the excavated areas and the surface would be stabilized and revegetated. The USACE assumes that these locations would be primarily within previously disturbed rights-of-way and result in temporary, negligible impacts.

This EIS assumes that DAPL Project shippers would utilize existing transportation infrastructure and would not build new roads or railways to transport oil via trucking and/or rail; therefore, indirect geologic impacts from trucking or rail would be negligible under normal operating conditions. However, if a crude oil release occurs, the excavation of contaminated materials would temporarily impact surficial geology in the area of the release; the magnitude of the impact would be dependent on the size of the release. As described in Section 3.1.6.5, [Reliability and Safety] Alternative 5, transportation of oil by truck or rail statistically results in more frequent, lower volume releases, which would cause short-term minor impacts due to remediation activities.

In conclusion, construction and operation impacts on geologic resources for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include abandonment by removal activities discussed under Alternative 1 or the abandonment in place activities discussed under Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on geologic resources for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on geologic resources for Alternatives 5 and 2 would not be significant.

3.2.2. Mineral Resources

Section 3.2.2 describes the active and potential mineral resources in the vicinity of the Project.

3.2.2.1. Project Background: Affected Environment and Impacts

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

Because Morton and Emmons counties are located outside the areal extent of the Bakken Formation, there is little to no development of oil and/or gas resources. This is reflected in the fact that no active oil and/or gas wells are located within 100 miles of the Project Area (North Dakota Division of Mineral Resources, 2021).

There are no active mining areas nor oil or gas wells and facilities in the vicinity of the Project Area. Therefore, no impacts on any mineral resources occurred as a result of the Project.

3.2.2.2. Current Affected Environment

There have been no changes to mineral resources since the 2016 EA.

3.2.2.3. Impacts and Mitigation

There are no active mining areas or oil or gas wells within 0.25 mile of the Project Area (Alternatives 1 through 4), or the Alternative 5, North Bismarck Reroute, corridor. Therefore, impacts on mineral resources are not anticipated from Alternatives 1 through 5.

3.2.3. Geologic Hazards

Section 3.2.3 describes the geologic hazards associated with the Project. Geologic hazards are natural, physical conditions that can result in damage to land and structures or injury to people. Potential geologic hazards in the Project Area include earthquakes, landslides, and ground subsidence. Where appropriate, mitigation measures are included that are intended to reduce the impact of geological hazards on the Project facilities.

3.2.3.1. Project Background: Affected Environment and Impacts

Earthquakes and Seismic Hazards

The Project Area traverses terrain that overall is geologically stable. The potential seismic hazard was assessed by evaluating the USGS 2014 Seismic Hazard Map. According to the Seismic Hazard Map, an earthquake that has a 2 percent chance of being exceeded in a 50-year period would result in peak ground accelerations of 2 to 4 percent gravity in the Project Area (USGS, 2014a as cited in USACE, 2016).

Ground movement from an earthquake of this magnitude may cause a light perceived shaking but is not expected to cause any structural damage. The low seismic hazard of the Project Area is further corroborated by the relatively low number of earthquakes that have historically occurred in North Dakota (North Dakota GIS Hub Data Portal, 2021).

Earthquakes and seismic hazards did not affect construction of the Project.

Several comments were received regarding the risk of hydraulic fracturing and induced seismicity. Hydraulic fracturing is the process of injecting water, sand, and/or chemicals into a production well to break up underground bedrock and release oil or gas reserves. This process is intended to create new fractures in the rock as well as increase the size, extent, and connectivity of existing fractures in order to extract trapped oil and gas. Expanded unconventional oil and gas development has led to increased seismicity in several areas of the country, including areas where it was previously uncommon. The primary cause of these earthquakes, which can reach magnitude 3.0 to 6.0, is large-scale wastewater injection from oil and gas production. Studies to date show that not all induced seismicity is due to high volume injection wells but varies by region. Hydraulic fracturing would not occur as part of the Project; however, these activities do occur in the western part of North Dakota within the Bakken and Three Forks Formations associated with production activity. In addition, as discussed above, seismic events in North Dakota, including around unconventional production and high volume injection wells of the Bakken Formation, are uncommon (U.S. Department of Energy, 2016). As is discussed in Section 1.3, [Introduction and Background] Authority and Scope of EIS, the oil and gas production in these areas is more than 130 miles from the Project and is beyond the scope of this EIS.

Landslides

The SRST identified that the 2016 EA failed to address the significance of a landslide risk to the Tribe, the Tribe's treaty rights, and water resources. During SRST's participation as a cooperating agency, SRST provided input on the Draft EIS submitting information regarding landslides in the Project Area via a report titled *Preliminary Report: Landslides in the Vicinity of the Dakota Access Pipeline Crossing of the Missouri River near the Standing Rock Indian Reservation* (Rahn and Davis, n.d.). References included in this report have been reviewed and incorporated below, where applicable.

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. Based on a review of the USGS Landslide Inventory Map, only two recorded landslides have occurred within North Dakota. Both landslides were identified in 2011 and were located over 130 miles northwest of the Project Area (USGS, 2021). However, a majority of the Project Area is within land designated as having a high incidence of and/or susceptibility to landslides and includes some slopes greater than 25 percent (Radbruch-Hall et al., 1982).

In addition, 24K Landslide Maps (Cannon Ball Quadrangle) published by the North Dakota Geological Survey—also referenced in the SRST report—show that recent/Pleistocene landslide deposits in the vicinity of the Project Area are limited to steep embankments of Lake Oahe, surrounding stream and tributary banks, or steep butte backslopes. The Project Area is not located within any of these areas with evidence of recent landslide deposits (North Dakota Geological Survey, 2021).

Installation of the pipeline using the HDD method reduced ground-disturbing activities in areas with steep slopes (greater than 25 percent). In particular, ground-disturbing activities were located more than 1,040 feet from the west bank of Lake Oahe. In addition, as shown in Appendix A, Directional Drill Plan of Procedure, the pipe was installed approximately 100 feet below the surface of the steep slopes on the west bank of the lake. At this depth, it is unlikely that a slope failure would have any impact on the pipe. Portions of the Project Area outside the HDD crossed some steep slopes and landslide prone areas. To stabilize slopes, Dakota Access installed temporary and permanent BMPs in accordance with the ECP, SWPPP, and National Pollutant Discharge Elimination System program. Landslides were not observed during construction and restoration of the Project.

Karst and Subsidence

Karst is a landscape type or terrain characterized by the presence of sinkholes, caverns, and a highly irregular, pinnacled bedrock surface. Karst terrain develops from the dissolution of soluble bedrock, such as limestone, dolomite, marble, or gypsum. In addition, pseudokarst may form in areas underlain by geologic materials susceptible to the formation of voids produced by lava flows, by erosion of fine-grained sediments by means of piping, and by melting of permafrost. Based on a review of mapping from the USGS, the nearest potential karst terrain is located 50 miles northwest of the Project Area (Weary and Doctor, 2014). In addition, 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 developed in this Project Area. An existing buried pipeline and overhead electric transmission line also cross in the Project Area, and no information was found indicating those utilities have been impacted by karst. Finally, karst exposure or feature development was not observed during construction and restoration of the Project.

Land subsidence may be caused by mining, underlying karst features, and extraction of fluids, such as oil or groundwater. No surface subsidence effects are expected to be incurred in the Project Area because no mines, oil/gas wells, water wells, or karst development have been identified in the Project Area. Land subsidence was not observed during construction and restoration of the Project.

3.2.3.2. Current Affected Environment

There have been no changes to geologic hazards since the 2016 EA.

3.2.3.3. Impacts and Mitigation

Alternative 1

Due to the limited potential for large, seismically induced ground movements, no impacts associated with seismic activity within the Project Area are anticipated during construction of Alternative 1. Similarly, due to the lack of karst features and mining/oil and gas operations in the vicinity of the Project Area, there are also no impacts associated with subsidence anticipated during construction of Alternative 1.

A majority of the Project Area is within land designated as having a high incidence of and/or susceptibility to landslides. As discussed above, about 1,400 acres of land would be used for spoil storage and extensive site stabilization and monitoring would be required to limit the loss of stockpiled material into sensitive resource areas. The 12.3 million cubic yards of excavated material that would be stored in these areas would consist of loose, saturated sediments with a high risk of slope failure. If construction is completed successfully without incident, the landslide risk is considered short-term and minor with prompt slope stabilization and revegetation. However, due to the extensive construction period, complex engineering design, and working with saturated lakebed sediments in land with a high landslide incidence and/or susceptibly, there is a potential for long-term, major impacts if failure of the cofferdams, bench slopes, or stockpiled material occurs. Each phase of construction would involve the removal of millions of cubic yards of soils and sediments that could be discharged into Lake Oahe, its tributaries, or other sensitive resources.

There would be no operational impacts associated with geologic hazards under this alternative because the pipeline would be shut down and removed from the Project Area.

In conclusion, impacts associated with geologic hazards for Alternative 1, specifically from landslides during construction activities, would be significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

If Alternative 2 is adopted, short-term, minor impacts associated with landslides are anticipated. Areas excavated to expose, cut, and cap the pipe would be less stable and prone to slope failure. Once the areas have been restored and vegetation is established, the chance of slope failure would be minor.

There would be no operational impacts associated with geologic hazards under this alternative because the pipeline would be abandoned in place and cease operations.

In conclusion, construction and operation impacts associated with geologic hazards for Alternative 2 would not be significant.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternative 3

There would be no new construction impacts under Alternative 3 because the Project was completed in 2017.

Maintained pipelines constructed using modern arc-welding techniques have performed well in seismically active areas of the United States, such as California (O'Rourke and Palmer, 1996). Only large, abrupt ground displacements have caused significant impacts on pipeline facilities. Further, PHMSA safety regulations require operators to perform an inspection of potentially affected pipeline facilities following extreme weather events or natural disasters (49 CFR § 195.414). Due to the minimal risk of seismic and subsidence hazards in the Project Area, low risk of landslides due to the established stability in the previous work areas, a pipeline's ability to resist minor ground displacement, and PHMSA inspection requirements, impacts on the pipeline from geologic hazards during operations are expected to be minor.

In conclusion, construction and operation impacts associated with geologic hazards for Alternative 3 would not be significant.

Alternative 4

There would be no construction impacts under Alternative 4 because the Project was completed in 2017.

As discussed above, impacts on the pipeline from geologic hazards are expected to be minor and not significant during operation of the Project. No mitigation beyond designing the Project to currently accepted industry specifications and the PHMSA safety standards is necessary.

In conclusion, construction and operation impacts associated with geologic hazards for Alternative 4 would not be significant.

Alternative 5

If Alternative 5 is adopted, short-term, minor impacts from geologic hazards are anticipated. Due to the limited potential for large, seismically induced ground movements in North Dakota, including along the North Bismarck Reroute, no impacts associated with seismic activity are anticipated during construction. A majority of the alternative route is within land with a moderate susceptibility to, but low incidence rate of, landslides (Radbruch-Hall et al., 1982). The State of North Dakota Geological Survey provided an evaluation of the North Bismarck Reroute and found that it intercepts nine active landslides and a highly unstable and erodible east riverbank area with 608 landslides within a 5-mile corridor and 1,202 landslides within a 10-mile corridor. It is assumed that Dakota Access would implement the same or more protective BMPs as those used during construction of the DAPL Project to reduce the risk of landslides during construction and operation (including installation of temporary and permanent erosion controls, restoration of pre-construction contours, and prompt revegetation). Finally, karst terrain is not present along the Northern Bismarck Reroute; therefore, no impacts from this geologic hazard would occur (Weary and Doctor, 2014).

Further, maintained pipelines constructed using modern arc-welding techniques have performed well in seismically active areas of the United States, such as California (O'Rourke and Palmer, 1996). Only large, abrupt ground displacements have caused significant impacts on pipeline facilities. Due to the minimal risk of seismic, landslide, and subsidence hazards along the North Bismarck Reroute, a pipeline's ability to resist minor ground displacement, and PHMSA inspection requirements, impacts on the pipeline from geologic hazards during operations are expected to be minor.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of the about 100 miles of the DAPL Project would be similar to the effects described in Alternative 2. Multiple locations along the route may require excavation to expose, cut, and cap the pipe. Following the capping of the pipe, materials would be returned to the excavated areas and the surface would be stabilized and revegetated. These locations would likely be primarily within previously disturbed rights-of-way and result in temporary, negligible impacts.

Impacts associated with the short-term transportation of crude oil via rail and/or truck would be similar as described above in Section 3.2.1.3, [Geology] Alternative 5.

In conclusion, construction and operation impacts associated with geologic hazards for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts and geologic hazards associated with Alternative 1, the combined construction and operation impacts for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on geologic resources for Alternatives 5 and 2 would not be significant.

3.2.4. Paleontology

Section 3.2.4 discusses significant paleontological resources that may be found in the Project Area.

3.2.4.1. Project Background: Affected Environment and Impacts

The surficial geology in the Project Area is characterized by Quaternary glacial drift materials, which typically do not contain significant paleontological materials. However, the Fox Hills and Pierre formations underlay the glacial materials, and these formations have been found to contain diverse fossils, including marine reptiles (e.g., mosasaurs, plesiosaurs, sea turtles), fish (e.g., sharks and rays), birds, and invertebrates (Hoganson, 2006 as cited in USACE, 2016).

While there is potential for the bedrock formations underlying the Project Area to contain fossils, all activities, including HDDs, only affected the overlying unconsolidated sediments. Paleontological resources were not found during construction of the Project.

3.2.4.2. Current Affected Environment

There have been no changes to paleontological resources since the 2016 EA.

3.2.4.3. Impacts and Mitigation

Alternative 1

If Alternative 1 is adopted, it is possible paleontological resources may be identified during ground-disturbing activities during construction. Although a greater area of land would be affected by Alternative 1, sedimentary bedrock, which may contain paleontological materials, is not anticipated to be encountered. Therefore, the probability of encountering fossils or other significant materials in the unconsolidated glacial drift in the Project vicinity is anticipated to be low. 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) (see Appendix F of the 2016 EA) to avoid further impacts on these resources.

There would be no operational impacts on paleontological resources under this alternative because the pipeline would be shut down and removed from the Project Area.

In conclusion, construction and operational impacts on paleontological resources for Alternative 1 are not expected to be significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

If Alternative 2 is adopted, excavation of previously disturbed areas to expose, cut, and cap the pipe would be required. Therefore, the potential to encounter paleontological during construction is negligible. In the event paleontological resources are discovered during construction, Dakota Access would implement measures outlined in its UDP (see Appendix F of the 2016 EA) to avoid further impacts on these resources.

There would be no operational impacts on paleontological resources under this alternative because the pipeline would be abandoned in place and cease operations.

In conclusion, construction and operational impacts on paleontological resources for Alternative 2 are not expected to be significant.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternative 3

There would be no new construction impacts on paleontological resources under Alternative 3 because the Project was completed in 2017 and no paleontological resources were impacted.

As identified in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, the likelihood of one of the modeled WCD crude oil releases (inclusive of Optimization Project capacity) is remote to very unlikely, and the likelihood of a smaller, unmodeled release is remote to unlikely. If a release occurs, Dakota Access would minimize potential impacts by complying with the conditions of the easement. If excavation of previously undisturbed areas to remediate a release occurs, the probability of encountering fossils or other significant materials in the unconsolidated glacial drift in the Project vicinity is anticipated to be low, as discussed in Alternative 1. As such, the risk of impacts on paleontological resources from a crude oil release is expected to be negligible.

In conclusion, impacts from construction and operation of Alternative 3 (including the risk of a crude oil release) would not be significant.

Alternative 4

There would be no construction impacts on paleontological resources under Alternative 4 because the Project construction was completed in 2017.

Dakota Access would comply with the conditions of the easement to minimize impacts resulting from a crude oil release. The likelihood of a crude oil release is remote to unlikely (see Section 3.1.6.3). Additional conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release. Therefore, should a release occur, impacts on paleontological resources would be similar to or less than those described under Alternative 3 and the additional conditions would aid in minimizing the extent and impacts of a release.

In conclusion, impacts from construction and operation of Alternative 4 would not be significant.

Alternative 5

All of the North Bismarck Reroute geologic units have the potential to contain significant paleontological materials. For example, the Hell Creek Formation has yielded specimens from *Tyrannosaurus rex*, *Triceratops*, and many other prehistoric animals (Hoganson, n.d.). The USACE assumes that Dakota Access would follow its UDP in the event paleontological resources are discovered during construction. The UDP includes measures to stop work, notify appropriate contacts, and consult with a qualified geologist/paleontologist to protect the resource.

As identified in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, the likelihood of impacts from a WCD is remote to very unlikely. If a release occurs, Dakota Access would minimize potential impacts by complying with the conditions of the easement. If excavation of previously undisturbed areas to remediate a release occurs, the probability of encountering fossils or other significant materials in the unconsolidated glacial drift in the vicinity of the North Bismarck Reroute is anticipated to be low. As such, the impacts on paleontological resources from a crude oil release are expected to be negligible.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of the about 100 miles of the DAPL Project would be similar to the effects described in Alternative 2. Multiple locations along the route may require excavation to expose, cut, and cap the pipe. Following the capping of the pipe, materials would be returned to the excavated areas and the surface would be stabilized and revegetated. The USACE assumes that these locations would be primarily within previously disturbed rights-of-way; therefore, the potential to encounter paleontological during abandonment is negligible.

Impacts associated with the short-term transportation of crude oil via rail and/or truck would be similar as described above in Section 3.2.1.3, [Geology] Alternative 5.

In conclusion, construction and operation impacts on paleontology for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because the USACE assumes that Dakota Access would implement its existing UDP, the combined construction and operation impacts on paleontological resources for Alternatives 5 and 1 would not be significant. The combined construction and operation impacts on paleontological resources for Alternatives 5 and 2 would not be significant.

3.2.5. Soils

Soil characteristics in the Project Area were identified and assessed using the Soil Survey Geographic Database, which is a digital version of the original county soil surveys developed by the Natural Resources Conservation Service for use with Geographic Information System (GIS) (NRCS, 2015 as cited in USACE, 2016).

3.2.5.1. Project Background: Affected Environment and Impacts

The Project is located within the Rolling Soft Shale Plain Major Land Resource Area of North Dakota, South Dakota, and Montana. The dominant soil orders in the Rolling Soft Shale Plain are Mollisols and Entisols, which are shallow to very deep, generally somewhat excessively drained and loamy or clayey (NRCS, 2006 as cited in USACE, 2016).

The predominant soil type in the upland portion of the Project Area is the Flasher Vebar Parshall complex. As shown in Table 3.2.5-1, this complex accounts for 33 percent of the Project Area. The Flasher Vebar Parshall complex contains 36 percent Flasher or similar soils, 22 percent Vebar or similar soils, 15 percent Parshall or similar soils, and 27 percent minor components. The Flasher Vebar Parshall complex is formed from sandy residuum weathered from sandstone and is steep within the Project Area, with slopes ranging from 9 to 35 percent (NRCS, 2015 as cited in USACE, 2016). The Flasher Vebar Parshall complex is Hydrologic Soil Group D, which has very slow infiltration (high runoff potential) when thoroughly wet. A majority of the soils within the Project Area are neither frequently flooded nor frequently ponded.

Table 3.2.5-1: Soil Types Mapped within the Project Area

Soil Map Unit	Soil Map Unit Name	Project Area (acres) [a]	Farmland Rating	Hydrologic Group [b] (infiltration)	Hydric Rating [c]	Wind Erodibility Group [d]
E0623B	Grail-Belfield clay loams, 2–6 percent slopes	2.9	Farmland of Statewide Importance	C	0 percent	6
E0701F	Dogtooth-Janesburg-Cabba complex, 6–35 percent slopes	0.8	None	D	3 percent	6
E1423F	Flasher-Vebar-Parshall complex, 9–35 percent slopes	5.8	None	D	0 percent	2
E1823A	Parshall fine sandy loam, 0–2 percent slopes	0.7	Farmland of Statewide Importance	A	0 percent	3
E2601C	Amor-Cabba loams, 6–9 percent slopes	0.3	None	C	0 percent	6
E2803B	Amor-Shambo loams, 3–6 percent slopes	2.0	Farmland of Statewide Importance	C	0 percent	6
E3802B	Linton-Mandan silt loams, 2–6 percent slopes	2.6	Farmland of Statewide Importance	B	0 percent	5
E3813A	Grassna silt loam, loess, 1–2 percent slopes	1.7	Prime Farmland	B	2 percent	6

Soil Map Unit	Soil Map Unit Name	Project Area (acres) [a]	Farmland Rating	Hydrologic Group [b] (infiltration)	Hydric Rating [c]	Wind Erodibility Group [d]
E3813B	Grassna silt loam, loess, 2–6 percent slopes	0.5	Prime Farmland	B	2 percent	6
E4139A	Korchea-Fluvaquents complex, channeled, 0–2 percent slopes, frequently flooded	0.4	None	B	43 percent	4L
	Total	**17.7**				

[a] The Project Area includes Connected Action areas. Water is not included in this analysis.
[b] 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
[c] Hydric rating is the percentage of soil map unit with hydric soils.
[d] Wind erodibility group in cultivated areas: Group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible. 4L indicates calcareous soils.

The HDD minimized surficial soil disturbance in the Project Area. However, construction activities for the HDD entry and exit workspaces and pull-back area required clearing, grading, excavation, and backfilling, as well as the movement of construction equipment along the right-of-way, which resulted in temporary impacts on soil resources. Clearing removed protective cover and exposed soil to the effects of wind and precipitation, which may have increased the potential for soil erosion and movement of sediments into sensitive environmental areas. Grading and equipment traffic may have compacted soil, reducing porosity and percolation rates, resulting in increased runoff potential and decreased soil productivity. Excavation and backfilling may have led to a mixing of topsoil and subsoil, introducing rocks to the soil surface from deeper soil horizons.

Dakota Access implemented the mitigation measures described in the DAPL Project's SPCC, SWPPP, and ECP, as well as requirements of applicable state and federal permits. These measures included installation of erosion control devices (e.g., silt fence, straw bales, slope breakers, trench breakers, erosion control fabric, mulch); topsoil segregation in agricultural land; compaction monitoring and, if necessary, remediation (e.g., through use of chisel plow or other deep tillage implement); and revegetation of disturbed soils. In addition, implementing the HDD crossing method on federal lands minimized soil impacts between the HDD entry and exit sites. As a result, impacts on soils were temporary, minor, and not significant.

Prime Farmland

Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses. Other soils that do not meet the criteria for prime farmland may be considered farmland of statewide importance. These soils may produce high yields of crops when managed appropriately (NRCS, 2013 as cited in USACE, 2016). Climate is the primary limiting factor preventing farmland of statewide importance in North Dakota from being considered prime farmland; therefore, specific management techniques or other soil amendments cannot elevate farmland of statewide importance to a prime farmland designation (Sieler, 2015 as cited in USACE, 2016).

Approximately 12 percent of the soils in the Project Area are considered prime farmland. Additionally, 46 percent of the soils are designated as farmland of statewide importance. The remaining soils do not have a farmland designation. No prime farmland or farmland of statewide importance were converted to non-agricultural use from construction of the Project. As a result, construction impacts on prime farmland soils associated with the HDD entry and exit sites and pull-back area were temporary and minor.

3.2.5.2. Current Affected Environment

Since construction of the HDD, prime farmland and farmland of statewide importance were converted to non-agricultural use for the construction of two permanent access roads and mainline valve sites on each side of the Lake Oahe HDD. These access roads and mainline valves are not within the scope of the Project, but their presence has resulted in a change in the current affected environment.

3.2.5.3. Impacts and Mitigation

Alternative 1

If Alternative 1 is adopted, additional long-term, moderate impacts on soil resources are anticipated. As described above, major earthwork and engineering would be required to remove the constructed pipeline. Dakota Access has determined it would need to divert lake flow and excavate about 77 acres of the lake bed in two phases, resulting in a total of about 12.3 million cubic yards of excavated material that will need to be stockpiled. This action would result in disturbing the soil profile across the area. Storage of the spoil would require about 1,400 acres of land disturbance in upland areas adjacent to the lake. The greatest risk to soils would be sediment loss from the construction work area due to erosion of stockpiled material. Saturated, unconsolidated lakebed sediments that are removed and stored in upland areas would be challenging to manage and require a large workspace and extensive stabilization design (see additional discussion in Sections 3.2.1.3 and 3.2.3.3). Dakota Access, to the extent feasible, would restore the areas affected by pipeline removal to pre-construction contours; however, restoration to pre-existing conditions would be nearly impossible to achieve and could take decades to complete. Compaction of soils would occur from the placement of stockpiled materials and heavy equipment traffic over the extended construction period, affecting restoration of the surrounding lands. In addition, about 30 percent (250 acres of the 800 acres required for Phase I on the east side of Lake Oahe) is considered prime farmland.

There would be no operational impacts on soils under this alternative because the pipeline would be shut down and removed from the Project Area.

In conclusion, as a result of the effects identified above, construction activities associated with Alternative 1 would not result in significant impacts on soils.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

If Alternative 2 is adopted, additional temporary, minor impacts on soil resources are anticipated. Temporary impacts would mainly be limited to excavation of previously disturbed areas to expose, cut, and cap the pipe. Following the capping of the pipe, the area materials would be returned to the excavated areas and the surface would be stabilized and revegetated according to BMPs. About 13 acres of land would be temporarily impacted to access, excavate, store materials, and cut and cap the pipeline for abandonment in place.

There would be no operational impacts on soils under this alternative because the pipeline would be abandoned in place and cease operations.

In conclusion, construction and operational impacts on soils from Alternative 2 would not be significant.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternative 3

There would be no construction or operational impacts on soils under Alternative 3 because the Project was completed in 2017.

As identified in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, the likelihood of one of the modeled WCD crude oil releases (inclusive of Optimization Project capacity) is remote to very unlikely, and the likelihood of a smaller, unmodeled release is remote to unlikely. If a release occurs, Dakota Access would minimize impacts by complying with the conditions of the easement. While impacts related to unmitigated release scenarios are discussed, impacts intensities used to determine significance are based on the assumption that Dakota Access would promptly clean up and remediate impacted areas in the event of a crude oil release, as is required under applicable federal regulations. Based on the modeling, impacts on soils from the release itself would be temporary and range from negligible to moderate. Impacts would be worse where an unmitigated release occurred, during ice-free conditions, at the ND-380 valve site or under the lake. Modeling estimated that a release under these conditions would result in up to 9.29 g/ft^2 of oil being dispersed intermittently along 0.8 to 46.3 miles of shoreline (see Section 3.1.6). Modeling conducted for scenarios where mitigation was implemented estimated that a release from under the lake during ice-free conditions would result in up to 9.29 g/ft^2 of oil being dispersed intermittently along 5.2 to 11.1 miles of shoreline (see Section 3.1.6). However, as described in Section 3.1.6.3, the modeling for the mitigated scenarios assumed different baseline conditions and is therefore not directly comparable to the unmitigated scenarios. Under ice-covered conditions, impacts on the shoreline from a release under the lake would be negligible as the oil would be contained under the ice. In-situ remediation of contaminated soils would result in long-term, moderate impacts before successful restoration is achieved. If excavation and replacement of contaminated media occurs, impacts on soils resources would be similar to those that occurred during Project construction (e.g., soil erosion, compaction, revegetation concerns). As such, a WCD crude oil release would result in a negligible to minor risk on soils.

In conclusion, construction and operational impacts on soils from Alternative 3 would not be significant.

Alternative 4

There would be no construction or operational impacts on soils under Alternative 4 because the Project was completed in 2017 and additional mitigation measures are not proposed.

Additional conditions on the easement under Alternative 4 focus on earlier detection of a release and improved response times to a release. The conditions would minimize impacts resulting from the remote to very unlikely occurrence of a WCD crude oil release (see Section 3.1.6), which is inclusive of Optimization Project capacity. Therefore, should a release occur, impacts on soils would be similar to or less than those described under Alternative 3 and the additional conditions would aid in minimizing the extent and impacts of a release. In-situ remediation of contaminated soils would result in long-term, moderate impacts before successful restoration is achieved. If excavation and replacement of contaminated media occurs, impacts on soils resources would be similar to those that occurred during Project construction (e.g., soil erosion, compaction, revegetation concerns). As such, a WCD crude oil release would result in a negligible to minor risk on soils.

In conclusion, construction and operational impacts on soils (including the risk of a crude oil release) from Alternative 4 would not be significant.

Alternative 5

The North Bismarck Reroute would cross similar soils as the 100-mile-long existing route, but would result in about 111 miles of new short-term, minor impacts, with the exception of the mainline valves, which would have permanent, minor impacts. Construction activities, such as clearing, grading, trench excavation, backfilling, and the movement of construction equipment along the right-of-way may affect soil resources. Clearing removes protective vegetation cover and exposes the soil to the effects of wind and rain, which increases the potential for soil erosion and sedimentation of sensitive areas. Grading, spoil storage, and equipment traffic could compact soil, reducing porosity and increasing runoff potential.

During pipeline construction, topsoil and subsoil will be disturbed as a result of topsoil removal, grading, excavation, and by heavy equipment moving throughout the Project workspace. Topsoil is rich in organic matter and nutrients, which are essential for crop growth. The potential mixing of topsoil or surface soil with the subsoil from these activities could result in a loss of soil productivity and affect soil fertility and crop yields, soil moisture, and soil erosion; however, standard construction BMPs such as those used to construct the original DAPL Project pipeline (including topsoil segregation techniques, erosion control measures) minimize and mitigate these effects.

Excess rock or fill material brought to the surface during trenching operations could hinder restoration of the right-of-way. The USACE assumes that Dakota Access would implement the same or more protective BMPs as those used during construction of the Project to reduce the impact during construction and operation (including installation of temporary and permanent erosion controls, topsoil segregation, and revegetation techniques).

Ditch and contour settling during restoration activities can occur because soil piles containing moisture, especially when frozen, settle as the soil dries. However, BMPs during construction (especially during winter construction) include mounding the backfill of the trench to account for potential settling and performing post-construction inspections and restoration practices.

Heavy equipment used during pipeline construction, and pickup trucks using designated work travel lanes, can compact the soil making it difficult for crops to grow. However, standard construction BMPs for pipelines include decompaction techniques (e.g., use of a paraplow or other deep tillage implements) as workspace is restored.

Should a crude oil release occur during operation of the North Bismarck Reroute, impacts on soils would depend on extent and remediation method. Impacts could range from temporary, minor impacts (e.g., shallow excavation to replace contaminated soils) to long-term, major impacts similar to Alternative 1 (e.g., deep excavation to replace contaminated materials and repair/replace any HDD segments).

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of the about 100 miles of the DAPL Project would be similar to the effects described in Alternative 2. Multiple locations along the route may require excavation to expose, cut, and cap the pipe. Following the capping of the pipe, the area materials would be returned to the excavated areas and the surface would be stabilized and revegetated. The USACE assumes that these locations would be primarily within previously disturbed rights-of-way and result in temporary, minor impacts.

Effects associated with the transportation of crude oil via rail and truck would be similar as described above in Section 3.2.1.3, [Geology] Alternative 5.

In conclusion, construction and operation impacts on soils for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The combined construction and operation impacts on soil resources for Alternatives 5 and 1 or 5 and 2 would not be significant.

3.3. WATER RESOURCES

This section discusses the affected environment and impacts on surface waters (e.g., water quality and beneficial uses), groundwater, wetlands, floodplains, and levees within the Project Area.

3.3.1. Surface Waters

Surface waters consist of streams, lakes, ponds, and certain impoundments. Streams can be further characterized by the flow regime:

- Perennial—Surface water flowing continuously year-round.
- Intermittent—Surface water flowing continuously during certain times of the year and more than in direct response to precipitation (e.g., seasonally when the groundwater table is elevated or when snowpack melts).
- Ephemeral—Surface water flowing or pooling only in direct response to precipitation, such as rain or snow fall.

Surface waters within the Project Area (see Figure 3.3.1-1) include Lake Oahe (waterbody ID s-kc4-em-001) and an unnamed ephemeral drainage (waterbody ID s-kc4-mo-002). An additional ephemeral drainage (waterbody ID s-kc4-mo-004) was identified along the HDD pull-back path on the western shore of Lake Oahe.

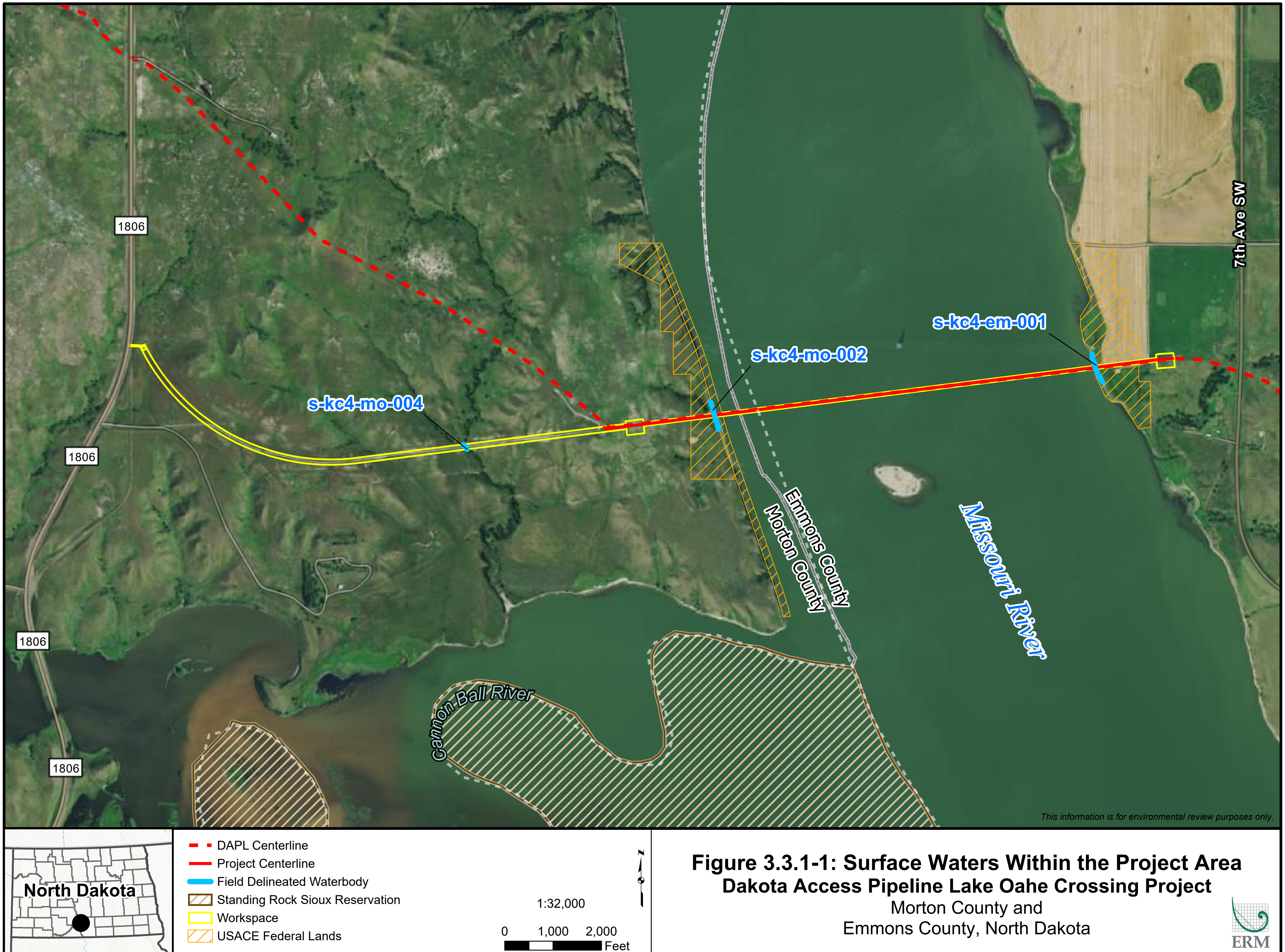

Figure 3.3.1-1: Surface Waters Within the Project Area
Dakota Access Pipeline Lake Oahe Crossing Project
Morton County and
Emmons County, North Dakota

ERM

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3.3.1.1. Project Background: Affected Environment and Impacts

Watersheds are classified by surface areas that drain all the streams and rainfall into a common outlet (i.e., stream, river, lake), which can be defined by topography. Many smaller watersheds (also known as sub-basins and subwatersheds) are contained within larger watersheds. As described in the 2016 EA, Lake Oahe is a large reservoir formed behind the Oahe Dam on the Missouri River. Lake Oahe forms the border between Morton and Emmons counties in the Upper Lake Oahe Watershed (Hydrologic Unit Code [HUC] 10130102) within the Missouri River Basin.

The Oahe Dam is located 6 miles north of Pierre, South Dakota, and was placed into operation in 1962. At maximum normal operating pool level (1,617 feet mean sea level), Lake Oahe extends roughly 231 miles from the Oahe Dam in South Dakota to near Bismarck, North Dakota. At this level, the lake covers approximately 360,000 acres. The lake has over 2,250 miles of shoreline at base flood control elevation (1,607.5 feet mean sea level).

The Project Area is located within the northern segment of Lake Oahe. This segment is more river-like in appearance and is characterized by submerged and emergent snags, sandbars, many shallow areas, and a definite current (USACE, 2010a as cited in USACE, 2016). The water depth along the pipeline alignment ranges from approximately 3 feet at its shallowest point in the crossing area to approximately 30 feet at its deepest; however, the pipeline was installed between approximately 95 and 126 feet beneath the lake bed.

Sensitive Waters

Section 305(b) of the CWA requires each state to submit a report on the quality of the state's surface and groundwaters to the EPA every 2 years. Section 303(d) of the CWA requires that each state review, establish, and revise water quality standards for all surface waters within the state. To ensure water standards meet their designation, each state develops a classification system and monitoring and mitigation programs. Waters that fail to meet their designated use are considered impaired and are listed under a state's 303(d) list of impaired waters. For each waterbody on the list, the state identifies the pollutant causing the impairment and assigns priority for the development of a Total Maximum Daily Load (TMDL) assessment based on severity of pollution. A TMDL assessment is a plan of action used to clean up streams that are not meeting water quality standards. The plan includes identification of a pollution; a calculation of the maximal amount of a particular pollutant a stream, lake, estuary, or other waterbody can withstand without violating state water quality standards; and strategy development for contaminant source reduction or elimination. The final 2018 Section 303(d) list includes a list of waterbodies not meeting water quality standards and those for which a TMDL assessment is needed (NDDOH, 2019).

According to North Dakota Administrative Code 33-16-02.1-09, Lake Oahe is classified as Class I water because it fully supports all its beneficial uses: "the propagation or protection, or both, of resident fish species and other aquatic biota and for swimming, boating, and other water recreation." The ephemeral stream within the Connected Action Area (s-kc4-mo-004) is a Class III water, defined as "water suitable for agricultural and industrial uses and characterized by low average flows with prolonged periods of no flow," and is also not listed as needing a TMDL. None of the waterbodies identified for analysis in this

EIS were classified as impaired according to the 2018 North Dakota Department of Health (NDDOH) Integrated Report (NDDOH, 2019). There were no impacts on sensitive waters during construction.

Water Intakes and Source Water Protection Areas

Water intakes and the surrounding areas managed to protect the water in the Project Area are regulated by the North Dakota Department of Water Resource's Sovereign Lands and Water Appropriation Programs and the NDDEQ's Source Water Protection Program, which has three federally mandated program elements for public (non-tribal) water systems including:

- The delineation of a wellhead protection area (for groundwater-dependent public water systems) or source water protection area (for surface water-dependent public water systems) based on existing hydrogeologic and geologic information;
- A contaminant source inventory that identifies the presence and location of sources or activities within the protection area that may contaminate groundwater or surface water; and
- A susceptibility analysis that determines the ranking of public water systems wells or intakes to contamination by sources inventoried within the protection area.

Tribal water intakes are regulated by EPA Region 8. There are no surface water intakes in the Project Area. However, based on the review of the source water protection status list of North Dakota's public water systems, the Project Area is within the mapped South Central RWD – Emmons (ND1501653) source water protection area (NDDEQ, 2021a) for community surface waters. The North Dakota Source Water Protection Program was developed in response to the 1996 Safe Drinking Water Act amendments and aims to 1) prevent contamination of public water supplies; 2) encourage the placement of certain activities in areas less likely to contaminate public water supplies; and 3) raise public awareness of water resources used for public water supplies (NDDEQ, 2021a).

WCD crude oil release modeling was performed to evaluate the impacts on water intakes from a release (see PHMSA and FRP Modeling Reports [Appendix G]). The PHMSA and FRP Modeling Reports identified 14 water supply intakes along an 80-mile segment of the river (see Table 3.3.1-1). Of these 14 water supply intakes, two are identified for drinking water (intakes #5 and #14). Drinking water intake #7 was previously used to supply drinking water to the SRST; however, due to water levels, the intake was taken offline. Intake #7 was removed from service, and intake #14 currently serves as the SRST Drinking Water Intake. The remaining functional intakes are used for agricultural purposes.

Table 3.3.1-1: Water Intakes Identified within 80 Miles of the Project Area

Water Intake [a]	Description/Owner	Distance Upstream/Downstream of Crossing Location (miles)
Upstream		
1	Upstream Intake [b]	3.6
2	Upstream Intake [b]	2.2
Downstream		
3	Local Agricultural Intake [c]	4.4
4	Tribal Agricultural Intake [c]	8.1
5	South Central RWD Intake [c]	11.3

Water Intake [a]	Description/Owner	Distance Upstream/Downstream of Crossing Location (miles)
6	Unspecified Intake	24.1
7	Fort Yates Municipal Drinking Water Intake [d]	26.8
8	Unspecified Intake	27.9
9	Tribal Farms Agricultural Intake	29.3
10	Unspecified Intake	37.5
11	Unspecified Intake	38.7
12	Unspecified Intake	43.0
13	Unspecified Intake	47.1
14	SRST Drinking Water Intake [e]	75.4

Source: PHMSA and FRP Modeling Reports (Appendix G)

RWD = Regional Water District; SRST = Standing Rock Sioux Tribe
[a] Although all known drinking water intakes within the model are represented, it is recognized that additional agricultural / other purpose intakes may be present. What has been modeled is a representative sample of intakes spanning nearly 80 miles of the Missouri River and Lake Oahe. Note that the operation of some intakes may depend on the season.
[b] The crude oil release model identified upstream intakes to account for the potential upstream transport of surface crude oil by wind.
[c] Information supplied by USACE.
[d] The former Fort Yates Municipal Drinking Water Intake is offline and not in use (USACE, 2018).
[e] This intake is located outside of the model, and crude oil was not predicted to reach this location within the modeled 10-day timeframe.

During construction, the pipeline was installed between approximately 95 and 126 feet beneath the bottom of Lake Oahe using the HDD method. The use of this construction methodology allowed the pipeline to be buried at depths that provide protection from risks associated with high water levels, floods, and bed scour of Lake Oahe. The depth of the HDD provides a barrier between the pipeline and water that would impede the ability of any crude oil from reaching the lake bed. Additionally, the Pierre Shale aquitard, which is a relatively impermeable aquitard, lies between the pipeline and the water. There were no inadvertent or incidental releases of drilling fluids (bentonite clays mixed with water) recorded during the HDD process resulting in releases of contaminants to surface waters during construction-related activities in the Project Area during the 2017 installation of the pipeline. Sediment runoff resulting from precipitation events was mitigated by setting back the east and west HDD workspaces about 900 and 1,100 feet, respectively. Sediment control measures specified in the Project ECP and SWPPP were also implemented and maintained to prevent sediment-laden water from entering Lake Oahe during the HDD process. The use of these sediment control measures averted increases in turbidity and sediment load levels to the lake. Following construction, the right-of-way was restored, revegetated, and monitored in accordance with applicable regulations and permit conditions. Chapter 1, Introduction and Background, and the 2016 EA provides a detailed description of the HDD process, potential impacts that were identified prior to construction, and safeguards to follow in the event of a release.

Water used during the Lake Oahe HDD installation (bentonite slurry) and hydrostatic testing was obtained from municipal water sources and a well at the HDD worksite. The well was installed in 2016, and the driller’s log was filed with the North Dakota Department of Water Resources; however, a permit was not required because the well was projected to draw less than 12.5 acre-feet of water per year. Once complete, the hydrostatic test water was discharged to uplands in the HDD workspace on the west side of Lake Oahe in accordance with the requirements of the General Permit for Temporary Discharges issued by the NDDOH on May 9, 2016. No records are available indicating that any discharged water entered Lake Oahe either directly or indirectly.

Given that the pipeline was installed beneath Lake Oahe via the HDD method with workspaces approximately 900 and 1,100 feet from the bank of the waterbody, with no recorded inadvertent releases of drilling fluid, and no water was withdrawn from or discharged to Lake Oahe during hydrostatic testing, construction had a temporary, negligible impact that was not significant on surface water intakes and source water protection areas.

During operation, maintenance of the permanent right-of-way in the Project Area has not required earth-moving activities, averting erosion and sediment runoff into Lake Oahe. Inspection and maintenance equipment (e.g., utility terrain vehicle, pickup trucks, and mowers) could unintentionally release contaminants while approaching Lake Oahe. However, to date, no contaminant releases have been recorded during operations. Operational and ongoing maintenance activities do not require diversion or appropriation of water from Lake Oahe. Therefore, based on ongoing activities to date, operation has a temporary, minor impact that did not significantly impact the lake water volume or water quality.

3.3.1.2. Current Affected Environment

There have been no changes to the affected environment of surface water resources since the 2016 EA. Public comments received during the scoping period requested information on whether baseline monitoring for the Missouri River would be completed as part of the EIS, including hydrocarbon baseline information. The NDDEQ Surface Water Quality Data Portal identifies three water quality monitoring locations along Lake Oahe that were established prior to construction of the DAPL Project, with publicly available information from 1999 to 2011 on multiple water quality parameters such as pH, specific conductance, temperature, and dissolved oxygen levels (NDDEQ, 2021b).

Many public comments received during scoping emphasized the importance of water to the Tribes, often stating “water is life” and expressing concerns about impacts on water quality and downstream users should the pipeline remain in operation. The SRST has emphasized that impacts of a crude oil release to surface waters would have broader implications than just drinking water, including impacts on their culture and way of life, as well as economic impacts (e.g., casino and lodge supply and ferry for patron transport). While this section of the EIS focuses on water quality and drinking water, the overlapping impacts with these other concerns are discussed in Section 3.8, Socioeconomics, Environmental Justice, and Health.

3.3.1.3. Impacts and Mitigation

Alternative 1

Alternative 1 would entail removing the pipeline from beneath Lake Oahe. Section 2.5.1, Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required, provides a detailed description of the conceptual construction methodology that could be required to remove the pipeline. Prior to removal, the pipeline would be shut down. Removing the pipeline would involve constructing cofferdams extending approximately 3,400 feet across Lake Oahe. Once the cofferdams are constructed, the area of the lake inside the cofferdams would be dewatered (e.g., temporary damming, sheet piling, or pumping/diversion) to create a safe workspace to expose and remove the pipeline. The work area would then be backfilled and restored, removing the cofferdams. Upon restoration, an approximately 2,500-foot-long cofferdam would be constructed from the opposite side of the lake essentially repeating the process to remove the remainder of the pipeline. The removal of the pipeline though this process would take from about 6 to 20 years or more to complete. Cofferdams within the river channel will alter flow in those locations, which could lead to increased scouring and shoreline erosion, a risk to tribally important resources.

The excavation of the pipeline under Lake Oahe would require an approximately 77-acre footprint with an additional approximately 1,400 acres of land to temporarily stockpile excavated spoil onshore. The conceptual spoil storage areas could impact two mapped waterbodies; however, implementation of BMPs would reduce impacts on these waterbodies. Additionally, Project design would incorporate avoidance of mapped waterbodies to the extent possible. Although access roads between the excavation and the storage areas have not been identified, access road crossings could impact additional waterbodies.

Excavation and backfilling, as well as construction traffic and excavation stockpiling, would result in a long-term duration of impacts on water quality. These impacts include increased runoff and rate of in-stream sediment loading, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, thermal effects, modification of riparian areas, and introduction of chemical contaminants such as fuel and lubricants. The extent of the impact would depend on sediment loads, flow velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and downstream extent of sediment migration. The pipeline removal could also result in alteration of lake bottom contours. Changes in the lake bottom contours can alter stream dynamics and increase downstream erosion or deposition, the effects of which could extend beyond the completion of the excavation work. Turbidity resulting from resuspension of sediments from pipeline removal and erosion of disturbed soils adjacent to the lake would reduce light penetration and photosynthetic oxygen production within the water column. Lake bed disturbance could also introduce chemical and nutrient pollutants, if initially stored in the sediments. Resuspension of deposited organic material and inorganic sediments can increase biological and chemical use of oxygen, and decrease dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could affect aquatic organisms. Impacts on aquatic species and habitat associated with this alternative are further discussed in 3.5.2.3, [Wildlife and Aquatic Resources] Impacts and Mitigation.

The clearing and grading of the upland areas surrounding Lake Oahe would reduce riparian vegetation and expose soil to erosional forces for the duration of construction. The use of heavy equipment for construction over time would compact near surface soils, increasing runoff into surface waters in the immediate vicinity of the work area right-of-way. Increased surface runoff could transport sediment from uplands into surface waters, resulting in increased turbidity levels and increased sedimentation rates in the receiving waterbody during construction and restoration periods. Erosion and sediment control measures in the Project ECP and SWPPP would be implemented to reduce these impacts.

Section 3.5.2, Aquatic Resources, provides a detailed sediment transport model analysis for dewatering the cofferdams. Based on sediment transport modeling, sediments would fall out of suspension at varying distances from the excavation site, with the smallest particles expected to travel about 160 miles downstream. The majority of the sediment load would likely be a result of dewatering, despite the implementation of mitigation measures including silt fences, straw barriers, sandbags, plastic sheeting, benching, berms, and flow collection drainage paths to remove sediment loading prior to entering the well of the dewatering pumps. Lake Oahe's Class I water quality designation would be affected during these activities because the water in the immediate area would not be suitable for fish and other aquatic organisms nor water recreational activities. Impacts on fish and aquatic organisms are described in Section 3.5.2.3, [Wildlife and Aquatic Resources] Impacts and Mitigation. The long duration of excavation activities to remove the pipeline would result in negative impacts on water quality. Upon conclusion of the pipeline removal work, suspended sediment levels would be expected to return to pre-construction conditions.

A release of fuel, oil, or other hazardous materials to water from refueling or storage would degrade water quality immediately downstream of the incident.

There would be no operational impacts on Lake Oahe under Alternative 1 because the pipeline would be removed and the right-of-way and workspaces restored to pre-construction conditions. A shutdown of the pipeline would have no operational impact on surface waters.

With the implementation of BMPs and mitigation measures, Alternative 1 would have moderate, long-term impacts that could limit the current use of the waterbody for aquatic species and recreation. Water quality conditions are expected to return to baseline within 1 to 2 years of restoration, depending on flow conditions in the channel. As a result, these impacts would not be considered significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also likely include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Section 2.5.2, Alternative 2: Easement is Not Granted and No Further Action, provides a detailed description of the construction sequence to abandon the pipeline in place. Abandonment would include shutting down the pipeline, excavating the pipeline segment near the HDD workspaces to cut and purge the pipeline, and capping of the pipeline. Two temporary workspaces and access roads would be constructed. Following pipeline abandonment, excavated areas would be backfilled, and the temporary work areas and access roads would be restored to previous conditions.

Impacts on surface waters as a result of this alternative would be similar to those identified under Alternative 1; however, the scale of impact would be greatly reduced. These impacts include increased runoff and rate of in-stream sediment loading, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, thermal effects, modification of riparian areas, and introduction of chemical contaminants such as fuel and lubricants.

These impacts would be minimized by installing and maintaining sediment control measures and implementing BMPs to prevent sediment-laden water from entering Lake Oahe during the abandonment activities. Indirect impacts on aquatic organisms are discussed in Section 3.5.2.3. Impacts on water-based recreation would be negligible and temporary because of the short duration of construction activities and minimal disturbance. Additionally, BMPs would further reduce these impacts.

There would be no operational impacts on Lake Oahe under Alternative 2 because the section of pipeline would be abandoned and no longer operational. Additionally, following abandonment, the temporary work areas and access sites would be restored to pre-construction conditions. A shutdown of the pipeline would also have no operational impact on surface waters.

Alternative 2 would be expected to result in temporary negligible impacts on water quality, and surface water intakes that would not be significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the likely combined impacts of Alternatives 2 and 5 are described under Alternative 5 below.

Alternative 3

Under Alternative 3, the pipeline under Lake Oahe would continue to operate with the same conditions set forth in the previous easement issued on February 8, 2017. This alternative would not require any additional ground-disturbing activities within the Project Area; thus, no construction related impacts on Lake Oahe would occur.

Under normal operating conditions, operation of the pipeline under Alternative 3 would not be expected to result in any impacts on surface waters. However, impacts of Alternative 3 include the risk of a WCD crude oil release, which would affect water quality and water intakes.

Water Quality

An in-water crude oil release would impact water quality, both at the surface and throughout the water column. It would be expected that a majority of the oil would float to the surface; however, portions of soluble hydrocarbons could dissolve, and wind could cause some surfaced oil to become entrained in the water column. A release beneath the lake bed would require oil to travel through the cemented bentonite encasement around the pipeline and approximately 95 to 126 feet of low-permeability alluvium deposits, reducing oil amounts entering Lake Oahe; the scenarios conservatively assume that the entire modeled volume of oil enters the lake water with a total release duration of 32.4 minutes under a 12.9-minute shutdown time (PHMSA Modeling Report, Appendix G). Oil resulting from an onshore, underground pipeline rupture would travel overland before entering waterways and Lake Oahe. The State of North Dakota has classified Lake Oahe as a Class I water, which means the water quality designated uses of concern are fish, aquatic biota, swimming, boating, and other water recreation. Swimming, boating, and other water recreation uses could be affected at surface water oil thickness greater than 0.01 μm, the first sign of a barely visible sheen. As described in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, in the worst-case unmitigated scenario modeling, this occurred intermittently down to 30 to 50 miles downstream in ice-free conditions and within 2 miles downstream in the form of subsurface whole oil under ice. Fish and aquatic biota could be affected when DHC are greater than 1 μg/L, which was modeled to occur between 38 and 60 miles downstream in ice-free conditions. Under 100 percent ice cover conditions, the oil would be trapped as whole oil underneath the ice within approximately 2 miles from the release location. The DHC would not be present throughout the modeled 10-day period,[30] across the entire lake width, or at all depths, and would change as time progresses. Despite 38 to 60 miles of potential downstream reach, only up to 2.4 mi^2 is predicted to experience mortality effects. Moreover, Dakota Access would be required to implement mitigation measures that would restrict the downstream dispersal of crude oil. While modeled mitigated scenarios assumed different environmental conditions at the time of release (e.g., winds and currents) and are therefore not directly comparable to the unmitigated scenarios, mitigation efforts are likely to reduce the amount and downstream transport of oil due to containment and collection activities, likely reducing the impact intensity compared to the unmitigated scenarios. This is evidenced by the decrease in the predicted range of surface, in-water, and shoreline effects associated with the response-mitigated scenarios (see Tables 3.1.6-2 and 3.1.6-3).

Crude oil on the surface of the water would have negative impacts on the recreational and economic uses of the lake, as well as aquatic and terrestrial wildlife that rely on the lake for habitat and as a source of drinking water. Impacts on wildlife and aquatic organisms and recreation are further discussed in Section 3.5, Wildlife and Aquatic Resources, and Section 3.8, Socioeconomics, Environmental Justice, and Health. Additionally, tribal treaty rights to hunt, fish, and gather plants in and around Lake Oahe would be negatively impacted by any effect on wildlife and aquatic resources resulting from water quality degradation from a pipeline rupture. The ephemeral stream within the Connected Action Area (s-kc4-mo-004) is classified as a Class III water, where agricultural and industrial uses are the water quality designated uses of concern. Impacts on agricultural water intakes are discussed below and impacts on agricultural and other land use activities within the Project Area are discussed in Section 3.6.2, [Land Use and Recreation] Land Use.

Crude oil is a complex combination of hydrocarbons and other compounds, with its composition varying between different geographic regions and crude oil types. As a result, the physical and chemical properties of crude oil can also vary. The variability in fate and transport of crude oil components through the environment is reflective of the variation in the crude oil composition the physical and chemical properties of each constituent. One metric that captures some of this range is the carbon range (number of carbon atoms), which is directly related to the molecular weight of the various components. The carbon range and the molecular weight, among other parameters, affect the volatility, water solubility, and viscosity of various crude oil components, which in turn control the fate and transport of crude oil in the environment (American Petroleum Institute Petroleum HPV Testing Group, 2011). Section 3.1, Reliability and Safety, discusses the light sweet crude oil transported in the pipeline. The environmental fate and transport of crude oil after a release depends upon a variety of site-specific conditions at the time of the release, the physical and chemical properties of the crude oil, and the speed and the efficiency of the cleanup processes.

The migration pathways for crude oil within the environment depend to a large extent on the physical properties of the crude oil components, primarily molecular weight. Upon being released to the environment, the components of crude oil partition into various environmental media depending upon the

[30] See Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, for discussion on the 10-day modeling timeframe.

molecular weight of the components including 1) lighter components with a low molecular weight that readily evaporate into the air or easily dissolve in water; 2) intermediate molecular weight components, which evaporate or dissolve more slowly, and will persist on the water surface, emulsify, or adsorb onto sediments; and 3) heavy-weight components that persist in the environment for long periods of time. If large volume releases occur into water, crude oils will typically float to the water's surface. After floating on the water surface for an extended period of time, some components of crude oil will evaporate, dissolve, photo-oxidize, and biodegrade. Some components may adsorb to suspended sediments within the water column, where they may descend to the bottom of the waterbody and enter the sediments. In other circumstances, whole oil droplets may adhere to suspended sediment in the water column, forming oil-mineral aggregates that may sink the whole oil to the bottom, where it may later resuspend.

Based on the combination of toxicity, solubility, and bioavailability, benzene, an aromatic which has a low molecular weight, is commonly considered to pose a toxicity threat from crude oil releases (Muller, 1987 as cited in USACE, 2016). Though considered toxic in the dissolved state (as a DHC), the majority of benzene will evaporate into the air within hours when oil is on the water's surface, and from the air within days (Turner, Mason & Company, 2014; USDHHS, 2007). Mid-weight DHC compounds including PAHs also may have toxic effects. PAHs take longer to break down through evaporation or diffusion and migrate through the water column more readily (CB&I Environmental and Infrastructure, Inc., 2018). Higher-weight constituents typically have the largest potential for effects due to their longer exposure times in the water column. The heavy molecular weight components of oil would persist in the environment for longer periods of time. The heavy residual fraction would pose risks to recreational users and plants and wildlife until mechanically removed from the environment. A release would have greatest water quality impacts on the area immediately adjacent to the release site, but downstream water quality would also be affected to a lesser extent.

The impacts of the crude oil release on water quality would be dependent on the size and location of the release and immediacy of the containment and cleanup response to the release. In the event of a release, Dakota Access would respond according to the measures in their 2021 FRP and GRP, which are included in Appendix F of this EIS. Release response and cleanup measures would be implemented by Dakota Access and responsible state and federal agencies, ensuring that any release would be contained and cleaned up in a timely manner. Therefore, water quality would be restored and impacts on water quality and designated uses would be temporary to long-term and range in severity from minor to moderate depending on size, location, and severity of release. Implementation of Dakota Access's FRP and GRP would further minimize impacts on water quality and designated uses.

Additional unmodeled release scenarios assessed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, include releases that could impact water quality (e.g., if the released oil followed the HDD profile to the former HDD site and reached the surface before flowing downhill to the lakeshore or a slow onshore release at a valve site). Dakota Access would be required to promptly clean up and remediate impacted areas in the event of a crude oil release. If oil cleanup and other mitigative measures are responsive, immediate, and repetitious in accordance with requirements, a release would result in minor to moderate impacts on water quality depending on the location, volume, and extent of the release. The duration of the impact on water quality would range from temporary to long-term depending on the immediacy of Dakota Access's response and the overall remediation timeframe. However, the likelihood that water quality would be affected is remote to unlikely due to safeguards such as monitoring and leak detection. As a result, the risk ranking would range from negligible to moderate and not result in a significant impact on water quality.

Water Intakes

The PHMSA and FRP Modeling Reports (Appendix G) include additional SIMAP modeling to determine the predicted levels of unmitigated contamination that may be experienced at water intakes located upstream and downstream of the modeled release point in both ice-free and ice-covered conditions. The locations of the modeled water intakes are identified in Table 3.3.1-1. The SIMAP model predicted three-dimensional time-varying concentrations to more accurately represent impacts at different depths throughout the entire water column, from the near surface down to the bottom, which includes the depths.

The results of these modeling efforts indicate that it is possible for there to be contamination in near surface waters associated with floating oil and surface mixing, while the subsurface water may be contaminant-free. None of the representative 95th percentile scenarios between the two reports were predicted to have contamination reach intakes #1 or 2, as the intakes are located upstream of the Lake Oahe crossing, and wind conditions on the modeled days did not result in transport to the north. Modeling predicted that the contamination plume would pass completely by intakes #3 through 7 within the 10-day modeled period. Downstream of intake #7 may be affected but would have only been exposed to a portion of the plume by day 10. The SRST Drinking Water Intake (#14) was not predicted to be impacted within the 10-day period under any modeled scenario. Intakes #11 and #12 were selected for analysis because the intakes would provide conservative representations of impacts (i.e., higher concentrations) on intake #14, the SRST intake. The SRST intake is between 18 and 24.4 meters (60 to 80 feet) deep depending on seasonal surface water elevation changes.

The maximum concentration of DHCs within each 16.4-foot (5-meter) depth interval for the full vertical water column profile was determined for the unmitigated release scenarios. Insoluble hydrocarbons would either remain at the surface of the water and adhere to shorelines or sink to the bottom depending on their molecular density. Between the two modeling reports, maximum concentrations of DHCs at intake #7 reached 534 µg/L at the 0 to 16.4 foot depth interval. Intakes #11 and #12 reached 444 and 429 µg/L at the 0 to 16.4 foot depth interval, respectively.[31] Generally, the maximum unmitigated concentration was at the surface depth of 0 to 16.4 feet, likely associated with floating oil and entrained oil droplets. In open waters, wind-induced surface breaking waves are the primary cause of entrainment. Concentrations decreased in the water column as depth increased until near zero values were predicted at depths greater than 32.8 feet (10 meters) for all three intakes. This is a key factor in predicting impacts on water intakes because concentrations may be high near surface waters but low at the intake depth. Based on the

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[31] The maximum predicted concentrations at each intake location were selected from 580 model runs for each modeling report, each under differing environmental conditions depending on their start date. The predicted extent of the unmitigated trajectories and transport of surface oil varied by scenario based on local wind, current, and high or low flow conditions during each modeled 10-day period.
The reported concentrations would be considered "worst-case" for all model runs (maximum value at each point from all model runs for WCD volume, under worst-case environmental conditions, that resulted in worst-case effects). However, the reported maximum concentrations for other intakes did not necessarily occur within the same model run. When comparing the maximum concentrations, the different release volumes, start dates, and environmental and hydrologic forcing (which result in different trajectory and fate of released oil) are major drivers in the differences between simulations.

modeling, this suggests that no DHC concentrations are predicted at depths greater than 32.8 feet or beyond 65 miles of the release location within the 10-day unmitigated modeling period.

The unmitigated modeling indicates that the surface plume from the WCD would reach the locations of intakes #3 through 13. Intake #7 is offline and would be unaffected. Intake depths are required by USACE to be located 20 feet or deeper, so intakes that are between about 20 and 32.4 feet and within 65 miles of the release location could be affected through the uptake of DHCs suspended in the water column. At a minimum, intakes #3 through #11 would need to be shut down in the event of a pipeline rupture. Intake operators would be notified of a release to shut intakes down. This would affect the available supply of water to the users until cleanup and restoration is complete and the intakes can go online again. For precautionary reasons, other intakes in Lake Oahe could be shut down as well. Impacts on water intakes would be temporary to long-term and moderate to major depending on the depth of the intake, how long the intakes are offline, and the implementation of mitigation measures discussed below. Due to safeguards such as monitoring and leak detection, the likelihood of a WCD occurring is remote to very unlikely. As a result, the risk ranking would range from negligible to moderate and not result in a significant impact on water quality.

Public comments indicate that the greatest concern for surface water posed by a release is to the water intake structures, specifically the South Central RWD intake (#5) and the SRST Drinking Water Intake (#14). The South Central RWD intake (#5), which serves the population of Kidder, McIntosh, and most of Emmons and Logan counties, is about 11 miles downstream of the Lake Oahe crossing. Impacts on the South Central RWD intake, including taking the intake offline preventatively, would impact the local economy and potentially public health creating a community hardship that would not be immediately capable of being resolved. The SRST Drinking Water Intake (#14) is about 75 miles downstream of the Lake Oahe crossing. The SRST provided input that they rely on the Lake Oahe for all domestic, municipal, and rural water needs, and that they only maintain 4 days of water in their intake reserves. Because the SRST intake is located at depths of 60 to 80 feet and 75 miles downstream of the Lake Oahe crossing, the modeling predicts that no DHCs would be present at this depth (almost double the depth where concentrations would be present) or distance (more than 10 miles beyond the areas predicted to experience effects) and this intake would likely not be affected. Section 3.8, Socioeconomics, Environmental Justice, and Health, provides further discussion on socioeconomic, environmental justice, and health impacts related to drinking water.

For impacted agricultural water intakes, if not taken offline promptly, contaminated water may be drawn into the system. This contaminated water has the potential to affect irrigated cropland and harm livestock through application. Food production would be indirectly affected until clean water is available for irrigation use and soils are contaminant-free.

Commenters also expressed concern over the risk of a release to the drinking water provided by the Mni Wiconi Project,[32] including concern by the Oglala Sioux Tribe that the 10-day modeled simulation period for a WCD is unjustified and does not account for oil remaining in the water downstream of the

[32] Congress enacted the Mni Wiconi Project Act of 1988, Pub. L. No. 100-516, 102 Stat. 2566 (1988) to ensure a safe and adequate municipal, rural, and industrial water supply to West River/Lyman-Jones Rural Water System, the Oglala Sioux Rural Water Supply System, the Rosebud Sioux Tribe Rural Water System, and the Lower Brule Sioux Tribe Rural Water System.

discharge. The FRP Modeling Report (Appendix G) assumes that response and mitigation would occur 10 days after the release. Ten days is considered to be a very long period of time to initiate a response and therefore, represents the upper limits for worst-case scenario. The Mni Wiconi Project serves approximately 52,000 people, including the Oglala Sioux Rural Water Supply System. The Oglala Sioux Tribe has emphasized the importance of ensuring the safety of the Missouri River as the Tribe's source of clean water. Further, the Mni Wiconi Act recognizes that the United States "has a trust responsibility to ensure that adequate and safe water supplies are available to meet the economic, environmental, water supply, and public health needs of the Pine Ridge Indian Reservation."[33] The nearest Mni Wiconi Project intake is about 200 miles downstream of the Lake Oahe crossing near Pierre, South Dakota. The intake is outside the modeled impact area, and because no DHC concentrations are predicted beyond 65 miles of the release location, contaminants are not anticipated to travel downstream to the Mni Wiconi Project intake, however, intake operators would be notified of a release and have the opportunity to shut it down to prevent any potential contamination. With implementation of remediation measures, the water quality and surface water intakes would not likely be affected. The CRST public water intake (intake #15) located about 156 miles downstream of the Lake Oahe crossing would also not likely be affected because it is outside the modeled impact area where contaminants would be anticipated to travel.

Additional unmodeled release scenarios that could occur under Alternative 3 are assessed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3 (e.g., if the released oil followed the HDD profile to the former HDD site and reached the surface before flowing downhill to the lakeshore). The releases considered in the unmodeled scenarios would result in minor to moderate impacts on water intakes depending on the location, volume, and extent of the release. The duration of the impact on water intakes would range from short- to long-term depending on the remediation timeframe. However, the likelihood that water intakes would be affected is remote to unlikely due to safeguards such as monitoring and leak detection. As a result, the risk ranking would range from negligible to moderate and not result in a significant impact on water quality.

Mitigation

Dakota Access has measures in place meant to reduce response time and mitigate a release to reduce impacts on water intakes and water quality. Dakota Access would implement the measures in the FRP and GRP (Appendix F) in the event of a release. The GRP contains a comprehensive list of all known drinking and agricultural water intakes downstream of the crossing. The notification procedures in place require any release that could enter the Missouri River/Lake Oahe to be reported to North Dakota Department of Environmental Health and Department of Emergency Services, South Dakota Department of Agriculture and Natural Resources, and Sovereign Nation Tribes immediately and to the National Response Center within 1 hour of discovery, which will then notify all other federal agencies, including DOT, PHMSA, and the EPA. Dakota Access' response includes use of shut off valves at the Lake Oahe crossing and dispatch of personnel to the field. Cleanup efforts would be dependent on environmental conditions affecting the effectiveness and speed for removal of contaminants. Shoreline remediation activities would remove crude oil from becoming resuspended in the water.

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[33] Section 2(a)(4) of the Mni Wiconi Project Act of 1988, Pub. L. No. 100-516, 102 Stat. 2566 (1988).

The Oil Pollution Act of 1990 (33 USC § 2702) requires that the responsible party for a release of oil is liable for the removal costs and damages from such incident, including:

- Damages on the natural resources (e.g., drinking water supplies);
- For injury to, or economic losses resulting from destruction of property real or personal property;
- Damages for loss of subsistence use of natural resources;
- Damages equal to net losses of revenues and profits and earning capacity; and
- Costs for providing increased or additional public services during or after removal activities.

Dakota Access would be required to fulfill these duties where applicable in the event of a crude oil release. Additionally, the FRP and GRP describe the incident response planning efforts that would be initiated; the response would be specific to the incident. These responsibilities and requirements would reduce overall impacts on users of Lake Oahe; however, the mitigation would not necessarily be immediate and therefore users could be temporarily affected.

The impacts on water quality range from temporary to long-term and minor to moderate, and on water intakes would range from temporary to long-term and moderate to major. Impacts on the SRST Drinking Water Intake, Mni Wiconi Project, and CRST public water intakes would be negligible due to the depth or distances that are not reached by DHC concentrations. However, it is also important to consider the overall risk of a release to assess the significance of the release scenarios by evaluating the impact (consequence) and the likelihood of occurrence. Given that the likelihood of a WCD crude oil release is remote to very unlikely, the risk is negligible to moderate.

Under normal operating conditions, Alternative 3 would have no impacts on water quality or surface water intakes. An examination of the crude oil release scenarios indicates that operational impacts on water quality and water intakes would not be significant under Alternative 3. Although minor to major impacts would occur as a result of a crude oil release, the overall risk is negligible to moderate; therefore, impacts would not be significant.

Alternative 4

Under Alternative 4, no new construction would occur, which would result in no construction impacts on Lake Oahe.

Under normal operating conditions, Alternative 4 would not result in any impacts on surface waters. In the event of a crude oil release described under Alternative 3, impacts on Lake Oahe would occur. Dakota Access would be responsible for responding to a release in accordance with the GRP and FRP and liable under the Oil Pollution Act of 1990 for the removal costs and damages associated with a crude oil release. As discussed in Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions, several commenters suggested that Dakota Access develop an alternative plan for providing water to affected water users, including the SRST. To provide clean water quickly and efficiently to impacted water users, Alternative 4 includes the following additional easement condition:

- Dakota Access shall develop a plan for how it will aid water intake users affected by disruptions to access safe, clean water sources in the event of a crude oil release from DAPL at the Lake Oahe crossing. First, the plan shall provide procedures for supplying an alternative source of clean, safe water to any affected water intake users for agricultural applications and drinking water in the event a crude oil release should occur from DAPL at the Lake Oahe crossing until the release is cleaned up and water at the intake is clean and safe for the applicable uses. Second, if agricultural water cannot be provided to affected users due to limited resources and prioritization of drinking water, the plan shall provide details on how Dakota Access will compensate users of agricultural water. The plan shall specify procedures for establishing baseline water quality parameters and will set forth numeric criteria for response actions based on relevant standards. The plan shall specify that water supplied to affected communities will adhere to the EPA National Primary Drinking Water Regulations primary standards to protect public health by limiting the levels of contaminants in drinking water. The plan shall specify that standards for the following contaminants will target the EPA's MCLGs[34] and at a minimum will be below the EPA's set MCLs.[35] These contaminants include, but are not limited to, hydrocarbons antimony, selenium, ethylbenzene, ethylbenzene, ethylene dibromide, toluene, methyl tert-butyl ether, benzene, and xylenes. Further, the plan shall specify that Dakota Access will supply water to affected communities until regular laboratory testing shows that levels of contaminants associated with crude oil and/or petroleum-based hydrocarbons in water supplied by affected intakes are at a minimum below the EPA's set MCLs for relevant contaminants, including but not limited to hydrocarbons (e.g., GROs/DROs), antimony, selenium, ethylbenzene, toluene, benzene, and xylenes.

The SRST stated that it finds this mitigation measure insulting. The USACE understands that providing an alternative supply of clean water would not resolve all the SRST's concerns about water impacts, particularly because a pure, clean natural source of water holds importance in cultural practices. The impact from a release on water used for cultural practices is addressed in Section 3.7, Cultural Resources. This additional easement condition is appropriate in solely addressing water intakes to provide clean drinking water and water for agricultural uses in the event of a crude oil release from DAPL at the Lake Oahe crossing.

Impacts under Alternative 4 would be similar to Alternative 3. The severity of impacts would be slightly reduced from those described under Alternative 3 because additional conditions on the easement would be included to minimize the risk of a release, minimize the response time should a release occur, and provide for alternate sources of clean drinking and agricultural water (or compensation for agricultural impacts if water cannot be provided for that use). Similar to Alternative 3, the likelihood of a WCD crude oil release occurring would be remote to very unlikely and mitigated through additional response measures. Therefore, the consequences of a release on water quality and surface water intakes would be minor to major. These impacts would be temporary to short-term, persisting for the duration of cleanup and testing activities, and any release would be addressed under Dakota Access's FRP and GRP.

Under normal operating conditions, Alternative 4 would not affect water quality or surface water intakes. In the event of a WCD crude oil release, with the remote to very unlikely likelihood of a release, the overall risk of a release under Alternative 4 would be negligible to moderate. Operational impacts on surface waters associated with Alternative 4 would not be significant.

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[34] The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.
[35] The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to MCLGs as feasible using the best available treatment technology and taking cost into consideration. MCLs are enforceable standards.

Alternative 5

The North Bismarck Reroute would cross two source water protection areas and 149 mapped intermittent and perennial waterbodies (excluding ephemeral drainages). Construction activities as well as impacts from a crude oil release along the North Bismarck Reroute could impact surface water resources. It is reasonable to assume that pipeline construction would require grading, trenching, spoil storage, backfilling, and the construction or improvements of access roads in the vicinity of surface waters. Construction impacts resulting from these activities would include increased runoff and rate of in-stream sediment loading, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutants from sediments, thermal effects, modification of riparian areas, and potential introduction of chemical contaminants such as fuel and lubricants. The extent of the impact would depend on sediment loads, flow velocity, turbidity, bank composition, and sediment particle size. These factors would determine the density and extent of downstream sediment migration. The construction of the pipeline across waterbodies could also alter bottom contours, alter stream dynamics, and increase downstream erosion and sedimentation or deposition. Turbidity resulting from resuspension of sediments during pipeline installation and erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production within the water column, decreasing dissolved oxygen concentrations within affected waterbodies.

The clearing and grading of the upland areas surrounding surface waters would reduce riparian vegetation and expose soil to erosional forces. The use of heavy equipment for construction could cause compaction of near surface soils, increasing runoff into surface waters in the immediate vicinity of the work area right-of-way. Increased surface runoff could transport sediment from uplands into surface waters, resulting in increased turbidity levels and increased sedimentation rates in the receiving waterbody.

The mainline valves constructed for the North Bismarck Reroute would not likely be located within surface waters; however, if located near surface waters, the mainline valves could have similar impacts on surface waters as pipeline construction depending on the distance from the waters. State and federal water quality permit requirements, such as BMPs like silt fences or construction matting would help reduce construction-related impacts.

During operation of the North Bismarck Reroute, there is potential for a crude oil release to contaminate surface waters, impacting water quality and surface water intakes. Impacts on water quality as a result of a crude oil release would be similar to those discussed for Alternative 3 where water quality classifications would be affected until cleanup is complete. The negative impact on water quality would be temporary to long-term and minor to moderate. Depending on the extent of the release, the impact on surface water intakes, including those for drinking water and agricultural water, could be minor to major. According to information provided by the State of North Dakota Department of Water Resources, a total of 42 permits with intakes on the Missouri River have been issued by the Department of Water Resources within 50 miles downstream of the North Bismarck Reroute Missouri River crossing. There are four permits with seven points of diversion associated with drinking water, which include a total appropriation of 90,714 acre-feet. There are 38 irrigation permits with 67 points of diversion, which include a total appropriation of 11,270 acre-feet. Depending on constructed works associated with each permit, permitted points of diversion may include multiple intakes. The State of North Dakota commented that impacts from a DAPL Project release would be reduced by crossing the Missouri River downstream of

Bismarck rather than upstream of Bismarck, where the North Bismarck Reroute would cross the Missouri River. A crude oil release upstream of Bismarck could affect the drinking water supply for the state's second-largest population center. A larger population would be affected by a release from the North Bismarck Reroute compared to the current route; however, more resources would be available and in closer proximity for the response needed to provide clean drinking water to these users (e.g., municipal government services, alternative water sources, existing infrastructure, and access). Further discussion regarding impacts on communities is in Section 3.8.2.6, [Socioeconomics, Environmental Justice, and Health] Impacts and Mitigation. It can be assumed that water intakes would be affected in a similar manner to the impacts discussed under Alternative 3 and in the spill modeling.

The likelihood of a release is considered comparable to those described for Alternatives 3 with impacts on water quality ranging from temporary to long-term and minor to moderate, and on water intakes ranging from temporary to long-term and moderate to major. With a likelihood of remote to very unlikely, the resulting risk is negligible to moderate.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the currently operational DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. This segment of the existing pipeline would be abandoned in accordance with federal requirements. Impacts on surface waters would be similar to those discussed under Alternative 2 and dependent on the scope of abandonment activities.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below. The transportation of oil via trucking/rail is likely to use existing infrastructure, which could result in impacts on surface waters. As described in Section 2.4, Alternative Transportation Methods, transportation of oil by truck or rail would likely result in more frequent, lower volume crude oil releases.

Rail and trucking transportation would impact water resources if a crude oil release occurs within the proximity of a surface water. The extent and impact are dependent on the size and location of the release. While pipelines release more crude oil by volume (Green and Jackson, 2015; PHMSA, 2018), rail and trucking are responsible for a greater number of releases per gallon of crude oil shipped than pipelines (Green and Jackson, 2015; Furchtgott-Roth and Green, 2013; PHMSA, 2018). Rail and trucking present a possible short-term impact on surface waters and downstream water intakes during construction of the North Bismarck Reroute. Additional impacts associated with the transport of crude through rail or trucking methods are further discussed in Section 3.9, Transportation and Traffic.

Constructing and operating the North Bismarck Reroute, including abandoning a portion of the DAPL Project and the short-term use of trucking and rail, would have a short-term, minor impact on downstream water quality and surface water intakes. Construction and operational impacts on water quality and surface water intakes for Alternative 5 would not be significant with implementation of BMPs and mitigation measures.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The combined construction and operational activities associated with Alternatives 1 and 5 would not be significant. The combined construction and operational impacts on water quality and surface water intakes for Alternatives 5 and 2 would not be significant.

3.3.2. Groundwater

Groundwater resources include designated sole source aquifers, wellhead protection areas, and common sources of domestic water (i.e., public and private water supply wells). Half of North Dakota's population relies on groundwater for drinking water supplies. Ninety-seven percent of the state's incorporated communities rely on groundwater, either from municipal systems, rural water systems, or private wells (NDDEQ, 2018).

3.3.2.1. Project Background: Affected Environment and Impacts

Groundwater resources within the Project Area include surficial (glacial drift [Quaternary]) and bedrock aquifers. Quaternary sands and gravels of alluvial and glacial outwash deposits provide the highest yields and best quality water; however, bedrock aquifers tend to have a greater distribution and be more continuous than Quaternary aquifers.

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

The most economically important aquifers in the Project vicinity include the aquifers associated with the Cretaceous Fox Hills and Hell Creek Formations in Emmons County, and the Tertiary Fort Union Group, which includes the Cannonball and Ludlow Formations, Tongue River Formation, and Sentinel Butte Formation in Morton County, and Alluvial and glacial drift aquifers of the Quaternary Period are present in both counties (Ackerman, 1980 and Armstrong, 1978 as cited in USACE, 2016). The Pierre Formation acts as an aquitard between surficial aquifers and deeper aquifers because it is thick and relatively impermeable.

To support the HDD design, Dakota Access developed a subsurface exploration program that included the Project's geotechnical data report with seven boring logs. Dakota Access collected geotechnical soil borings along the HDD path to determine soil characteristics. In general, the subsurface conditions encountered in the boring logs consisted predominantly of medium stiff to hard clay with varying amounts of sand, overlaid by medium dense to very dense sand with varying amounts of silt, clay, and gravel.

Designated Sole Source Aquifers and Wellhead Protection Areas

The EPA defines a sole or principal source aquifer area as one that supplies greater than 50 percent of drinking water consumed in the area overlying the aquifer and where there are no alternative water sources available that would physically, legally, and economically supply the drinking water for all those who rely on it (EPA, 2017). The NDDEQ's regulatory program to protect water sources (both surface water and groundwater) is discussed in Section 3.3.1.1, Project Background: Affected Environment and Impacts. The Project Area does not overlie any designated sole source aquifers (EPA, 2021a) or wellhead protection areas (NDDEQ, 2021a). Therefore, there were no impacts on designated sole source aquifers or wellhead protection areas during construction.

Public and Private Water Supply Wells

As described in the 2016 EA, there are no public or private water supply wells located within 150 feet of the Project Area. Impacts within 150 feet of the Project Area were used for the evaluation of construction impacts on water wells and springs using the FERC guidelines. Although the Project is not under the jurisdiction of FERC, 150 feet was deemed to be an appropriate distance for this evaluation. Therefore, there were no impacts on public or private water supply wells during construction.

Contaminated Groundwater

The primary sources of groundwater contamination in the Project Area are related to agricultural activities, including the leaching of pesticides, herbicides, and fertilizers into underlying aquifers. Other possible sources of groundwater contamination include cattle feedlots, municipal landfills, septic tanks, sewage lagoons, oil wells, and leaking underground storage tanks. On-site septic systems are the primary form of wastewater treatment in rural North Dakota. However, based on a review of aerial photographs, no agricultural activities, livestock feedlots, municipal landfills, sewage lagoons, or contamination due to crude oil and natural gas development were identified within 0.25 mile of the Project Area. In addition, a review of the EPA's Facility Registry Service data (EPA, 2021b) and the NDDEQ underground storage tank data (NDDEQ, 2021c) identified no known sites of potential contamination within 500 feet of the Project Area.

During construction, the pipeline was installed in saturated sediments via the HDD crossing method under Lake Oahe. The HDD crossing method is inherently not a risk to groundwater resources and uses benign substances (e.g., bentonite and water) to maintain the bore hole through soil, rock, and groundwater. Further, no inadvertent release of drilling material was observed during the HDD construction.

The HDD workspaces include workspace to operate the HDD equipment and the pull-back section of pipeline. Excavation was completed within the HDD workspaces to tie-into the adjoining pipeline. Although drilling and dewatering activities can influence regional groundwater flow patterns, shallow aquifers were not affected because well points to dewater work areas were not required. Construction had a temporary to short-term, minor impact that was not significant on groundwater.

Release-related impacts from construction activities are typically associated with improper fuel storage, equipment refueling, and equipment maintenance. Dakota Access' SPCC Plan outlined measures to be implemented to avoid, minimize, prevent, and respond to releases of fuels and other hazardous substances during construction and included measures for cleanup, documentation, and reporting of releases. Because there were no reported contaminants introduced to groundwater from incidental releases during construction-related activities in the Project Area when the pipeline was installed, impacts were negligible and temporary.

3.3.2.2. Current Affected Environment

There have been no changes to the affected environment of groundwater resources since the 2016 EA. No releases have occurred in the Project Area.

3.3.2.3. Impacts and Mitigation

Alternative 1

Under Alternative 1, pipeline removal from beneath Lake Oahe would impact groundwater. Section 2.5.1, Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required, provides a detailed description of the construction sequence to remove the pipeline, which would include a shutdown of the pipeline. As described above, a portion of the lake would be dewatered to create a workspace for equipment. Potential impacts from soil storage, dewatering, and incidental releases of containments would persist for the duration of pipeline removal. The shoreline adjacent to Lake Oahe has a fluctuating groundwater level that interacts with levels of the lake and cofferdam workspace dewatering can lower the local water table elevations of aquifers in the Project vicinity.

The use of heavy construction equipment and the storage of excavated sediments within the 1,400-acre storage area would cause compaction of native soils, which would lower soil permeability (i.e., inhibit precipitation from soaking into the ground) and the ability for the groundwater to recharge from precipitation-related events. Shallow aquifers could sustain minor, indirect effects from changes in overland sheet flow and recharge caused by clearing and grading of the right-of-way. Unconfined aquifers and shallow groundwater areas could be vulnerable to contamination caused by inadvertent surface releases of hazardous materials used during construction. Incidental releases associated with refueling or storage of fuel, oil, or other fluids pose the greatest risk to groundwater resources. If not cleaned up, contaminated soil could continue to leach and add pollutants to groundwater long after a release has occurred. Effects associated with releases or leaks of hazardous liquids would be avoided or minimized by restricting the locations of refueling and storage and cleaning up the hazardous material in the event of a release.

Implementation of BMPs and an SPCC plan would minimize the risk of and impacts associated with an inadvertent release of hazardous material. The BMPs and an SPCC plan would identify preventive measures to reduce the likelihood of a release, such as use of secondary containment for the storage of petroleum products, routine inspections of containers and tanks for leaks, and restriction of refueling and transferring of liquids to pre-designated locations away from sensitive areas. An SPCC plan would also specify measures to contain and clean up a release should one occur.

There would be no operational impacts on groundwater, including from a shutdown of the pipeline, under Alternative 1 because the pipeline would no longer be in operation and the Project Area would be restored to pre-construction conditions.

Removal of the pipeline, under Alternative 1, would have a long-term, minor impact on groundwater that would not be significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 likely also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

No groundwater resources near the HDD workspaces have been identified. Therefore, pipeline abandonment activities under Alternative 2 are not expected to affect groundwater resources.

No operational impacts on groundwater resources, including from a shutdown of the pipeline, are expected to occur under Alternative 2 because the pipeline section would be abandoned and no longer operational.

In conclusion, Alternative 2 would have no impact on groundwater.

As described in Alternative 1, under Alternative 2, Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, are described under Alternative 5 below.

Alternative 3

Under Alternative 3, no ground-disturbing activities would occur; therefore, no impacts on groundwater resources would be expected to occur from routine operation and maintenance of the buried pipeline.

A crude oil release from the pipeline system during operations could affect groundwater. Although most components of crude oil are relatively insoluble (Neff and Anderson, 1981 as cited in USACE, 2016), 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 of oil released, soil conditions (e.g., permeability, porosity, moisture), depth to groundwater, and the speed and effectiveness of response and remediation measures. Soil types around the block valves have a moderate to high hydraulic conductivity, which could allow potential near surface releases to migrate readily through the soil profile and potentially impact groundwater.

Because oil would enter groundwater through land or the surface water interface, groundwater impacts are expected in scenarios where the release is onshore and oil travels overland, or where in-water releases reach the shore. A release beneath Lake Oahe could result in shoreline exposure where the release reaches the shore, but the contaminants would primarily remain in the surface water rather than groundwater. In the event of an onshore release that results in crude oil migrating into groundwater aquifers from surface water, the groundwater and surrounding soils would become contaminated as contaminants travel along the migration path.

Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, identifies two unmodeled release scenarios with the potential to affect groundwater: a slow or rapid release of crude oil beneath Lake Oahe and traversing the HDD profile (modeled as occurring at the sediment/water interface), and a slow release onshore at the ND 380 valve (simulated as travel overland entering waterways and Lake Oahe). For the WCD modeled release scenarios, groundwater would be most susceptible to contamination from a release resulting in shoreline exposure of any threshold; therefore, the oil mass on shoreline threshold of 0.09 g/ft^2 is considered with respect to groundwater. In an unmitigated worst-case scenario, predicted thicknesses exceeding 0.09 g/ft^2 would occur intermittently, between 23 and 50 miles downstream in ice-free conditions. In ice-covered conditions, the ice edge would extend over the shoreline, meaning that no oil would be able to reach the shore. As mentioned previously, Dakota Access would be required to implement mitigation measures that would restrict the dispersal of crude oil in the event of a release. While modeled mitigated scenarios assumed different baseline conditions and are therefore not directly comparable to the unmitigated scenarios, mitigation efforts are likely to reduce the impact intensity compared to the unmitigated scenarios.

In the event of a release, Dakota Access would implement the containment and recovery methods in their 2021 FRP and GRP (Appendix F). Dakota Access would develop a groundwater remediation plan in coordination with the NDDOH and other responsible federal, state, or other governmental authorities. Depending on the remediation method, extent of crude oil release, and location of the release along the pipeline, impacts on groundwater would range from temporary, minor impacts (e.g., shallower release) to long-term, major impacts (e.g., deeper release) based on the rate of migration. In both the unmodeled and modeled scenarios, contaminants are not likely to reach aquifers, which are several hundred feet deeper than the pipeline and separated from the pipeline by an aquitard. In addition, the likelihood of a large release is minimized by the protection from the thick-walled pipe and surveillance systems designed to monitor the pipeline and detect a release and the measures in place to mitigate a release. Although the consequence of a crude oil release reaching groundwater could be major, the likelihood of it occurring is remote to unlikely due to safeguards such as monitoring and leak detection. As a result, the risk ranking would range from negligible to moderate and not result in a significant impact on groundwater.

Dakota Access would be required to promptly clean up and remediate impacted areas in the event of a crude oil release. Responsive, immediate, and repetitious mitigative measures conducted in accordance with requirements would reduce the likelihood and intensity of impacts on groundwater, minimizing the overall risk of impacts to be negligible to moderate.

Alternative 4

Similar to Alternative 3 above, there would be no construction related impacts on groundwater under Alternative 4 and no impacts on groundwater resources would be expected to occur from routine operation and maintenance of the buried pipeline.

In the event of a crude oil release, impacts on groundwater would be similar to those described under Alternative 3. Soil types around the block valves have a moderate to high hydraulic conductivity, which could allow near surface releases to migrate readily through the soil profile and potentially impact groundwater. Under Alternative 4, additional conditions to the easement would minimize the likelihood of a release, the intensity of a release, and the time to respond to a release (see Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions). The SRST commented that groundwater should be monitored, which would help ensure releases are caught in a timely manner. Alternative 4 includes the following additional easement condition:

- To confirm there is no contamination of groundwater from an undetected pipeline release at the Lake Oahe crossing, Dakota Access shall develop a groundwater monitoring plan and install and maintain a groundwater monitoring network within surficial aquifers connected to Lake Oahe to monitor for the presence of petroleum-based hydrocarbons (specifically GROs/DROs). The plan shall specify location and extent of the network based on regulatory expertise (e.g., NDDEQ). If there is any increase in hydrocarbon levels or detection of visible oil, Dakota Access shall immediately inspect the pipeline for leaks. Dakota Access shall make sampling results publicly available online, and an annual report summarizing monitoring results shall be provided to the USACE, the NDDEQ, and interested Tribes.

Because the extent of the crude oil release would be reduced and the release less likely to migrate below the currently installed pipeline, impacts on groundwater would be temporary to long-term and minor to major. With the implementation of additional prevention measures as easement conditions under Alternative 4, the consequence of a crude oil release on groundwater would be lessened but similar to Alternative 3, as groundwater would not be available for use. The remote to unlikely likelihood of a crude oil release occurring results in a negligible to moderate risk on groundwater.

In conclusion, operational impacts on groundwater associated with Alternative 4 would not be significant.

Alternative 5

Construction of the North Bismarck Reroute may require dewatering work areas, which could temporarily lower groundwater levels and increase groundwater turbidity. Aboveground construction of mainline valves would have no anticipated effect on groundwater. The North Bismarck Reroute passes through Bismarck and Mandan surface source water protection areas, but there are no groundwater source water protection areas or wellhead protection areas within 1 mile of the route (NDDEQ, 2021a), and there are no sole source aquifers in North Dakota (EPA, 2021a).

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the existing DAPL Project to correspond with the start and end points of the North Bismarck Reroute. This segment of the existing pipeline would be abandoned in accordance with federal regulatory requirements.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Excavation required to cut and cap portions of the abandoned pipeline would likely be performed in uplands areas; however, work areas would likely be dewatered after precipitation events, which could have a minor, temporary impact on groundwater by lowering groundwater levels and increasing groundwater turbidity. Use of existing infrastructure to transport via trucking and/or rail would avoid additional excavation impacts on groundwater. Although rail and/or trucking transportation could result in a crude oil release, especially in the large numbers needed to replace the DAPL Project with Optimization Project volumes, the low volume of oil is not likely to impact groundwater aquifers.

Construction and abandonment activities are not likely to significantly affect groundwater resources because most of the construction/abandonment would involve shallow, temporary, and localized excavation. Shallow aquifers could sustain minor, indirect effects from changes in overland sheet flow and recharge caused by clearing and grading of the right-of-way. Near surface soil compaction caused by heavy construction equipment reduces the ability of soils to absorb water in isolated areas. Local water table elevations could be affected by trenching and backfilling. These effects would be minor and temporary to short-term, dependent upon the length of construction activities. Upon completion of construction, restoration of the right-of-way approximately to original contours and revegetation would likely restore pre-construction overland flow and recharge patterns.

In areas where groundwater is near the surface, trench excavation may intersect the water table. Dewatering of trenches may result in temporary fluctuations in local groundwater levels. These impacts would be avoided or further minimized by use of the construction BMPs such as the use of temporary and permanent trench plugs. After installation of the pipeline and aboveground facilities, the ground surface would be restored as close as practicable to original contours, and any exposed soils would be revegetated to ensure restoration of pre-construction overland flow and recharge patterns. Therefore, these minor, direct, and indirect impacts would be temporary to short-term, dependent upon the length of construction activities.

Unconfined aquifers and shallow groundwater areas are vulnerable to contamination caused by inadvertent surface releases of hazardous materials used during construction. Incidental releases associated with refueling or storage of fuel, oil, or other fluids pose the greatest risk to groundwater resources. If not cleaned up, contaminated soil would continue to leach and could pollute groundwater long after a release has occurred. Effects associated with releases or leaks of hazardous liquids would be avoided or minimized by restricting the locations of refueling and storage facilities and cleaning up the hazardous material in the event of a release.

Under normal operating conditions, Alternative 5 would not result in impacts because operating of the pipeline would not affect groundwater. If a WCD release were to occur, impacts on groundwater would be similar to those for Alternative 3, with potential temporary to long-term, minor to major impacts with a remote to very unlikely likelihood of occurring, resulting in a risk ranking from negligible to moderate.

Impacts on groundwater from construction and operation of Alternative 5 would be temporary to long-term and minor to major. The resultant risk of operation of Alternative 5 would be negligible to moderate. In conclusion, construction and operational impacts on groundwater due to Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandonment of a segment of the existing pipeline. The combined construction and operational impacts on groundwater for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on groundwater for Alternatives 5 and 2 would not be significant.

3.3.3. Wetlands

Wetlands are defined and identified as areas saturated at or near soil surface with enough frequency to support hydrophytic vegetation under normal circumstances and are regulated under Sections 401 and 404 of the CWA by the NDDEQ and USACE, respectively.

3.3.3.1. Project Background: Affected Environment and Impacts

As described in the 2016 EA, wetland data was derived from desktop analyses and verified via field delineations for the Project Area. Delineations were completed using the 1987 USACE Wetland Delineation Manual and the 2010 Regional Supplement to the USACE Wetland Delineation Manual: Great Plains Region methodology (USACE, 1987; USACE, 2012). No wetlands were identified within the Project Area. Therefore, there was no impact on wetlands during initial construction of the pipeline.

3.3.3.2. Current Affected Environment

There have been no changes to the affected environment of wetland resources since the 2016 EA.

3.3.3.3. Impacts and Mitigation

Alternative 1

Under Alternative 1, pipeline removal from beneath Lake Oahe could impact wetlands. Section 2.5.1, Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required, provides a detailed description of the construction sequence to remove the pipeline. Prior to removal, the pipeline would be shut down. Equipment excavating within Lake Oahe would require about 1,400 acres to store excavated material onshore. The spoil storage locations could impact National Wetlands Inventory (NWI) mapped wetlands, which are approximately 4.2 acres in size, and a mapped pond approximately 0.6 acre in size (USFWS, 2021), which occur outside of the existing Project Area. Although access roads between the excavation and the storage areas have not been identified, additional wetlands could be impacted by access road crossings. Avoiding placing spoil in the wetlands and pond and using common BMPs to protect those sensitive features would minimize impacts. Based on the analysis above, Alternative 1 would have a long-term and minor impact on wetlands.

There would be no operational impacts on wetlands under Alternative 1 because the pipeline segment would no longer be in operation and the Project Area would be restored to pre-construction conditions.

In conclusion, construction activities associated with Alternative 1 would not result in significant impacts on wetlands.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also likely include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Because there are no wetlands near the HDD workspaces, Alternative 2 would have no impacts on wetlands from ground-disturbing activities. There would be no operational impacts on wetlands under Alternative 2 because the pipeline segment would be abandoned and no longer operational, and abandonment activities would be conducted in areas away from existing wetlands.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined likely impacts of Alternatives 2 and 5 are described under Alternative 5 below.

Alternative 3

Under Alternative 3, no ground-disturbing activities would occur, therefore, there would be no construction related impacts on wetlands.

Impacts during operations include the risk of a crude oil release from the existing pipeline. Oil mass concentrations exceeding 0.09 g/ft^2 may affect wetlands adjacent to the shorelines of Lake Oahe. Modeling of unmitigated worst-case scenarios estimated shoreline oiling at a thickness exceeding 0.09 g/ft^2 would occur intermittently, over a range of 23 to 50 miles downstream in ice-free conditions. In ice-covered conditions, the ice edge would extend over the shoreline, meaning that no oil would be able to reach nearshore wetlands. As mentioned previously, Dakota Access would be required to implement mitigation measures that would restrict the dispersal of crude oil in the event of a release. While modeled mitigated scenarios assumed different baseline conditions and are therefore not directly comparable to the unmitigated scenarios, mitigation efforts are likely to reduce the impact intensity compared to the unmitigated scenarios.

Within the modeled distances, the NWI mapping shows 268 wetlands (approximately 2,507 acres) that are adjacent to the shoreline and located upstream or downstream from the existing Project Area (USFWS, 2022). While wetlands would not be permanently lost due to a crude oil release, the ecological function (e.g., wildlife support and water quality processes) of any wetlands contaminated with petroleum or petroleum constituents would likely be diminished until full remediation and restoration is successful. These functions could take greater than 5 years to restore through remediation measures and natural recovery (Katsumiti et al., 2013). If oil cleanup and other mitigative measures are responsive, immediate, and repetitious in accordance with requirements, the consequence of a WCD crude oil release entering wetlands would be long-term and moderate, the likelihood of it occurring is remote to very unlikely, resulting in a negligible to minor risk on wetlands.

Additional unmodeled release scenarios assessed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, could affect wetlands (e.g., if the released oil followed a path of least resistance into a wetland near Lake Oahe) depending on the size and duration of the release. These scenarios would result in minor to moderate impacts on wetlands depending on the location, volume, and extent of the release. The duration of the impact on wetlands would range from short- to long-term depending on the release volume. However, the likelihood of a release is remote to unlikely with the safeguards such as monitoring and leak detection in place. As a result, the risk ranking would range from negligible to moderate and not result in a significant impact on wetlands.

In conclusion, operation activities associated with the implementation of Alternative 3 would not result in significant impacts on wetlands.

Alternative 4

Under Alternative 4, no ground-disturbing activities would occur; therefore, no impacts associated with ground-disturbing activities would occur on wetlands.

In the event of a crude oil release, impacts on wetlands would be similar to those described under Alternative 3. The additional conditions proposed under Alternative 4 would reduce the likelihood of a release, the intensity of the release, and the time required to respond to a release. Similar to Alternative 3, the likelihood of a crude oil release occurring would be remote to unlikely, resulting in a negligible to moderate risk on wetlands.

In conclusion, operational impacts on wetlands associated with Alternative 4 would not be significant.

Alternative 5

The North Bismarck Reroute centerline would cross 77 NWI mapped wetlands (74 palustrine emergent, 1 scrub-shrub/forested, and 2 freshwater pond), totaling about 21 acres. With a construction right-of-way width between 75 and 100 feet, approximately 0.10 acres of palustrine shrub-scrub/forested, 12.07 acres of palustrine emergent, and 0.77 acres of freshwater pond wetland types would be temporarily impacted. With a permanent easement width of 50 feet, approximately 0.09 acres of palustrine scrub-shrub/forested, 7.50 acres of palustrine emergent, and 0.60 acres of freshwater pond wetlands would be permanently impacted. Under this alternative, impacts on wetlands would occur from construction of mainline valves and in the event of a crude oil release during operations.

It is reasonable to assume that pipeline construction would require access roads and trenching across wetlands, which would temporarily limit wetland functions (e.g., wildlife support and water quality processes) during construction. If temporary removal of wetland vegetation occurs during construction, it would alter the capacity of wetlands to function as habitat and flood and erosion control buffers. If soils are not segregated, mixing topsoil with subsoil would alter nutrient availability and soil chemistry, thereby inhibiting recruitment of native wetland vegetation. Heavy equipment operating during construction could result in soil compaction or rutting that would alter natural hydrologic and soil conditions, reducing the likelihood of native seed germination and establishment of healthy root systems. Additionally, discharges from stormwater, dewatering structures, or hydrostatic testing could transport sediments and pollutants into wetlands, affecting water quality. However, state and federal permit conditions, including BMPs such as segregating wetland topsoil and returning pre-construction contours would allow wetland functions to be fully restored. In many cases, palustrine emergent wetlands are fully revegetated within one to three growing seasons. Shrub-scrub and forested wetlands would be revegetated and maintained to shrub-scrub vegetation.

The majority of the effects on wetlands from construction of the pipelines would be temporary to short-term because wetlands would be restored. Dakota Access would mitigate for unavoidable wetland impacts by implementing the procedures specified in its ECP prepared for the North Bismarck Reroute and complying with permit conditions. Compensatory mitigation may also be required to offset certain impacts on functions and values of affected wetlands, which would be determined by regulatory requirements during permitting of the reroute.

A crude oil release in wetlands during operation of the North Bismarck Reroute would affect wetland functions until remediation is complete. Depending on the extent of the release and timing to implement mitigative measures, temporary to long-term and minor to moderate impacts on wetlands are anticipated under Alternative 5. Similar to Alternatives 3 and 4, the likelihood of a release is remote to very unlikely with safeguards such as monitoring and leak detection in place. As a result, the risk ranking would range from negligible to minor.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. The USACE assumes that the abandoned pipeline would be left in place; however, sections would be excavated, cut, filled, and capped. These excavations would likely be performed in uplands areas to avoid impacts on wetlands.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail. The transportation of oil via trucking/rail would use existing infrastructure, which would avoid excavation impacts on wetlands. Rail and/or trucking transportation—especially in the large numbers needed to replace the DAPL Project—has the potential to affect wetlands from a crude oil release. As described in Section 2.4, Alternative Transportation Methods, transportation of oil by truck or rail would likely result in more frequent, lower volume crude oil releases.

An examination of impacts related to construction and operation of the North Bismarck Reroute, including abandoning a portion of the DAPL Project and the short-term use of rail and trucking, indicates Alternative 5 would have temporary to long-term, minor to moderate impacts on wetlands.

In conclusion, construction and operational impacts on wetlands for Alternative 5 would not be significant with implementation of BMPs and measures outlined in the ECP for a reroute.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Based on the assessments above, the combined construction and operational impacts on wetlands for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on wetlands for Alternatives 5 and 2 would also not be significant.

3.3.4. Floodplains

Floodplains are the low-lying ground adjacent to rivers and streams formed by sediment over time by flooding. Floodplains reduce flooding and flood-related damages by providing natural floodwater storage and conveyance during flood events, reducing velocities and flood peaks, and curbing sedimentation. Floodplains also perform crucial ecological functions such as filtering sediment and contaminants, providing groundwater recharge, nutrient transport, and supporting vegetation and wildlife habitat. As defined by FEMA's National Flood Insurance Program, floodplains refer to the 100-year floodplain, which is an area inundated by the 1 percent chance of an annual flood event. Federal agencies are subject to EO 11988 (Floodplain Management), which requires avoidance of direct or indirect support of development within 100-year floodplains whenever there is a practicable alternative. This is implemented by the USACE Omaha District Flood Risk and Floodplain Management Section.

3.3.4.1. Project Background: Affected Environment and Impacts

The east side of Lake Oahe (Emmons County) and west side of Lake Oahe (Morton County) is categorized by FEMA as Zone D (FEMA, 1987 and 2005), which means there are areas with possible flood hazards, but a detailed analysis has not been conducted (FEMA, 2019). Review of the State of North Dakota Department of Waters' Risk Assessment Map Service, a non-regulatory flood risk data service, indicates that the 500-year flood risk on the west side of the lake extends into adjacent drainage areas that cross the Project workspace, and approximately 400 feet of the Project workspace on the east side (NDRAM, 2023).

The USACE Omaha District reviewed the Project Area and determined that restoring original elevations, topography, and excess material removed after construction, there would be no flood risk or floodplain management concerns with the Project and verified compliance of EO 11988. Therefore, there was no impact on floodplains during construction.

3.3.4.2. Current Affected Environment

There have been no changes to the affected environment of floodplain resources since the 2016 EA.

3.3.4.3. Impacts and Mitigation

Alternative 1

Under Alternative 1, pipeline removal from beneath Lake Oahe could impact floodplains. Section 2.5.1, Alternative 1: Easement is Not Granted and Restoration to Pre-Pipeline Conditions Required, provides a detailed description of the construction sequence of pipe removal. The pipeline would be temporarily shut down prior to removal. Excavation within Lake Oahe would require about 1,400 acres to store excavated material onshore. Both sides of Lake Oahe are labeled as Zone D, which means areas of possible flood hazards. It is reasonable to assume that there are floodplains on both sides of Lake Oahe that could be impacted by the spoil storage area and access roads. Floodplains crossed by the pipeline would be temporarily affected by ground-disturbing activities and spoil piles. Creation of the cofferdams would temporarily increase the flood retention capacity, but this would be offset by an equal reduction of flood retention capacity associated with the spoil piles, thus the overall flood retention capacity would be unchanged. However, the presence of the spoil piles would temporarily alter surface drainage, redirecting flows within the floodplain area.

There would be no operational impacts on floodplains under Alternative 1 because the pipeline segment would no longer be in operation and the Project Area would be restored to pre-construction conditions.

In conclusion, impacts on floodplains would be limited to construction of access roads and temporary spoil storage areas. Alternative 1 would have a long-term and minor impact on floodplains that is not significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also likely include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

There are no confirmed floodplains near the HDD workspaces, although areas with possible flood hazards are present on both sides of Lake Oahe. Alternative 2 would have no permanent construction impacts on floodplains. Temporary impacts would involve minor ground disturbance during pipeline abandonment that would not be expected to affect floodplain function.

There would be no operational impacts on floodplains under Alternative 2 because the pipeline segment would remain buried and be abandoned (i.e., purged and sealed) and no longer operational.

In conclusion, pipeline abandonment activities associated with Alternative 2 would have a temporary, negligible impact on floodplains that is not significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the likely combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternative 3

Under Alternative 3, no new construction would occur, which would result in no construction impacts on floodplains.

Floodplains would not be affected by the operation of the buried pipeline. Seasonal and flash flooding hazards are a concern where the pipeline would cross or be near major waterbodies and small watersheds. Although flooding itself does not generally present a risk to pipeline facilities, bank erosion and/or scour could expose the pipeline or cause sections of pipe to become unsupported. Federal regulations require installing the pipeline at a sufficient depth to avoid possible scour at waterbody crossings. The pipeline is buried approximately 95 to 126 feet below the bottom of Lake Oahe. Operational impacts are not anticipated under Alternative 3 due to burial depth of the pipeline.

Impacts during operations would include those associated with a crude oil release in Lake Oahe that could migrate downstream to nearshore floodplains. The effect metric that is the most relevant to impacts on nearshore floodplains along Lake Oahe is the farthest distance where oil mass on shoreline could exceed 0.09 g/ft^2. The spill modeling predicts a maximum shoreline exposure of 23 to 50 miles downstream. Based on available FEMA floodplain mapping, the land portion of the mapped 100-year floodplain is 875 acres within the 23 to 50 miles downstream of the pipeline (FEMA, n.d.). As mentioned previously, Dakota Access would be required to implement mitigation measures that would restrict the dispersal of crude oil in the event of a release, as such. While modeled mitigated scenarios assumed different baseline conditions and are therefore not directly comparable to the unmitigated scenarios, mitigation efforts are likely to reduce the impact intensity compared to the unmitigated scenarios.

Exposure to crude oil would not prevent floodplains from storing water. A greater discussion of habitat functions occurring in floodplains (i.e., vegetation and wildlife) is presented in Section 3.5, Wildlife and Aquatic Resources. Because floodplains would continue to store floodwater, the consequence of a crude oil release entering floodplains would be negligible, and the likelihood of a WCD release occurring is remote to very unlikely. In the event of a release, floodplain storage could be affected during cleanup if soil excavation or vegetation removal is required; however, floodplain functions would return once restoration is complete. Therefore, the risk on floodplains is negligible and temporary to short-term.

In conclusion, Alternative 3 would not result in a significant impact on floodplains.

Alternative 4

Under Alternative 4, no new construction would occur, and no construction related impacts on floodplains would occur.

In the event of a crude oil release, impacts on floodplains would be similar to those described under Alternative 3. Impacts under Alternative 4 would be similar but less intensive than Alternative 3 because additional conditions on the easement would be included to minimize the potential for a release and the response time should a release occur. Similar to Alternative 3, the likelihood of a WCD crude oil release occurring would be remote to very unlikely, resulting in a negligible risk on floodplains. Therefore, Alternative 4 would not result in a significant impact on floodplains.

Alternative 5

The North Bismarck Reroute would likely impact floodplains along the waterbodies described in Section 3.3.1.3, Impacts and Mitigation. Pipeline and mainline valve construction in floodplains would have a temporary impact reducing storage capacity, which would be fully restored by returning pre-construction contours. Both construction activities and operational impacts from an inadvertent release from the North Bismarck Reroute would potentially impact floodplains.

Floodplains crossed by the pipeline would be temporarily affected by spoil piles. Increased flood retention capacity from trenching would be offset by the reduced retention capacity associated with spoil piles, thus the overall flood retention capacity would be unchanged. However, the presence of the spoil piles would temporarily alter surface drainage and could redirect flows within the floodplain area. Floodplains would not be affected by the operation of the buried pipeline. Seasonal and flash flooding hazards are a concern where the pipeline would cross or be near major waterbodies and small watersheds.

A crude oil release during operation of Alternative 5 would have negligible and temporary to short-term impacts on floodplains. In the event of a release, floodplain storage could be affected during cleanup if soil excavation or vegetation removal is required; however, floodplain functions would return once restoration is complete. The likelihood of a release occurring is remote to very unlikely; therefore, the risk on floodplains is negligible. In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. The abandoned pipeline would be left in place; however, intervals would be excavated, cut, and capped. Although these excavations may temporarily disturb floodplains during construction, they would be fully restored to allow flood retention resulting in negligible impacts.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail. Transportation of the additional volume of oil via trucking and/or rail would use existing infrastructure, which would avoid new impacts on floodplains. As described in Section 2.4, Alternative Transportation Methods, transportation of oil by truck or rail would likely result in more frequent, lower volume crude oil releases; however, an oil release from truck or rail would not impact the function of the floodplain.

In conclusion, construction and operational impacts on floodplains for Alternative 5 would have a temporary to short-term, negligible to minor impact on floodplains that would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Based on the assessments above, the combined construction and operational impacts on floodplains for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on floodplains resources for Alternatives 5 and 2 would also not be significant.

3.3.5. Levees

Federally funded levees are protected under Section 408, which was previously described in Chapter 1, Introduction and Background. Section 408 requires that any use or alteration, including placement of utilities or pipelines in the vicinity of a Civil Works project, is approved by the USACE. Section 408 review ensures that Civil Works projects are protected and that alterations will not negatively affect the structure or public.

3.3.5.1. Project Background: Affected Environment and Impacts

As described in the 2016 EA, review of the USACE National Levee Database and FEMA Flood Insurance Rate Maps determined that there were no levees located within 10 miles of the Lake Oahe crossing. Therefore, there was no impact on levees during construction.

3.3.5.2. Current Affected Environment

There have been no changes to the affected environment of levees since the 2016 EA.

3.3.5.3. *Impacts and Mitigation*

Alternatives 1 and 2

There would be no impacts during construction or operation on levees under Alternatives 1 or 2 because there are no levees located within 10 miles of the Lake Oahe crossing.

If Alternative 1 or 2 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 or 2 also likely include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternatives 3 and 4

Under Alternatives 3 and 4, no new construction would occur, which would result in no construction impacts on levees, as there are no levees located within 10 miles of the Lake Oahe crossing.

Impacts during operations would be limited to those associated with a crude oil release, which would not impact the function of a levee. Therefore, none of the oil release scenarios would pose a risk or significant impact on levees under Alternatives 3 or 4.

Alternative 5

The North Bismarck Reroute Alternative would not cross any levees, thereby avoiding construction or operational impacts on levees.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below. Because these activities would not likely cross or impact any levees, construction and operational impacts are not anticipated.

In conclusion, construction and operational impacts on levees for Alternative 5 would be avoided.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because none of the alternatives would have impacts on levees, there would be no combined construction and operational impacts on levees from Alternatives 5 and 1 or Alternatives 5 and 2.

3.4. Vegetation and Noxious Weeds

This section addresses the resources and impacts on vegetation, noxious weeds, and threatened and endangered plants. The past affected environment is described in the Project Background (Section 3.4.1.1). Subsequent sections address the current affected environment and associated impacts and mitigation, respectively. The geographic scope for the vegetation resources assessment consists of all areas of temporary and permanent surface disturbance within the Project Area (see Figure 1-1 in Chapter 1, Introduction and Background), as well as the broader “potentially affected area,” defined as the area directly adjacent to the Lake Oahe shoreline for up to 50 miles downstream of the Project Area at the Lake Oahe crossing. This distance of 50 miles corresponds to the modeled maximum downstream distance of shoreline exposure that could exceed ecological impact thresholds in the event of a crude oil release, based on the WCD release scenario modeling described in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Modeled Release Scenarios.

3.4.1. Vegetation

3.4.1.1. Project Background: Affected Environment and Impacts

This section describes the conditions that existed in the Project Area, and the potentially affected area, prior to and as of the completion of Project construction.

Information on vegetation was informed by three sources:

- The EPA Level IV ecoregions (Bailey, 1994) provides a broad overview of the landscape-level vegetation;
- The 2011 USGS National Land Cover Database (NLCD) (Multi-Resolution Land Characteristics Consortium, 2011) provides vegetation mapping and classification derived from remote sensing data. This NLCD mapping provides a broad overview of the potential vegetation types within the Project Area; and
- The 2021 SRST Natural Resource Baseline Information study (baseline study; SRST, 2021) prepared by the SRST Game and Fish Department, provides field-based species composition data for the Missouri-Cannonball River confluence area located just south of the Lake Oahe crossing. This data was not collected directly within the Project Area but was used to inform the species composition of the potentially affected area.

The potentially affected area spans two EPA Level IV ecoregions: the Missouri Plateau Ecoregion located on the west side of Lake Oahe and the River Breaks Ecoregion located on the east side of the lake.

Table 3.4.1-1 presents the NLCD vegetation types mapped in the Project Area both pre- and post-pipeline construction. Prior to construction, the 1.2 acres of vegetation in the federal lands permanent right-of-way was classified by NLCD as primarily grassland/herbaceous vegetation as well as cultivated crops and emergent herbaceous wetland vegetation[36] (Table 3.4.1-1). The remaining 16.6 acres of vegetation within the Project Area was classified as primarily grassland/herbaceous, with 0.2 acre within a drainage swale classified as woody wetland.[37]

Construction of the pipeline did not impact any vegetation in the federal lands right-of-way, thus the 1.2 acres of primarily grassland/herbaceous vegetation remained after pipeline construction. In contrast, the 16.6 acres of vegetation within the remainder of the Project Area was cleared and graded to bare soil during construction of the pipeline, with no vegetation remaining. Impacts on vegetation from Project construction were short-term (until revegetation was complete, as discussed in Section 3.4.1.2, [Vegetation] Current Affected Environment), localized, and considered to have been minor to moderate given the perceptible change in the resource character or value.

Vegetation has not been impacted by Project operations as there have been no releases of crude oil or further vegetation clearing for pipeline maintenance. A new road was constructed within the Project Area, but this was not associated with Project operations (see Section 3.4.1.2, [Vegetation] Current Affected Environment).

Table 3.4.1-1: Pre-2017 NLCD Vegetation Types within the Project Area

Land Cover	HDD Entry/Exit Sites and Pull-back Construction Workspace (acres)	Permanent Right-of-Way Outside Federal Lands (acres)	Federal Lands Permanent Right-of-Way (acres)
Cultivated Crops	0	0	0.1
Emergent Herbaceous Wetlands [a]	0	0	0.4
Woody Wetlands [a]	0.2	0	0
Grassland/ Herbaceous	15.3	1.1	0.6
Total Acres Pre-Construction	**15.5**	**1.1**	**1.2**
Total Acres Post-Construction	**0**	**0**	**1.2**

Source: Multi-Resolution Land Characteristics Consortium, 2011

HDD = horizontal directional drill; NLCD = National Land Cover Database; USACE = U.S. Army Corps of Engineers
[a] While the NLCD maps these areas as a wetland vegetation type, the wetland delineation did not document any wetlands (per USACE protocol) in the Project Area. The aerial image indicates that the "emergent herbaceous wetlands" are possibly "grassland/herbaceous," and the "woody wetlands" are possibly "deciduous forest" or "scrub/shrub" (Multi-Resolution Land Characteristics Consortium, 2011).

While the NLCD presents a broad view of vegetation types mapped within the Project Area, the 2021 SRST baseline study (see the species list in Tables 7 and 8 of the baseline study [SRST, 2021]) presents species composition documented as part of the vegetation inventories conducted by SRST within portions

[36] During the field delineation conducted for the 2016 EA, the emergent wetland vegetation mapped by the NLCD along the east shore of Lake Oahe was not determined to be a wetland per the USACE protocol (see Section 5.5, Water Resources, of the 2016 EA), rather this vegetation type is likely grassland/herbaceous.

[37] As described for the emergent wetland vegetation in the federal lands permanent right-of-way, the field delineation conducted for the 2016 EA did not document this as a wetland per USACE protocol. Based on the aerial imagery, this area was likely deciduous woody or scrub/shrub vegetation.

of the potentially affected area. The SRST Game and Fish Department conducted two plant surveys: 1) in 2017, in what is referred to in the 2021 baseline study as the "Missouri River High Consequence Area," which this EIS assumes to be the PHMSA High Consequence Area located on the SRST Reservation, and 2) in 2021, in the area surrounding the confluence of the Missouri and Cannonball rivers. These species lists provide baseline information on species present in the potentially affected area. The 2017 and 2021 surveys documented 73 and 71 species respectively, most of which were native species (69 to 77 percent).

The SRST baseline study did not present relative cover of species. However, of the species documented, for the purpose of this EIS, dominant species were inferred based on the ecoregions where the Project Area is located, and uncited information on common species presented in the baseline study. Dominant terrestrial species likely include grasses such as needleandthread (*Hesperostipa comata*), little bluestem (*Schizachyrium scoparium*), Junegrass (*Koeleria macrantha*), Kentucky bluegrass (*Poa pratensis*), and the invasive reed grass (*Phragmites* spp.) and reed canarygrass (*Phalaris arundinacea*). Dominant shrubs likely include juniper (*Juniperus* spp.), willow (*Salix* spp.), big sagebrush (*Artemisia tridentata*), and skunkbush sumac (*Rhus trilobata*). Various species of the submergent macrophyte pondweed (*Potamogeton* spp.) and emergent species such as smartweed (*Persicaria pennsylvanicum* and *P. lapathifolium*) and dock (*Rumex crispus* and *R. altissimus*) were also documented in the littoral and shoreline areas of Lake Oahe during the 2017 and 2021 baseline studies.

Culturally significant plants are essential to many aspects of life for tribal members, including medicine, ceremonial practices, worship, tools, and traditional diets. The Missouri River basin, including now-flooded lowlands and vistas, were historically plentiful with plant species important to tribal way of life. Inundation caused by the Pick Sloan dams had a severe effect on these plant species. Today, many species struggle to survive in this changed environment. Tribes have identified hundreds of plant species that are culturally significant, and with tribal effort the list is likely to continue to grow (Black Elk and Flying By, 1998).

SRST conducted a study that identified seven culturally significant plants present within the cultural resources APE (see Section 3.7, Cultural Resources): little bluestem (*Schizachyrium scoparium*), juniper (*Juniperus* spp.), willows (Salix spp.), big sagebrush (*Artemisia tridentata*), skunkbrush sumac (*Rhus trilobata*), curly dock (*Rumex crispus*), and water dock (*Rumex latissimus*).

3.4.1.2. Current Affected Environment

This section describes the current, post-pipeline construction condition of vegetation in the Project Area and in the potentially affected area. The current conditions account for any further impacts or mitigation that may have changed vegetation conditions since the completion of pipeline construction, to date, and provide a baseline against which to assess the impacts of each Alternative.

For the federal lands permanent right-of-way, current terrestrial and aquatic vegetation conditions are the same as described in the 2016 EA and in Table 3.4.1-1 because there was no surface disturbance on the federal lands, including the bed of Lake Oahe, during pipeline construction.

After pipeline construction, an approximately 1-mile section of access road (approximately 2 acres) was built within the construction workspace on the west side of Lake Oahe. This road appears to have been constructed in 2018 (based on the aerial imagery). The road was not constructed as part of the HDD crossing analyzed in the 2016 EA and is not part of the alternatives analysis, but it is described here because it is part of the current conditions within the Project Area. The remaining approximately 14.4 acres of temporarily disturbed vegetation within the Project Area were re-seeded in spring 2017 after pipeline construction. Revegetation methods were implemented as described in the 2016 EA which included using a native seed mix with the goal of revegetating the existing grassland/herbaceous vegetation to a minimum of 70 percent cover. Revegetation seeding and methods may have been modified based on landowner specific needs. The small section of woody vegetation was crossed by the new access road; therefore, no woody vegetation was revegetated.

Dakota Access conducted periodic inspections of the seeded areas in 2017 and 2018 to assess the status of revegetation; based on these inspections, certain areas were re-seeded or treated with herbicides to remove weeds or invasive plants (see Section 3.4.2, Noxious Weeds). Dakota Access stated that the goal of 70 percent vegetation cover was achieved in 2018, thus revegetation is considered complete in all areas of temporary disturbance.

3.4.1.3. Impacts and Mitigation

This section describes the impacts as a result of future construction and operational activities proposed under Alternatives 1 through 5 after considering proposed mitigation measures. For vegetation, an impact is any activity that results in the removal or degradation of vegetation, including clearing, grading, excavation, or crude oil releases. Intensity and duration of impacts were estimated after incorporation of any proposed mitigation measures, such as revegetation or other BMPs.

Alternative 1

Alternative 1 proposes to vacate the easement and remove the pipe from the HDD crossing under Lake Oahe. Removing the pipe would require excavation to between 4 and 126 feet onshore and approximately 95 to 126 feet beneath Lake Oahe to reach the pipe. Pipeline removal would involve a high level of water and soil disturbance for an estimated 6 to 20 or more years.

Construction to remove the pipe would require the excavation of an estimated 77 acres, which would impact terrestrial vegetation adjacent to Lake Oahe, as well as aquatic submergent and emergent vegetation within the lake and along the shoreline. Storage of the excavation spoils would require an additional estimated 1,400 acres, which would impact vegetation at the storage location. After removing the pipe, soil would be replaced and the cultivated crops and grassland/herbaceous vegetation would be revegetated.

In addition to the direct impacts on aquatic vegetation during construction, removal of the pipe would involve the construction of cofferdams that would allow the river to continue flowing on one side of the channel while excavation takes place on the other side. This long-term alteration would result in changes in flow volume, velocity, or water levels, downstream of the crossing, which could in turn cause indirect impacts on submergent and emergent aquatic plants within Lake Oahe and along the lake shoreline (e.g., related to an increase or decrease in shoreline, littoral, or deepwater habitat).

Alternative 1 would also indirectly impact vegetation outside of the Project Area, as the timber matting that would be required during construction is estimated to use between 2,000 and 7,000 trees for mat production.

Although the duration of recovery during and after excavation and spoil storage would be considered short-term (2 to 3 years for revegetation post-construction), construction would take from 6 to 20 years or more; consequently, the total duration of impact on vegetation would be considered long-term. Therefore, the direct impacts on vegetation in the permanent right-of-way and construction workspace due to excavation and spoil storage under Alternative 1 is expected to be long-term but localized, and of moderate intensity given that impacts would be perceptible and would result in an overall change in the vegetation character.

There would be no direct impacts on vegetation from Alternative 1 from pipeline operation (e.g., releases or vehicle traffic), as the easement would be vacated and the pipeline would not cross at this location.

In conclusion, as a result of the direct and indirect effects identified above, construction activities associated with Alternative 1 would not result in significant impacts on vegetation.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment by removal of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 proposes to vacate the easement and purge the pipe but leave the pipe in place and cut and cap the pipe.

Construction of Alternative 2 would not require any clearing or grading of vegetation within the federal lands permanent right-of-way, as no surface disturbance is proposed in this area given that the HDD entrance and exit locations are placed on private land. Therefore, this alternative would not have any impacts on vegetation in the federal lands area from surface disturbance.

Alternative 2 construction would temporarily disturb vegetation at the HDD entrance and exit locations within the Project Area during purging, cutting, filling, and capping of the pipeline. Any impacts on vegetation would be expected to be superficial and not disturb roots; therefore, active revegetation would only be used if deemed necessary (e.g., in areas of disturbance that causes bare ground). The direct impacts on vegetation in the Project Area outside of federal lands under Alternative 2 are expected to be temporary and highly localized, and perceptible but with no overall change in the vegetation character, resulting in a minor impact on vegetation.

As with Alternative 1, there would be no direct impacts on vegetation from pipeline operation (e.g., releases or vehicle traffic), as the easement would be vacated and the pipe would be capped and not operational.

In conclusion, as a result of the direct and indirect effects identified above, construction activities associated with Alternative 2 would not result in significant impacts on vegetation.

Further, as described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment in-place of the existing pipeline, along with the likely combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternatives 3 and 4

Alternatives 3 and 4 propose to grant the easement with the same or additional conditions as the vacated easement, respectively. Under Alternatives 3 and 4, no additional construction or surface disturbance would be required, including maintenance of vegetation (e.g., mowing or clearing). Therefore, there would be no construction impacts on vegetation within the potentially affected area under Alternatives 3 and 4.

Under normal operating conditions, no impacts on vegetation would be expected during operations, as no new ground disturbance is proposed. However, because Alternatives 3 and 4 include full operation of the pipeline, it is possible for a crude oil release to occur during operations and impact vegetation in the potentially affected area. Therefore, if a release did occur, it would degrade vegetation or require removal of vegetation and topsoil within the release area, which would then need to be replaced and revegetated, resulting in a short- to long-term impact on the local vegetation. The likelihood, release scenarios, and modeled extent of a WCD crude oil release are described in Section 3.1.6.3, [Reliability and Safety] Impacts and Mitigation, Alternative 3] Modeled Release Scenarios, and summarized here related to impacts on vegetation.

Based on the crude oil release modeling performed, during ice-free periods, aquatic, emergent, and shoreline vegetation is at the greatest risk from a release. In an ice-covered scenario, the ice edge would extend over the shoreline, meaning that no oil would be able to reach the shore. The effect metric that presents the greatest impacts on vegetation from a release is the length of the shoreline oiled at a thickness of greater than 100 µm. The only differentiating scenario between mitigated/unmitigated is the greater risk of oil dispersion and extent from an unmitigated scenario. Mitigation provides an opportunity to contain and control oil using booms, curtains, and other containment devices to minimize impacts on shoreline, emergent, and aquatic vegetation. In an unmitigated scenario, the shoreline would be oiled at a thickness of greater than 100 µm intermittently over lengths of 0.8 to 46.3 miles. In a mitigated scenario, the shoreline would be oiled at a thickness of greater than 100 µm intermittently over lengths of 5.2 to 11.1 miles. The length of shoreline impacts would be highly variable over time.

Without mitigation and cleanup measures, a release would result in long-term damage and impacts on vegetation. Oil on vegetation can disrupt fundamental plant physiological functions like photosynthesis, quickly resulting in mortality. Without post release cleanup and remediation, residual oils in shoreline sands and soils can also create major and long-term toxicity that prohibits vegetative reestablishment making the site effectively sterile for biotic life. However, under applicable federal regulations, Dakota Access would be required to promptly clean up and remediate impacted areas in the event of a crude oil release. If oil cleanup and other mitigative measures are responsive, immediate, and repetitious in accordance with requirements, the impacts on vegetation would be reduced to minor and potentially temporary. Mitigation could include reseeding/replanting and monitoring impacted areas until they achieve vegetative stability in 3 to 5 years (short- to long-term duration).

The modeled scenarios would have a remote to very unlikely likelihood of occurring given the existing mitigation measures and the fact that an FBR from the middle of the pipe is considered extremely rare, with the likelihood of the oil coming into contact with the shoreline being even less likely. With a remote to very unlikely likelihood of occurring and minor intensity of the impact as a result of the crude oil release, the resulting risk on vegetation would be negligible and not significant.

As part of their Project *Emergency Response Action Plan* (Dakota Access, LLC., 2016), Dakota Access has installed automated valve shutoffs and will dispatch personnel to the Lake Oahe valves if communications with the valves are compromised. This response plan ensures that personnel will be in place to manually shut off the valves if the automated backup systems fail. All contaminated areas would be rehabilitated and revegetated per the ECP.

SRST stated that the plants and animals along the shoreline need to be studied to establish a baseline to know when remediation is successful in the event of a crude oil release. Adjacent unaffected areas could also be used as a baseline and would likely provide more accurate baseline data as plant communities change over time compared to data collected years prior.

Additional unmodeled release scenarios are assessed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, that could impact vegetation (e.g., if the released oil followed the HDD profile to the former HDD site and reached the surface before flowing downhill to the lakeshore). These scenarios would result in minor to moderate impacts on vegetation depending on the location, volume, and extent of the release; however, a large area of vegetation is not anticipated to be affected due to safeguards such as monitoring and leak detection (particularly because an unmodeled release that affects vegetation would be visible during routine patrolling). The duration of the impact on vegetation would range from short- to long-term depending on the restoration timeframe but could be reduced to temporary with prompt implementation of cleanup measures and revegetation. With remote to unlikely likelihoods of occurrence, the risk ranking would range from negligible to moderate and not result in a significant impact on vegetation.

Under Alternative 4, any required conditions would be expected to minimize impacts on vegetation further than would be required under Alternative 3 (e.g., improved release response times and earlier detection of a release).

No additional impacts on vegetation are expected during operations.

In conclusion, as a result of the effects identified above, operation activities (including the risk of a crude oil release) associated with Alternatives 3 and 4 would not result in significant impacts on vegetation.

Alternative 5

The North Bismarck Reroute would require construction of approximately 111 miles of new pipeline, which would entail an estimated 1,200 acres of new short-term construction impacts and 700 acres of new permanent right-of-way impacts. Construction would occur in nearly identical land use types as the existing right-of-way (primarily agriculture and grass/pasture), with 24 more miles of NWI-mapped wetland vegetation crossed by the reroute right-of-way (see Table 2-1 in the 2016 EA). Construction of the North Bismarck Reroute would be expected to cause a short-term, moderate intensity impact on vegetation. In addition, the 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of permanent impacts totaling approximately 1.1 acres of habitat loss. Impacts would be minor given the small areas affected.

As with Alternatives 3 and 4, under normal operating conditions, no impacts on vegetation would be expected during operations, as no new ground disturbance is proposed after completion of construction. Therefore, the magnitude of impacts on vegetation are based exclusively on a potential crude oil release. The likelihood of such a release is considered comparable to those described for Alternatives 3 and 4. However, without details of depth of cover, soil types, and other site-specific factors, the extent and resulting magnitude of impact on vegetation of a release along the North Bismarck Reroute is unknown. For purposes of this analysis, the EIS assumes similar impacts would occur as discussed for Alternatives 3 and 4, with mitigated impacts on vegetation being temporary to long-term and negligible to moderate, resulting in an overall risk ranking of negligible to moderate.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment, and short-term oil transportation via truck and/or rail discussed below.

Abandonment of about 100 miles of pipeline is expected to cause short-term, barely perceptible ground disturbance for capping any line segments, as needed, with limited change in vegetation character and would therefore have an impact of minor intensity on vegetation. The short-term truck and rail transport could impact vegetation, as these transportation methods are known to result in more frequent, yet smaller, releases of oil than pipeline transport (Green and Jackson, 2015). If a release did occur, it would degrade vegetation or require removal of vegetation and topsoil within the release area, which would then need to be replaced and revegetated, resulting in a short- to long-term impact on the local vegetation. Depending on the extent of the release, the impact would be barely to indisputably perceptible on vegetation and therefore of minor to moderate intensity.

In conclusion, construction and operation impacts on vegetation for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Although there would be extensive construction impacts associated with Alternative 1, the intensity of the combined construction and operation impacts on vegetation for Alternatives 5 and 1 would still be considered moderate, and not significant. Given fewer construction impacts, the combined construction and operation impacts on vegetation for Alternatives 5 and 2 would also not be significant.

3.4.2. Noxious Weeds

This section evaluates state-listed noxious weeds (North Dakota Department of Agriculture, 2021a) and the potential for the Project to introduce or cause an increase in noxious weeds within the Project Area.

This section does not specifically address invasive or nuisance weed species that are not state-listed noxious weeds; however, the mitigation measures proposed for the Project also serve to minimize the spread and establishment of invasive weeds in general.

For noxious weeds, an impact would be created by any activity reasonably expected to cause the spread or increase in noxious weeds. Such activities include ground disturbance, such as grading, or the use of vehicles or equipment. These activities could indirectly cause the spread and subsequent establishment of noxious weeds; therefore, direct versus indirect impacts are not specified in the impact assessments below. The intensity and duration of impacts are estimated considering incorporation of any proposed mitigation measures, such as revegetation, weed management activities, and controls, or other BMPs proposed in the ECP for the Project (presented as Appendix G of the 2016 EA [USACE, 2016]).

3.4.2.1. Project Background: Affected Environment and Impacts

No information on weed occurrence or suitable habitat in the Project Area was presented in the 2016 EA. For the purpose of this analysis, it was assumed that any of the state-listed noxious weeds presented in Section 3.4.2.2, [Noxious Weeds] Current Affected Environment, could be present in or transported to the Project Area.

The ECP for the Project presents weed management measures that Dakota Access committed to implementing during pipeline construction to limit the spread of noxious weeds.

ECP Section 8.9, Weed Management, includes the following weed prevention and control measures:

- Minimize the time between final grading and temporary or permanent seeding.
- Construction equipment will be cleaned prior to arriving at the Project site.
- Prior to clearing and grading of the construction right-of-way and pending landowner permission, major infestation areas identified during surveys or Project field assessments may be treated with herbicides (per required permitting/certification and state laws).
- Alternatively, full construction right-of-way topsoil segregation may be implemented for weed control to allow equipment to work through the area after topsoil has been stripped, as long as equipment stays on the subsoil.
- Mulch will be composed of weed-free material (certified weed-free mulch may be required at sites-specific locations).

There was no disturbance in the federal lands permanent right-of-way during pipeline installation, and noxious weeds were not spread as a result of the pipeline construction. The grading and disturbance in the rest of the Project Area during construction may have allowed noxious weeds to spread or establish new infestations. The most recent weed survey of the Project Area was conducted by Dakota Access in 2018 and provides some insight into the weeds that may have been or are currently present. On the west side of Lake Oahe, the 2018 survey documented 25 percent cover of yellow star thistle (*Centaurea solstitialis*), 30 percent cover of kochia (*Kochia scoparia*), and minor amounts of leafy spurge (*Euphorbia esula*). On the east side of the lake, weeds including wormwood (*Artemisia absinthium*), leafy spurge, kochia, yellow sweet clover (*Melilotus officinalis*), and Canada thistle (*Cirsium arvense*) comprised less than 15 percent of the overall cover in the Project Area. While all of these weeds are considered invasive and undesirable, only leafy spurge, Canada thistle, and wormwood are state-listed noxious weeds.

The report of a November 2018 inspection performed by a North Dakota Public Service Commission contractor (Keitu Engineers and Consultants, Inc., 2018) also provides insight into weeds in the Project Area, stating that, "…some small areas of non-cropland [range or pasture land] appeared to have dominant undesirable species present…" However, without baseline weed occurrence data, changes in noxious weed status following pipeline construction are unknown. Dakota Access sprayed for noxious weeds within the HDD entry/exit sites and pull-back construction areas on both sides of Lake Oahe in 2017 and 2018; on the west side of Lake Oahe in 2019.

For the purpose of this EIS, it is assumed that with the implementation of the weed management measures proposed in the ECP, impacts associated with the spread of noxious weeds were primarily localized to the disturbance areas, were of short- or long-term duration (due to the difficulty and length of time that may have been required to eradicate certain species once established), and were moderate intensity. Therefore, this impact was not considered significant in regard to the spread of noxious weeds.

3.4.2.2. Current Affected Environment

The state of North Dakota Department of Agriculture lists the following 13 noxious weeds as priority for control efforts (North Dakota Department of Agriculture, 2021a). The spread of these noxious weed species is controlled and regulated under North Dakota Law (NDCC §4.1-47-02 as cited in the 2016 EA [North Dakota Department of Agriculture, 2014a]).

- Absinth wormwood (*Artemisia absinthium*)
- Canada thistle (*Cirsium arvense*)
- Dalmatian toadflax (*Linaria genistifolia*)
- Diffuse knapweed (*Centaurea diffusa*)
- Houndstongue (Cynoglossum officinale)
- Leafy spurge (*Euphorbia esula*)
- Musk thistle (*Carduus nutans*)
- Palmer amaranth (*Amaranthus palmeri*)
- Purple loosestrife (*Lythrum salicaria, Lythrum virgatum*, and all cultivars)
- Russian knapweed (*Centaurea repens*)
- Saltcedar (*Tamarisk* spp.)
- Spotted knapweed (*Centaurea maculosa*)
- Yellow toadflax (*Linaria vulgaris*)

This list includes all of the species that were listed in the 2016 EA, with the addition of two species that are on the current state list: houndstongue and Palmer amaranth. Palmer amaranth was first identified in Morton and Emmons counties in 2019 (North Dakota Department of Agriculture 2021b). Morton and Emmons counties do not list any additional county-specific noxious weeds.

After Project construction, all areas of temporary disturbance were seeded and revegetated to minimize the spread of noxious weeds. Dakota Access considers revegetation complete in these areas as they have reached the goal of a minimum of 70 percent vegetative cover (although as described above, invasive species cover is unknown). Noxious weeds are assessed annually on the right-of-way as part of ongoing operations, and noxious weeds are treated as they are identified.

3.4.2.3. Impacts and Mitigation

This section describes the impacts associated with noxious weed spread and establishment that could occur due to future construction and operational activities proposed under Alternatives 1 through 4 after considering proposed mitigation measures.

Alternative 1

Alternative 1 would cause substantial ground disturbance during excavation and spoil storage (as described above in Section 3.4.1.3, [Vegetation] Impacts and Mitigation). Although the ground disturbance would likely remove areas of existing noxious weeds, any positive effect caused by the reduction of noxious weeds would likely be negated by the introduction or spread of new weed infestations during and after construction. While disturbed areas would be re-seeded and expected to revegetate within 2 to 4 years post-construction, the long-term duration of disturbance (several years or decades) allows for 1) the spread of noxious weeds from adjacent areas or 2) increased populations if noxious weed species were already present within these areas. The construction activities associated with Alternative 1 could also introduce noxious weed seeds or propagules on vehicles, equipment, or workers' clothing.

The long-term disturbance caused by Alternative 1 during construction is expected to cause a localized, long-term, moderate impact associated with the spread of noxious weeds, with the implementation of weed management measures proposed in the ECP (summarized above and in Appendix G of the 2016 EA [USACE, 2016]). Although the geographic scope is considered "localized," once established, weeds would be reasonably expected to extend to and impact vegetation adjacent to the Project Area. The duration of impact (short-term versus long-term) would depend on the noxious weed species and the extent of establishment. It is possible that certain species could persist over a longer-term duration due to the difficulty and length of time that may be required to eradicate them once established. The impact intensity is considered moderate given that the impact would be indisputably perceptible if weeds were able to establish or spread, changing the overall vegetation character.

There would be no direct impacts associated with noxious weed spread and establishment under Alternative 1 from pipeline operations as the easement would be vacated and the pipeline would not cross at this location.

In conclusion, construction and operation impacts associated with noxious weed spread and establishment would not be considered significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment by removal of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also likely include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 construction would temporarily cause ground disturbance at the HDD entrance and exit locations and construction workspaces during purging, cutting, and capping of the pipe (e.g., crushing by equipment). The construction activities associated with Alternative 2 could also introduce noxious weed seeds or propagules on vehicles, equipment, or workers' clothing.

With the implementation of proposed measures to mitigate the spread and establishment of noxious weeds proposed in the ECP, the impact of the spread of noxious weeds during the Alternative 2 construction activities is expected to be short- or long-term, highly localized (i.e., less disturbance area than in Alternative 1), and minor.

There would be no direct impacts associated with noxious weed spread and establishment under Alternative 2 from pipeline operations.

In conclusion, construction and operation impacts associated with noxious weed spread and establishment would not be considered significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment in-place of the existing pipeline, along with the likely combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternatives 3 and 4

Alternatives 3 and 4 would not require any additional construction or ground disturbance, including maintenance of vegetation (e.g., mowing or clearing). Operations would require periodic access to the Project right-of-way, which could introduce noxious weed seeds or propagules on vehicles, equipment, or workers' clothing.

The 2016 EA states that the Dakota Access would implement the weed management measures proposed in the ECP during both construction and operations (see the 2016 EA Section 3.3.2.2, Environmental Impact and Mitigation). While the measures proposed in the ECP are primarily applicable only during construction, Dakota Access stated in a Data Request response that it will continue to spray noxious weeds "as needed" in the future.

With the implementation of proposed measures to mitigate the spread and establishment of noxious weeds, the impacts during operations under Alternatives 3 and 4 are expected to be short- or long-term, localized, and minor, and therefore not result in a significant impact associated with the spread and establishment of noxious weeds during operations.

Any release during operations would not directly impact the spread or establishment of noxious weeds. However, if vegetation were to be exposed to oil, it would require vegetation and topsoil removal as well as subsequent revegetation to rehabilitate the exposed area. It is assumed that all measures described in the ECP would be implemented to minimize weed infestation during rehabilitation, thereby minimizing the spread of weeds, and resulting impacts would not be significant.

Alternative 5

The North Bismarck Reroute would require construction of approximately 111 miles of new pipeline, which would entail an estimated 1,200 acres of new temporary construction impacts and 700 acres of new permanent right-of-way impacts. Construction could cause the introduction or spread of new weed infestations during and after construction.

Noxious weeds thrive when there is little competition from native vegetation and seasonal crops. Noxious weeds are well suited to outcompete native species. When noxious weeds establish themselves in newly disturbed areas before native or desirable plants are established, they quickly take available resources such as nutrients, sunlight, and water creating a much more challenging environment for the more desirable native species to establish. Standard pipeline construction measures include prompt reseeding of disturbed areas with native seed mixes and application of herbicides, as needed (see Section 3.4.2.1, [Noxious Weeds] Project Background: Affected Environment and Impacts, for a description of weed management practices that Dakota Access implements).

With Dakota Access weed mitigation measures, impacts would likely be short-term but barely to indisputably perceptible and, depending on the extent of any weed infestation, could change the overall character of the vegetation and habitat, resulting in a minor to moderate impact. During operations, the magnitude of impacts associated with noxious weeds would be expected to be the same as described above for Alternatives 3 and 4. In addition, the 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of permanent impacts totaling approximately 1.1 acres, with associated areas of temporary disturbance that could allow new weed infestation. Impacts would be minor given the small areas affected.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail.

Abandonment of about 100 miles of pipeline is expected to cause limited ground disturbance for capping any line segments, as needed. With the implementation of proposed measures to mitigate the spread and establishment of noxious weeds proposed in the ECP, the impacts associated with the spread of noxious weeds during the abandonment activities are expected to be short- or long-term, highly localized, and minor to moderate.

There would also be no direct or indirect impacts on noxious weed spread and establishment from the short-term truck or rail transport that would be required to offset the transport of oil since these transportation methods would use existing infrastructure. Any release during truck and rail transport would not directly impact the spread or establishment of noxious weeds. However, if vegetation were to be exposed to oil, it would require vegetation and topsoil removal as well as subsequent revegetation to rehabilitate the exposed area. It is assumed that all measures described in the ECP would be implemented to minimize weed infestation during rehabilitation, thereby minimizing the spread of weeds.

In conclusion, construction and operation impacts associated with noxious weed spread and establishment for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Although there would be extensive construction impacts associated with Alternative 1, the combined construction and operation impacts associated with noxious weed spread and establishment for Alternatives 5 and 1 would still be considered moderate and not significant. Given fewer construction impacts, the combined construction and operation impacts for Alternatives 5 and 2 would also not be significant.

3.4.3. Federally Listed, Candidate, and Proposed Plant Species

3.4.3.1. Project Background: Affected Environment and Impacts

In 2016, there was only one federally listed plant species in North Dakota: the western prairie fringed orchid (*Platanthera praeclara*). This plant species is associated with high-quality, moist, tall grass prairie. Most of the orchids in North Dakota are located in the Sheyenne National Grasslands in Ransom and Richland counties in the southeastern corner of the state. The 2016 EA also states that no suitable habitat was documented during field surveys conducted prior to the 2016 EA.

Due to the lack of occurrences or suitable habitat in the Project Area, pipeline construction did not impact the western prairie fringed orchid.

3.4.3.2. Current Affected Environment

The western prairie fringed orchid remains the only threatened or endangered plant in North Dakota, and there is no suitable habitat for this species in the Project Area. This species is also not currently listed in the USFWS Information for Planning and Consultation (IPaC) online tool (USFWS, 2023) report for the Project Area and 50 miles downstream of the Missouri River from the Project Area.

3.4.3.3. Impacts and Mitigation

None of the five alternatives would impact the western prairie fringed orchid during construction or operations; there are no documented occurrences nor suitable habitat for this species in the Project Area and 50 miles downstream of the Missouri River from the Project Area.

3.5. Wildlife and Aquatic Resources

This section provides an analysis of the affected area, impacts, and mitigation from past and future Project activities for Alternatives 1 through 5 on wildlife, aquatic resources, and federally protected species.

3.5.1. Wildlife

The wildlife section addresses recreationally and economically important wildlife and non-game wildlife species that could occur in the Project Area. Species important as subsistence resources are also discussed in this section as well as in Section 3.8.2, Environmental Justice. Federally protected wildlife species are discussed in Section 3.5.3 below.

For wildlife resources, significant impacts are defined as those permanently removing or degrading wildlife habitat on a large or regional scale or causing the loss of and/or long-term to permanently reduced productivity of local populations of economically and culturally important game species. The final intensity and duration of impacts are assessed in this EIS in consideration of proposed mitigation measures.

3.5.1.1. Project Background

The following discussion describes the affected environment at the time the 2016 EA was written and the impacts on wildlife that occurred during pipeline installation and nearly 6 years of Project operation.

2016 Affected Environment

Terrestrial wildlife resources within the Project right-of-way were reviewed to determine if species are listed under the federal ESA, the Migratory Bird Treaty Act (MBTA), or the Bald and Golden Eagle Protection Act (BGEPA). Wildlife protected under the ESA and the BGEPA is discussed in Section 3.5.3, Federally Protected Species, below. MBTA regulations are discussed below:

- Migratory Bird Treaty Act of 1918—The MBTA prohibits, among other things, activities that take, capture, kill, or attempt to take, capture, or kill any migratory bird, or any part, nest, or egg of a migratory bird (16 USC § 703). Migratory bird species protected by the MBTA occur throughout the general Project vicinity. EO 13186 (66 Fed. Reg. 11 [January 17, 2001], 3853 56) directs federal agencies to identify where unintentional take is likely to have a measurable negative effect to migratory bird populations and to avoid or minimize impacts on migratory birds through enhanced collaboration with the USFWS. While the MBTA does not explicitly contain specific compliance measures to address potential impacts on migratory birds, developers are encouraged to evaluate existing avian resources and take reasonable measures to prevent avian impacts. EO 13186 also states that emphasis should be placed on species of concern, priority habitats, and key risk factors, and that particular focus should be given to addressing population-level impacts. Dakota Access would be liable for any violations of the MBTA; penalties are established in 16 USC § 703.

The Project is located within the Central Flyway, one of four major routes relied upon by migratory birds for their spring and fall travel. Waterbodies such as Lake Oahe are utilized as stopover habitat for birds during migration and as nesting and breeding habitat for birds during the spring and summer. While the MBTA protects all native migratory bird species, some species are given priority when considering impacts on migratory birds due to concerns about their population status and are referred to as Birds of Conservation Concern (BCCs). The basic geographic unit for identifying BCCs is the Bird Conservation Region (BCR), and it is the most useful to federal agencies and others attempting to comply with the principles of the MBTA (USFWS, 2008). The Project is located within BCR 11 (Prairie Potholes) and BCR 17 (Badlands and Prairies). These two BCR contain 38 BCCs.

Due to the Project's proximity to Lake Oahe and the Missouri River, semi-aquatic wildlife species occur in the Project Area. Semi-aquatic species are animals that spend a considerable portion of their time in water as part of their normal behavior, but are also partially terrestrial. Examples of semi-aquatic species include amphibians and most reptiles (see Section 3.5.2, Aquatic Resources, below), water birds and waterfowl, and mammals such as beavers and muskrat. River otters (*Lontra canadensis*) have also been reported in the Missouri River but have not been officially identified.

Non-game wildlife species in the Project Area include birds, amphibians, and reptiles. Non-game birds include American avocet (*Recurvirostra americana*), American white pelican (*Pelecanus erythrorhynchos*), common tern (*Sterna hirundo*), great blue heron (*Ardea herodias*), and killdeer (*Charadrius vociferus*).

The Project crosses areas suitable for game species and is adjacent to areas that are currently used for hunting. Economically important species such as big game mammals, small game mammals, semi-aquatic mammals, and game birds are found within the Project Area. These are important for the economy, culture, and way of life of the nearby SRST and CRST who rely on hunting, fishing, and trapping for subsistence and income. The Tribes subsistence hunt to feed the members of the Tribes, especially those unable to hunt because of age or handicap. Subsistence hunting and harvesting of game also has cultural and religious purposes for the Tribes, as products from these hunts are used in ceremonial dances, pow-wows, and tribal art. Additionally, the Tribes sell and issue deer tags for hunting on the reservation, which provides an important source of income. Table 3.5.1-1 lists common game species that occur within and adjacent to the Project Area. Also see Section 3.5.2, Aquatic Resources, for examples of game fish important for subsistence resources and Section 3.8.2, Environmental Justice, for a complete list of subsistence resources.

Table 3.5.1-1: Common Game Species that Occur within the Project Area

Common Name	Scientific Name
Pronghorn Antelope	*Antilocapra americana*
White-tailed Deer	*Odocoileus virginianus*
Mule Deer	*Odocoileus hemionus*
Mountain Lions	*Puma concolor*
Coyote	*Canis latrans*
American Badger	*Taxidea taxus*
Red Fox	*Vulpes vulpes*
Common Raccoon	*Procyon lotor*
Bobcat	*Lynx rufus*
Fisher	*Martes pennant*
Mink	*Neovison vison*
Long-tailed weasel	*Mustela frenata*
Beaver	*Castor canadensis*
Muskrat	*Ondatra zibethicus*

Common Name	Scientific Name
Weasels	*Mustelidae* spp.
Rabbits	*Leporidae* spp.
Porcupine	*Erethizon dorsatum*
Striped Skunk	*Mephitis*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Gray Partridge	*Perdix*
Ringedneck Pheasant	*Phasianus colchicus*
Wild Turkey	*Meleagris gallopavo*
Canadian Geese	*Branta canadensis*
Mallard	*Anas platyrhynchos*
Pintail Duck	*Anas acuta*
Greater Prairie Chicken	*Tympanuchus cupido*
American Woodcock	*Scolopax minor*
Wilson's Snipe	*Gallinago delicata*
Doves	*Columba* spp.

Sources: USACE, 2016a, 2019

Impacts and Mitigation

Wildlife habitats within the approximately 1.5-mile-long pipeline workspace were not modified during construction and operations of the pipeline. Dakota Access utilized the HDD construction method to cross the federal land and Lake Oahe during construction, which avoided ground disturbance and habitat modifications. The eastern HDD site is more than 720 feet from the federal land, and the western HDD site is more than 360 feet from the federal land. Due to the nature of the HDD construction method, wildlife were temporarily disturbed by 24-hour lighting and noise between January and February of 2017. Also inherent to the HDD construction method is the potential for inadvertent returns. Construction did not result in any inadvertent returns of drilling mud during HDD construction, nor did any releases of hazardous material occur. Thus, there were no impacts from inadvertent releases caused by the Project.

While no wildlife habitats were modified within the pipeline corridor, habitats within the Project Area associated with the pull-back workspace were temporarily disturbed. The Project Area workspace impacted a total of 16.6 acres: 15.5 acres from temporary construction and 1.1 acres in the operational right-of-way. Additionally, vegetation was mowed in the riparian habitat along an ephemeral drainage where the pull-back area went through the drainage. All land cover categories impacted within the Project Area have been restored, although much of the workspace was converted to a permanent dirt road outside of federal property beyond the scope of the Project (see Chapter 4, Cumulative Impacts). Impacts on wildlife habitat located within the Project Area were direct, short-term, minor, and not significant.

Lighting and noise from HDD construction activities could also have affected wildlife in areas adjacent to the pipeline by causing behavioral changes in foraging and breeding activities or causing wildlife to avoid the area. Artificial lighting used for construction activities between sunset and sunrise may have disoriented birds as some birds use natural light sources and patterns for navigation or other critical biological behaviors. No impacts on nesting birds occurred because the Project was constructed outside of the nesting season. Juvenile and adult non-migratory species that inhabit the Project Area would have experienced lighting and noise disturbance during the winter season or avoided the area. The Project Area is subject to frequent recreational and industrial ship traffic along Lake Oahe, so wildlife in the area are likely acclimated to light and noise, further minimizing these impacts. Impacts from lighting and noise on wildlife were indirect, temporary, and minor, and thus are not considered significant.

No releases or maintenance activities took place on federal land during nearly 6 years of operation; therefore, Project operation has had no impact on wildlife to date.

3.5.1.2. Current Affected Environment

The changes to wildlife resources since the 2016 EA include two permanent roads that were built outside of federal property beyond the scope of the Project. The access road on the western side of the Project Area crosses the ephemeral drainage described in Section 3.5.2.1, [Aquatic Resources] Project Background.

The USACE received a scoping comment expressing concern that North Dakota's Species of Conservation Priority would be put in danger by the Project. Species of Conservation Priority are provided funding by the State and Tribal Wildlife Grant for conservation and are not provided protection by the state, although some federally listed species are included.

North Dakota ranks Species of Conservation Priority based on their population levels, rate of occurrence, and risk. This system does not afford these species protections but is a good framework for assessing species status in North Dakota. Species of Conservation Priority are categorized into three levels in accordance with their conservation need. Level I species either have declining populations in North Dakota or across their range and are considered to have a high level of conservation priority or are at risk range-wide and have a high rate of occurrence in North Dakota. Level II species have a moderate level of conservation priority or have a high level of conservation priority and have a substantial level of non-State and Tribal Wildlife Grant funding available. Level III species also have a moderate level of conservation priority but are believed to be peripheral or non-breeding in North Dakota (NDGF, 2019a). Level III species are not discussed further in this EIS.

There are 36 Level I species and 44 Level II species on the list of concern. Level I species that could occur in the Project Area include the Franklin's gull (*Leucophaeus pipixcan*), big brown bat (*Eptesicus fuscus*), and smooth greensnake (*Opheodrys vernalis*). Level II species that could occur in the Project Area include the American white pelican (*Pelecanus erythrorhychos*), Richardson's ground squirrel (*Urocitellus richardsonii*), and snapping turtle (*Chelydra serpentina*) (NDGF, 2019a). A survey conducted by the SRST in the summer of 2021 from the Lake Oahe crossing to 21.3 miles downstream identified seven Level I and seven Level II species. The Level I species that were identified include the big brown bat, the black-tailed prairie dog (*Cynomys ludovicianus*), the Franklin's gull, the little brown bat (*Myotis lucifugus*), the monarch butterfly (*Danaus plexippus*), the pink papershell (*potamilus ohiensis*), and the regal fritillary (*Speyeria idalia*). The Level II species that were identified include the bald eagle (*Haliaeetus leucocephalus*), the golden eagle (*Aquila chrysaetos*) (see Section 3.5.3, Federally Protected Wildlife Species, for more information), the bobolink (*Dolichonyx oryzivorus*), the least tern (*Sterna antillarum*), the sharp-tailed grouse (*Tympanuchus phasianellus*), the snapping turtle (*Chelydra serpentina*), and the western meadowlark (*Sturnella neglecta*).

3.5.1.3. Impacts and Mitigation

For Alternatives 1 through 5, the assessment for wildlife is discussed in terms of impacts and mitigation that could occur due to future construction and operational activities.

Alternative 1

Alternative 1 abandonment would require excavation to depths ranging between approximately 95 to 126 feet to remove the pipeline from under Lake Oahe. Excavating the volume of sediment necessary to reach the pipe would involve about 1,400 acres of workspace for spoil storage in terrestrial habitat adjacent to the lake. Additional habitat disturbance could also occur if the adjacent Northern Border pipelines should need to be removed or rerouted (see Chapter 2, Alternatives).

The resulting level of ground disturbance in the spoil storage area would result in the displacement of wildlife species during abandonment removal activities to nearby suitable habitat, injury or mortality of burrowing species, temporary loss of herbaceous habitat, and increased noise and lighting for 6 to 20 years or more (see Chapter 2, Alternatives). Waterbirds and waterfowl would also be displaced from the work area in Lake Oahe during excavation activities. Additionally, game species could be dispersed by lighting and noise, resulting in behavioral changes and increased competition in nearby areas. Refer to Section 3.8.2, Environmental Justice, for information on the impact on subsistence hunting. Following construction, terrestrial habitat would likely be restored within two to three seasons, and local populations of wildlife would be expected to recover within a similar timeframe. Impacts from pipeline removal would therefore be long-term and major.

In conclusion, as a result of the direct and indirect effects identified above, construction activities associated with Alternative 1 would not result in significant impacts on wildlife.

There would be no operation associated with Alternative 1, and so there would be no operational impacts, including no risk of a crude oil release from the Project.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Ground disturbance would occur at the HDD sites where Dakota Access would purge, cut, and cap the pipeline. This would occur on 0.7 acre of grassland habitat. Activities would create noise that could cause wildlife in the area to disperse to nearby suitable habitat and return once construction has completed. Ground disturbance would also directly impact any burrowing species. Although unlikely, ground disturbance could cause injury or mortality if the burrow is near the construction workspace. Herbaceous land cover would be restored, as it was after the previous ground disturbance. As a result, impacts from purging, cutting, and capping the pipeline would be direct and indirect, temporary, and negligible.

Leaving the pipe in the ground would result in no long-term impacts on wildlife. The pipeline would be flushed of all contaminants and be observed, evaluated, and remediated should any problem conditions occur from leaving the pipe in place. In addition, there would be no operation associated with Alternative 2, and so there would be no operational impacts, including no risk of a crude oil release from the Project.

In conclusion, impacts on wildlife under Alternative 2 would not be significant.

Further, as described for Alternative 1, Dakota Access would likely seek to construct and operate a pipeline reroute under Alternative 2. Direct and indirect impacts from the North Bismarck Reroute, along with the combined impacts of Alternative 2 and 5, are described under Alternative 5 below.

Alternative 3

No additional construction impacts would occur under Alternative 3 beyond those discussed in Section 3.5.1.1, [Wildlife] Project Background.

As the pipeline in the Project right-of-way is buried between approximately 95 and 126 feet below the surface, there is no chance of tree roots or other vegetation damaging the pipe over most of the Project Area, so no vegetation maintenance is needed in this area. Therefore, no changes to vegetation communities would occur during the operation of the Project, thus wildlife habitat and herbivore food sources would not be impacted.

Any inadvertent release of hydrocarbons from the pipeline during operation could impact wildlife species within and beyond the Project Area, including migratory birds, culturally and economically important game species, and wildlife habitat.

The effect metric evaluated in the crude oil release modeling that presents the greatest risk to game species and terrestrial wildlife is the EA-100, or the equivalent area where 100 percent of a particular species could be mortally affected. The EA-100 is used to quantify the mortality impact by accounting for magnitude (hydrocarbon concentration), duration, and area of exposure in a single metric. Computation of this metric is described in detail in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3. Modeling indicates that the EA-100 for potential acute effects on wildlife assuming average sensitivity of species is less than 0.04 mi^2 during both mitigated and unmitigated ice-free conditions. In an ice-covered scenario, the ice edge would extend over the shoreline, preventing oil from reaching the shore and affecting terrestrial wildlife species. The modeled impacts for both mitigated and unmitigated scenarios are highly variable across these distances and over different timeframes.

Any species that spend time in aquatic and shoreline habitats are at risk in the event of an oil release. Impacts under both the mitigated and unmitigated scenarios could include oiling of wildlife species, oiling of shoreline vegetation, and any associated acute and/or chronic health effects from inhalation or ingestion (EPA, 1999). Modeling indicates that the potential for an organism to be present at the time of thickest oil exposure is very low. This is due to the nature of Bakken crude as a light oil that spreads quickly. Rapid transport of surface floating oil makes it unlikely that exposure durations above the threshold for acute mortality (10 minutes) would occur. Because of this, the exposure threshold was rarely reached resulting in areas of less than 0.04 mi^2 exceeding the threshold for wildlife impacts in both the unmitigated and mitigated scenarios. This does not mean that all species would be directly affected within this area; wildlife type and behavior would determine the scope of effects on each species as well as the percent likelihood of encountering oil. Also, wildlife would likely avoid unsuitable habitat as well as the noise, and lighting created by remediation efforts. Therefore, a release could cause injury and mortality to wildlife resulting in indirect and direct, short-term to long-term, moderate to major impacts on wildlife. If remediation and mitigation measures are promptly deployed, a release could result in short-term to long-term and minor to moderate impacts on wildlife.

Wildlife habitat would not be permanently removed or degraded on a large or regional scale and productivity of local populations would not be lost permanently. The unmitigated scenarios pose a greater risk of oil dispersion and extent than mitigated scenarios because implementation of mitigation measures focus on minimizing damage to wildlife habitats and preventing oiling of semi-aquatic or terrestrial species that are frequently found near waterbodies. With a remote to very unlikely likelihood of a WCD crude oil release occurring, the resulting risk on non-aquatic wildlife species would be negligible to moderate and not significant.

Once reaching the surface, at a minimum, crude oil would adhere to vegetation along its flow path, directly or indirectly affecting wildlife that rely on those vegetation communities. Fouling by crude oil can limit thermoregulatory processes of both birds and mammals. Exposure of land-based animals would mainly occur on the feet and legs, but contamination could spread to fur or feathers through grooming or preening. Fur-bearing animals and birds could experience feeding and motility problems due to contact with crude oil and could inhale toxic volatiles (Albers, 2003 as cited in HDR, 2018).

Crude oil toxicity in terrestrial organisms is largely variable due to differences in wildlife behavior. In general, a crude oil release would be most harmful to wildlife species that are attracted to carrion such as coyotes and vultures, as well as birds using shoreline habitat during the migratory season (Henkel et al., 2012). Non-scavenger and fully terrestrial species would more likely avoid the crude oil release (Sharp, 1990 as cited in HDR, 2018). Assuming there is nearby suitable habitat, impacts on fully terrestrial species would be limited (Stubblefield, 1995 as cited in HDR, 2018).

In regards to impacts on migratory and sedentary birds, a crude oil release could have indirect effects due to habitat degradation or have direct effects on some individuals. Direct contact with crude oil could damage the thermal insulation and buoyancy of feathers, leading to hypothermia, stress, injury, and/or mortality (Vermeer and Vermeer, 1975, Jenssen, 1994 as cited in HDR, 2018). From there, birds that are incubating eggs could transfer the crude oil to their eggs from their plumage, resulting in increased embryonic mortality in some species (Hoffman, 1990 as cited in HDR, 2018).

Impacts on mammalian game species from an inadvertent release of crude oil could impact economically and culturally important games species and their prey. As previously mentioned, fully terrestrial non-scavenger wildlife would likely avoid the release, but if they did not these species could experience oiling. If crude oil adheres to vegetation that is consumed by ungulates such as deer, then vegetation mortality, a decrease in flower bud and seed development, and a reduction in forage availability to wildlife would occur (Racine, 1994 as cited in HDR, 2018). If game species travel over the impacted area, crude oil would spread to the feet and legs and could be ingested through grooming and preening (McEwan et al., 1974 as cited in HDR, 2018).

Additionally, game species could be dispersed by oil releases, resulting in behavioral changes and increased competition in nearby areas. Refer to Section 3.8.2, Environmental Justice, for information regarding impacts on subsistence hunting.

The effect metric that poses the greatest risk to semi-aquatic and fully aquatic mammals is the EA-100 for aquatic biota assuming average sensitivity of species. In the unmitigated scenarios, the range of areas that EA-100 for aquatic biota assuming average sensitivity species was identified as being less than 0.04 mi^2 to 2.4 mi^2 of water during ice-free conditions and 0.4 to 2.4 mi^2 for ice-covered conditions. Mitigation measures would reduce the dispersal area and therefore the mitigated scenario areas ranged from less than 0.04 to 0.1 mi^2 under ice-free conditions and 1.3 to 2.4 mi^2 for ice-covered conditions.

As discussed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, the river area experiencing any mortality is not provided. These areas would be greater than the EA-100 values provided above and vary by scenario based on downstream transport within each scenario as well as trajectory and fate processes, which contribute to changes in both concentration and duration of exposure. Mortality is caused by exposure, which is dependent on concentration and duration. Mortality can occur at concentrations below the thresholds used in this model. Similarly, some fraction of organisms will survive at concentrations above these same thresholds.

Exposure would result in the oiling of semi-aquatic species, wading birds, waterfowl, and fully aquatic mammals and the associated habitats of these species within and along the shores of Lake Oahe. Additionally, these species would experience associated acute and chronic health effects from inhalation or ingestion of released hydrocarbons, as discussed more in the following paragraphs (EPA, 1999). During a release, any species that spends time in aquatic and shoreline habitats are at the greatest risk. For the same reasons as described above for terrestrial wildlife, the potential that a semi-aquatic or fully aquatic species would be present at the time of thickest oil exposure was very low. Habitat for these species would not be permanently removed or degraded on a large or regional scale and productivity of local populations would not be lost permanently. Impacts on these receptors from an inadvertent release would therefore be indirect and direct, short- to long-term, and moderate to major impacts reduced to minor to moderate following the implementation of mitigation. With a remote to very unlikely likelihood of a WCD release occurring, the resulting risk on aquatic wildlife species would be negligible to moderate and not significant.

If a crude oil release were to impact Lake Oahe, the nearby Cannonball River, or any nearby tributaries, it would impact any semi-aquatic species present at the time, along with contaminating their aquatic habitat. Semi-aquatic wildlife species could be oiled, and fully aquatic mammals such as beavers, minks, muskrats, wading birds, and waterfowl would have a high likelihood of being oiled. In some cases, this could lead to behavioral changes in semi-aquatic mammals, such as changes in their willingness to enter the water, and suggests that mortality would occur for semi-aquatic mammals that swim through the crude oil (Wolfe and Esher, 1981 as cited in Appendix G). Additionally, a crude oil release impacts on these waterbodies would also contaminate drinking water for economically and culturally important big game species.

In addition to the measures identified in Section 3.1, Reliability and Safety, to prevent and/or minimize the impacts of crude oil release, Dakota Access has plans in place to rescue and rehabilitate fish and wildlife in the Project Contingency Plan for Oiled Wildlife, and has contracted with multiple wildlife rehabilitation services to assist in the event of an incident, as described in its 2021 FRP and GRP (see Appendix F). Dakota Access also has personnel trained and approved by the USFWS to treat oiled wildlife in the event of an accidental release.

The increase in vessel traffic and human disturbance during this remediation and rehabilitation would likely cause indirect, short- to long-term, and minor disturbances on wildlife in the area, particularly semi-aquatic species and water birds and waterfowl. While adults would be able to move away from remediation activities, vessels and other equipment could cause injury or mortality of the young. In addition, crude oil that cannot be removed and remains in soils and sediments could cause chronic toxicity by being passed up the food chain or in drinking water, affecting wildlife health and vitality in the long-term. However, contaminant levels could likely be minimized through prompt deployment of remediation and clean-up measures, and any remnant oil would be expected to decrease over time through degradation, evaporation, and dilution.

In conclusion, given the negligible to moderate risk of a crude oil release, impacts on wildlife from Alternative 3 are not expected to be significant.

Alternative 4

No additional construction impacts would occur under Alternative 4 beyond those discussed in Section 3.5.1.1, [Wildlife] Project Background.

Operational impacts from a potential crude oil release would be the same as those discussed above in Alternative 3. Increased mitigation measures, more advanced leak detection and protection, and more stringent conditions would further decrease the risk and impact of a crude oil release (see Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions; and Section 3.5.2.3, [Aquatic Resources, Impacts and Mitigation] Alternative 4).

In conclusion, given the negligible to moderate risk of a crude oil release, impacts on wildlife from Alternative 4 would not be significant.

Alternative 5

The North Bismarck Reroute would be approximately 111 miles long. This route passes mostly through agriculture fields and areas that are previously undisturbed by pipelines. Compared to the existing route, construction would be in nearly identical habitats. This route also passes within 6 miles of the Long Lake National Wildlife Refuge and within 2.1 miles of the Appert Lake National Wildlife Refuge. Impacts from construction of this pipeline would include lighting, noise, habitat disturbance, and potential inadvertent releases of hazardous materials. These impacts would be similar to what is described above in Section 3.5.1.1, [Wildlife] Project Background. The 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of minor permanent impacts totaling approximately 1.1 acres of habitat loss. Overall, with the implementation of standard mitigation practices, impacts from the construction of the North Bismarck Reroute on wildlife would generally be temporary and permanent, and negligible to moderate.

During operation, the magnitude of impacts on wildlife from a crude oil release would likely be the same or similar to those described under Alternative 3, short- to long-term and moderate to major, and when combined with a frequency of remote to very unlikely, the resultant risk is minor to moderate.

Construction of the North Bismarck Reroute would be 3 percent collocated with other utilities compared to 41 percent collocated with the constructed route, resulting in more disturbance and dispersal of wildlife within undisturbed greenfield areas compared to the original route. Operationally, impacts would be similar to the impacts discussed in Alternative 3.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail until the North Bismarck Reroute is operational. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via trucking and/or rail discussed below.

Abandonment of about 100 miles of pipeline would impact wildlife through temporary light and noise in the areas where ground disturbance for digging, cutting, purging, capping, and backfilling line segments would occur. This would result in indirect, temporary, and minor impacts throughout the pipeline right-of-way.

Trucking and/or railway transport of the oil could result in wildlife collisions, lighting, noise, and inadvertent crude oil releases. Lighting and noise disturbance could alter wildlife behavior and movement, and collisions with wildlife would cause injury or mortality with any terrestrial species that are prone to inhabit areas near roads, such as rabbits, skunks, raccoons, and deer. Because existing highways and railroads would be used, wildlife species are likely already acclimated to the occasional increases in lighting and noise caused by the transportation routes.

Inadvertent releases from a truck or railcar could result in oiling, loss of habitat, and chronic health impacts in wildlife. Impacts of a crude oil release from a truck or railcar would be similar to what is described above in Alternative 3, and as noted in Section 3.1, Reliability and Safety, and Section 3.9, Transportation and Traffic. Road and rail tend to have more frequent albeit smaller releases of hazardous materials than pipelines, resulting in easier cleanup and remediation (Green and Jackson, 2015); however, habitat recovery could still take a number of years (see the discussion above for Alternative 3). Overall, trucking and rail would have short- to long-term and minor to moderate impacts on wildlife.

In conclusion, construction and operation impacts on wildlife for Alternative 5 would not be significant given levels of intensity and duration of the impacts discussed above.

Alternative 5 would include abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Although there would be extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on wildlife for Alternatives 5 and 1 would not be significant because wildlife populations and habitat would be expected to recover. The combined construction and operation impacts on wildlife for Alternatives 5 and 2 would not be significant.

3.5.2. Aquatic Resources

The aquatic resources section addresses fish and other aquatic species that could occur in the Project Area. Game species important as subsistence resources occur in the Project Area and are discussed in this section as well as in Section 3.8.2, Environmental Justice. Federally protected species are discussed in Section 3.5.3, Federally Protected Species.

This section provides an analysis of the affected area, impacts, and mitigation from the past and future Project activities on aquatic resources under Alternatives 1 through 5. For aquatic resources, significant impacts would be those permanently removing or degrading aquatic habitat, or causing mortality and/or long-term to permanently reduced productivity of local populations of aquatic species. The final intensity and duration of impacts are determined once mitigation measures are taken into account. Impact significance is based on impact intensity, duration, and likelihood.

3.5.2.1. Project Background

The following discussion describes the affected environment at the time the 2016 EA was written and the impacts on aquatic resources that occurred during pipeline installation and nearly 6 years of Project operation.

2016 Affected Environment

Aquatic Habitats

The aquatic habitat in the affected area consists of freshwater habitat in a temperate climate that supports both warm-water and cold-water fisheries. It includes Lake Oahe and adjacent tributaries and wetlands, including the Cannonball River (see Section 3.3, Water Resources, for a detailed description of Lake Oahe and adjacent water resources). Throughout the potentially affected area, the width of Lake Oahe ranges between a little less than 1 mile and about 3 miles. Much of this segment is more river-like in appearance than other parts of Lake Oahe and is characterized by both submerged and emergent snags, sandbars, many shallow areas, and a definite current (USACE, 2016a). In winter, ice generally covers the lake between January and March for an average of 66 days, although freeze-up has occurred as early as November 30 and break-up as late as April 28 based on data collected between 1959 and 2019 (USACE, 2021a). Conversely, the lake does not freeze over every winter; based on data recorded since 1958, it has remained open nine times between 1982 and 2020.

Adjacent waterbodies and wetlands (see Section 3.3, Water Resources) contribute to the diversity of habitats available to support aquatic organisms in the affected area. In addition, the confluence of tributaries with Lake Oahe can be areas of high fish abundance and diversity; for example, the SRST and New Century Environmental (NCE) 2017 baseline fish surveys in a 30-mile study area of Lake Oahe adjacent to the Standing Rock Sioux Tribe Reservation in North Dakota found the highest level of fish diversity and abundance of larval and juvenile fish at major confluences with the Missouri River (SRST/NCE, 2017 as cited in HDR, 2018). SRST surveys in 2021 made similar findings at 15 locations along the Missouri River (SRST, 2021). Notably, the Project crossing location is only about 0.5 mile from its confluence with the Cannonball River. Conversely, areas heavily used by livestock appeared to have lower fish abundance based on survey findings (SRST, 2021).

As noted in Section 3.3.1, [Water Resources] Surface Waters, Lake Oahe is classified as a Class I stream, which is defined as waterbodies that are suitable for the propagation and/or protection of resident fish species and other aquatic biota, among other uses according to North Dakota Administrative Code 33-16-02.1-01. Water quality is generally good, with few exceedances of water quality standards (see Section 3.3.1, [Water Resources] Surface Waters).

The pipe storage and pull-back area crossed an ephemeral drainage. During periods of no or low flow, the drainage would be of limited value for fish and other aquatic biota. When water is present, the drainage could provide habitat for semi-aquatic species (e.g., amphibians) and aquatic life stages of other organisms (e.g., insects). No water was documented within the ephemeral drainage during construction.

The following sections describe the specific aquatic habitats likely to occur in the affected area of Lake Oahe, including the surface layer, pelagic habitat, and benthic habitat.

Surface Layer

The Project Area contains extensive surface water habitat for water birds and waterfowl (see Section 3.5.1, Wildlife). Pelagic fish may also use surface waters for feeding, evading predators, and gulping air.

Pelagic Habitat

Pelagic habitat contains the water column between the surface water and lake bottom. At the crossing location, this habitat is between 3 and 30 feet deep, although throughout the potentially affected area, pelagic habitat ranges between about 46 and 60 feet depending on a pool elevation that fluctuates as much as 30 to 40 feet due to adjustments for impoundment storage (USACE, 2019). Its characteristics vary depending in part on distance from shore, the depth of the water column, and inputs from tributaries, which can affect nutrient levels, temperature, and turbidity.

Benthic Habitat

Benthic habitat consists of bottom sediments and extends from the littoral zone—where vegetation also contributes to benthic habitat—to the aphotic zone—where light does not penetrate and vegetation does not occur. The littoral zone—where light levels support the growth of aquatic vegetation—extends to between about 1.7 to 12 feet in Lake Oahe (USACE, 2019). Lake Oahe is not known to contain extensive aquatic vegetation. According to the South Dakota Department of Game, Fish and Parks (Fincel et al., 2016), submerged macrophytes have been slow to develop in Lake Oahe due to fluctuating water levels, unsuitable substrate, windswept shorelines, and shoreline turbidity. Most submerged vegetation is terrestrial because of the fluctuating water levels. Examples of submerged aquatic vegetation that have been found in the affected area include a number of pondweed species (e.g., *Potamogeton crispus*, [SRST, 2021]), horned pondweed (*Zanichellia palustris*), and white water crowfoot (*Rannuculus longirostris*). Emergent vegetation includes arrowhead (*Sagittaria latifolia*), water smartweed (*Polygonum amphibium*), and broad leaf cattail (*Typha latifolia*). Aquatic vegetation is important as forage for water birds and waterfowl, as well as for various invertebrates that support local food webs, and can serve as important shelter for amphibians, reptiles, and juvenile fish (Wersal and Madsen, 2012).

At the crossing location and the rest of the potentially affected area, bottom sediments generally consist of a thin layer of silty material except where tributaries enter the lake, where larger clay- to sand-sized sediment settle to the lake bottom while finer material is carried into the lake and forms a delta (USACE, 2010). Underlying this "mud" layer of silt, clay, and/or sand are varying depths of either a predominantly clay substrate or a sandy silt substrate overlying a clay-sand substrate based on geotechnical borings completed for the design of the HDD crossing (GeoEngineers, 2015). The predominantly clay layers extend between about 2.5 to 26 feet deep.

Aquatic Organisms

A variety of species rely on the aquatic habitat in Lake Oahe, including fish, BMIs, and amphibians and reptiles, which are discussed in detail below. In addition, semi-aquatic mammals and water birds and waterfowl use Lake Oahe and its shoreline as habitat; these species are discussed in Section 3.5.1, Wildlife. Threatened and endangered species are discussed in Section 3.5.3, Federally Protected Species.

Fish

Freshwater fish are critical elements of the aquatic food chain, ranging from herbivores to top predators and acting as prey for birds, other fish, and mammals (HDR, 2018). They are culturally and economically important, including to tribal groups. They are often used as indicators of waterbody health given their life span, multiple trophic levels, ease of sampling, environmental sensitivity of many species, and other attributes (Karr, 1981 as cited in HDR, 2018).

Over 40 freshwater fish species are found in the affected area of Lake Oahe and adjacent waters (Gabel, 1974, Hoagstrom et al., 2011, Meyer et al., 2015, NDGFD, n.d. as cited in HDR, 2018). A number of these are important game species used by the general public and are important for tribal subsistence (see Appendix H for examples of subsistence species and Section 3.8.2, Environmental Justice, for a complete list). Other important species in the affected area include prey species of the game fish. The confluence of Lake Oahe with the Cannonball River is noted to be an important rearing area for larger game species such as walleye (*Sander vitreus*), northern pike (*Esox Lucius*), yellow perch (*Perca flavescens*), and smallmouth bass (*Micropterus dolomieu*); along with numerous prey and forage species like shiners and chubs (SRST, 2021). SRST surveys of the area downstream from the Lake Oahe crossing identified 19 fish species (SRST, 2021). The species caught most frequently included the common carp (*Cyprinus carpio*), silver chub (*Macrhybopsis storeriana*), red shiner (*Cyprinella lutrensis*), and channel catfish (*Ictalurus punctatus*) (SRST, 2021). In addition, North Dakota's *State Wildlife Action Plan* designates nine fish species in the Missouri River System (which encompasses the entire Missouri River reach from Montana to North Dakota) as a conservation priority (NDGF, 2015) (see Appendix H).

Fish in the affected area include both demersal (i.e., bottom-oriented) and pelagic species, although most species in the affected area are pelagic. Demersal species like channel catfish tend to occupy and feed in locations near the bottom of the lake, while pelagic species like northern pike use the whole water column (HDR, 2018). Species move between spawning, summer, and wintering habitats, which can include Lake Oahe, tributaries, and flooded wetlands and backwaters (see Appendix H for habitat descriptions). Spawning areas range from shallow areas in Lake Oahe main channel areas consisting of large, turbid portions of the river, to adjoining tributaries and wetlands. Spawning may occur as early as February (e.g., burbots), while some species may not spawn until water temperatures have warmed to 50.0 to 55.4 °F (e.g., blue sucker).

Benthic Macroinvertebrates

BMIs are an important component of the aquatic food web by providing a food source for fish, bats, and other wildlife, and by processing detritus (HDR, 2018). Freshwater BMIs occur on a variety of substrates in benthic habitat, including soft sediments, large rocks, submerged logs, and aquatic vegetation (Klemm et al., 1990 as cited in HDR, 2018). Depth strongly influences BMI composition and abundance (HDR, 2018). Freshwater BMIs include insects, annelids, mollusks, flatworms, and crustaceans; and exist as herbivores, omnivores, or predators (Klemm et al., 1990 as cited in HDR, 2018). Some BMIs such as freshwater mussels can be important commercial or recreational species. BMIs can also be used as indicators of water quality or impaired conditions given their sensitivity to stress, limited mobility, life spans, widespread distribution, and ease in sampling (Klemm et al., 1990 as cited in HDR, 2018). Their characteristics reflect recent conditions and can help detect infrequently discharged pollutants that are difficult to detect with periodic chemical sampling (Klemm et al., 1990 as cited in HDR, 2018). In addition, the occurrence of contaminants in sediments and other substrates can be incorporated into BMIs, which can then pass the contaminants up the food chain, potentially leading to increased concentrations in higher-level organisms through biomagnification (HDR, 2018).

In the affected area of Lake Oahe, the BMI assemblage is dominated by aquatic oligochaetes (annelid worms) and chironomids (midges) (Scharold et al., 2006 as cited in HDR, 2018). The Missouri River High Consequence Area Assessment found a variety of BMIs near the Lake Oahe crossing, including insect larvae (e.g., mayflies [*Ephemeroptera*], stoneflies [*Plecoptera*], and flies [*Diptera*]), annelids (worms and leeches), molluscs, crustaceans, and other groups such as flatworms, nemerteans (e.g., ribbon worms), and cnidarians (SRST/NCE, 2017 as cited in HDR, 2018). SRST surveys conducted in 2021 identified a species of mayfly (*Heptagenia limbata*) and midge (*Orthocladiinae* spp.) in Lake Oahe, and three species of craneflies (*Antocha*, *Hexatoma*, and *Tipula* spp.) in the Cannonball River (SRST, 2021).

Amphibians and Reptiles

Amphibians that occur in the affected area of Lake Oahe and adjacent waters include frogs, toads, and salamanders; reptiles include turtles (HDR, 2018). Amphibian species in the affected area include the northern leopard frog (*Litihobates pipiens*), boreal chorus frog (*Pseudacris triseriata*), Great Plains toad (*Anaxyrus cognatus*), Woodhouse's toad (*Anaxyrus woodhousii*), and tiger salamander (*Ambystoma tigrinum*). Common reptile species include common snapping turtle and western painted turtle (*Chrysemys picta*). There are three reptile species in the Missouri River System listed as a conservation priority in North Dakota's *State Wildlife Action Plan*: smooth softshell turtle (*Apalone mutica*), spiny softshell turtle (*Apalone spinifera*), and false map turtle (*Graptemys pseudogeographica*) (NDGF, 2015). A smooth softshell turtle and snapping turtle were both seen during SRST surveys in 2021 (SRST, 2021).

As adults, these species are semi-aquatic; juvenile reptiles are also semi-aquatic, while juvenile amphibians are entirely aquatic (HDR, 2018). Adult snapping turtles spend most of their lives along the water bottom as deep as 32 feet. Most aquatic reptiles and amphibians hibernate underwater buried in mud and sediment of shallow lakes and wetlands (HDR, 2018), although some frog species can remain active in underwater environments during the winter (Tattersall and Ultsch, 2008 as cited in HDR, 2018).

Reptiles generally breed in May or June and lay their eggs in upland areas, while amphibians generally breed between May and June or as early as March through May as with the boreal chorus frog. Amphibians lay their eggs in shallow waters in a range of aquatic habitats from wetlands and slow-moving streams to lakes.

The food sources for amphibians generally include aquatic and terrestrial invertebrates, although species such as the northern leopard frog also consume small vertebrates such as small frogs and fish. Amphibian larvae feed on algae, detritus, other larvae, or small invertebrates. Turtles consume small animals, invertebrates, and aquatic vegetation.

Impacts and Mitigation

Impacts on aquatic resources from pipeline construction were limited to the pull-back areas as there was no ground disturbance or in-water work on federal property or within Lake Oahe. In addition, construction did not result in any inadvertent returns of drilling mud during HDD, nor did any release of hazardous material occur into aquatic habitat. Thus, there were no impacts from inadvertent releases caused by the Project. Direct impacts on the ephemeral drainage crossed by the pull-back area and any aquatic or semi-aquatic life stages of BMIs, reptiles, or amphibians present in the drainage during construction were avoided by bridging the waterways for equipment and vehicle traffic during pipe stringing, fabrication, and pull-back. Moreover, no water was documented within the ephemeral drainage during construction. Erosion control measures were put in place during construction and restoration according to the Project ECP and SWPPP, and Dakota Access stated that there were no issues with erosion / stormwater runoff during construction. Following construction, the Project Area was restored, revegetated, and monitored in accordance with applicable regulations and permit conditions. Therefore, there is a low likelihood that sediment was transported from the workspace into the ephemeral drainage, the Cannonball River, or Lake Oahe during precipitation events, increasing the local turbidity and sediment load and affecting sensitive fish eggs, fish fry, and invertebrates inhabiting shallow aquatic habitats. Setbacks of approximately 1,100 feet on the west bank and 900 feet on the east bank further reduce potential stormwater runoff into Lake Oahe.

No water was withdrawn from Lake Oahe for hydrostatic test water. Municipal sources provided hydrostatic test water, which was then discharged to the ground in the HDD workspace on the west side of Lake Oahe in accordance with the requirements of the General Permit for Temporary Discharges issued by the North Dakota Department of Health on May 9, 2016. The discharged water did not enter Lake Oahe either directly or indirectly and, therefore, had no impacts on aquatic resources.

With implementation of erosion and sediment controls and adherence to hydrostatic test discharge permit conditions, construction impacts on aquatic resources from stormwater runoff were indirect, negligible, and temporary. In addition, no releases or maintenance activities took place on federal land during nearly 6 years of operation; therefore, Project operation has had no effect on aquatic resources to date.

3.5.2.2. Current Affected Environment

The only changes to aquatic resources since the 2016 EA include permanent access roads that were built outside of federal property and beyond the scope of the Project. These roads were not constructed as part of this Project; as a result, the impacts of the road are considered in Chapter 4, Cumulative Impacts. The access road on the western side of the Project Area crosses the ephemeral drainage described in Section 3.5.2.1, [Aquatic Resources] Project Background.

3.5.2.3. Impacts and Mitigation

The following sections describe the impacts and mitigation that would occur due to future construction and operational activities for each of the five alternatives.

Alternative 1

In addition to the impacts from pipeline installation discussed above in Section 3.5.2.1, [Aquatic Resources] Project Background, impacts on aquatic resources would occur due to pipeline abandonment by removal under Alternative 1. Pipeline removal would involve a high level of water and soil disturbance for an estimated 6 to 20 years or more.

Removing the pipe would involve the construction of cofferdams that would allow the river to continue flowing on one side of the channel while excavation takes place on the other side. This short- to long-term alteration would result in a modified flow that could alter aquatic habitat, such as increased flow rates and volumes past the cofferdams that could scour the riverbanks or river bottom, and/or backed up water in upstream habitat along with reduced water levels downstream. These changes would likely be long-term and limited to minor changes in the redistribution of aquatic organisms within the immediate area.

Accessing the pipe under Lake Oahe would also require excavation that may include dredging the lake bed above the pipeline. These activities would result in impacts on aquatic resources that would include high-intensity degradation of aquatic habitat for at least 6 years, including the long-term removal and mixing of benthic sediments, increased turbidity, resuspension of contaminants in the water column, and increased sedimentation. Dakota Access assumes that about 10 percent of the excavated volume would be lost downstream during excavation and dewatering activities, resulting in a total sediment load downstream of 18,950,400 cubic feet (1,137,023 tons). Based on sediment transport modeling, sediments would fall out of suspension at varying distances from the dredge site, with the smallest particles expected to travel about 160 miles downstream. Turbidity levels would be predicted to be as high as 1,229 milligrams per liter or 1,082 Nephelometric Turbidity Units at the dewatering release site, reducing to about 236 Nephelometric Turbidity Units about 1,000 feet from the crossing. The majority of the sediment load would likely come from dewatering, despite the implementation of mitigation measures that would include silt fences, straw barriers, sandbags, plastic sheeting, benching, berms, and flow collection drainage paths to remove sediment loading prior to entering the well of the dewatering pumps. Water entering the dewatering pit would still be laden with sediment, particularly during wet weather events and continual seepage.

These changes in aquatic habitat and water quality would have indirect effects on aquatic organisms by causing reduced productivity, altered behaviors, stress, and mortality in many aquatic organisms in the pipe removal area and upstream and downstream; the extent, intensity, and duration of these effects would depend on flow rates, sedimentation rates, and the subsequent extent of the resulting sediment plume. In addition, direct effects on aquatic organisms would likely include injury and mortality from damming and dredging equipment.

Some species (primarily adult fish and turtles) may be able to escape up or downstream at the commencement of activities; however, others such as BMIs, larval and juvenile fish, and amphibians would be more likely to experience harmful effects, including mortality from excavation or dredging and spoil storage on adjacent upland areas. Once the pipe is removed and the area restored, aquatic habitat conditions would likely return to baseline within 1 to 2 years, depending on flow conditions in the channel.

If stormwater runoff from dredge spoil piles and exposed soils caused by excavating and removing the pipe in upland areas increase turbidity and sedimentation in aquatic habitat, detrimental effects on aquatic organisms are possible, as noted above. Erosion and sediment control measures in the Project ECP and SWPPP would be implemented to reduce these impacts.

Based on the assessment above, direct and indirect impacts from abandonment by pipe removal would be short- to long-term and major.

There would be no operation associated with Alternative 1 at the Lake Oahe crossing, and so there would be no operational impacts associated with a pipeline under Lake Oahe, including no risk of a crude oil release from federal property.

In conclusion, impacts from abandonment by pipe removal would be significant as they would likely result in local mortality of aquatic organisms over multiple years due to physical injury from equipment and habitat disturbance.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

In addition to the impacts from pipeline installation discussed above in Section 3.5.2.1, Project Background, impacts on aquatic resources could occur due to pipeline abandonment under Alternative 2.

During pipeline abandonment, water quality could be temporarily reduced due to ground disturbance and stormwater runoff from digging, cutting, purging, capping, and backfilling the ends of the pipe in upland areas. Erosion control measures would be implemented based on the Project SWPPP and ECP to minimize these impacts. No impacts on aquatic resources are anticipated from the abandoned pipe.

With implementation of erosion and sediment controls and adherence to hydrostatic test discharge permit conditions, construction impacts on aquatic habitat from stormwater runoff would be indirect, negligible, and temporary.

There would be no operation associated with Alternative 2 at the Lake Oahe crossing, and so there would be no operational impacts from the pipeline under Lake Oahe, including no risk of a crude oil release from federal property.

In conclusion, impacts on aquatic resources from pipeline abandonment at the Lake Oahe crossing would not be significant.

In addition, as described for Alternative 1, Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, along with the combined impacts of Alternative 2 and 5, are described under Alternative 5.

Alternative 3

No additional construction impacts would occur on aquatic resources under Alternative 3 beyond those discussed above in Section 3.5.2.1, [Aquatic Resources] Project Background.

Operational impacts would be limited to those associated with a potential inadvertent release of crude oil from the pipeline. The following sections discuss crude oil toxicity for aquatic organisms and the impacts based on the modeling, which is discussed in more detail in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3. This analysis is primarily based on three reports prepared for the Project: the *Review of Potential Environmental Effects of Oil Releases on Downstream Receptors* (HDR, 2018), the PHMSA Modeling Report (Appendix G), and the FRP Modeling Report (Appendix G), including the references provided therein.

Crude Oil Toxicity

Aquatic organisms can be exposed to oil toxicity through inhalation, ingestion as a result of drinking or eating contaminated water and food, or absorption. Once reaching the water surface, oil would adhere to vegetation, sediment, detritus, and other substances along its flow path, which could directly or indirectly affect aquatic organisms that live on or ingest those substances. Crude oil is composed of a number of toxic compounds, particularly the lower molecular weight aromatic compounds that include PAHs and monoaromatic hydrocarbons such as benzene, toluene, ethylbenzene, and xylene (BTEX). These types of compounds act by accumulating in lipids and disrupting cellular and tissue function (Appendix G). Bakken crude oil is a light crude oil with low viscosity similar to other light crude oils, but with a slightly higher percentage of BTEXs and other monoaromatic hydrocarbons (Appendix G). Other components of crude oil could also contribute to toxic effects on aquatic organisms depending on their level of toxicity combined with their bioavailability, which is influenced by their solubility and volatility (Appendix G). Harmful effects are not only a function of the toxicity of each compound in the oil, but also the concentration and duration of exposure to each receptor.

BTEX constituents are readily soluble and can become bioavailable in solution in the short-term. However, they are likely to have less impact on aquatic organisms in the longer term than PAHs because they are also volatile and evaporate much faster than they dissolve. Therefore, toxic concentrations of BTEXs would not generally persist. The majority of BTEXs have typically evaporated within several hours of an initial release. For these reasons, the effects due to BTEXs after a crude oil release are typically low and of short duration (Appendix G).

In general, PAHs and many of the alkyl-substituted benzenes are less volatile than BTEXs and therefore remain on the water surface for longer periods of time. This gives them more time to dissolve in substantial bioavailable quantities. Because they are also more hydrophobic than BTEX, they more strongly partition into the lipids in membranes and tissues. Thus, they typically result in more acute toxic effects on aquatic organisms than BTEX (Appendix G). Higher molecular weight hydrocarbon compounds and higher alkylated PAHs are more likely to cause chronic effects since they can persist for long periods in anoxic sediments, sometimes degrading slowly over a period of years (HDR, 2018; Katsumiti et al., 2013).

A scoping comment raised the question of whether it would still be safe to consume fish after a crude oil release. Fish with carcinogenic PAHs consumed in sufficient amounts over a prolonged period of time can be harmful to people and should therefore not be consumed (NOAA, 2021). Following a crude oil release, fish should only be consumed once testing shows that fish are no longer contaminated (NOAA, 2021).

Pelagic Fish. Pelagic fish in Lake Oahe would be susceptible to acute and chronic toxicity from in-water and surface oil contamination, as well as indirect impacts by altering essential habitat (Lee, 2015 as cited in HDR, 2018). Oil compounds trapped in sediments or along the shoreline can also gradually leach into and become resuspended in the water column, where they can affect pelagic fish (HDR, 2018; Appendix G). Chronic exposure could occur as a result of the bioaccumulation of PAHs in fish tissue, which can lead to phototoxicity, resulting in cell and tissue death (HDR, 2018). Phototoxicity is more likely to occur in fish near the water surface, in summer with greater light availability, and in certain larval or juvenile fish (HDR, 2018). Sublethal effects of fish exposed to PAHs can include altered feeding behavior, fish egg and embryo development effects, reduced cardiac fitness, immune dysfunction, increased incidence of liver lesions, and impaired swimming by early life stages (Incardona et al., 2015, Lee et al., 2015 as cited in HDR, 2018; Honda and Suzuki, 2020).

The mobility, selectivity in foods, and ability to detoxify many oil compounds of juvenile and adult fish help make them less susceptible to oil toxicity (Hodson, 2008, NMSF, 2017 as cited in HDR, 2018). Their ability to metabolize and excrete hydrocarbons may also help reduce the effects of bioaccumulation (HDR, 2018). Conversely, fish eggs and larvae are more vulnerable to toxic oil constituents given their small size and limited mobility and their poorly developed membranes and detoxifications systems (HDR, 2018). Few studies have demonstrated increased mortality of fish as a result of crude oil release; however, they have shown that oil releases close to spawning grounds or egg and larval drift areas can lead to increased levels of acute or chronic effects (Langangen et al., 2017 as cited in HDR, 2018).

Fish mortality resulting from acute toxicity is generally short-term as the majority of contamination would vaporize, degrade, or be diluted. Populations have been documented as recovering within the first year of a release with remediation (Katsumiti et al., 2013; Mendelssohn et al., 2012; Rissik and Esdaile, 2011).

BMIs and Demersal Fish. BMIs and demersal fish would be susceptible to acute toxicity (mortality) from sediment contamination and oil dissolved or entrained in the water (Appendix G), particularly in shallow or turbulent waters where entrained oil is more likely to reach the bottom of the water column or where oil is seeping into the water column through sediments as a result of subsurface flow. Juvenile and adult demersal fish may be less susceptible to oil contamination due to their physiology, as described for pelagic fish. Since contaminant levels can remain elevated for longer periods of time in sediment compared to those in the water column, BMIs and demersal fish could also experience chronic exposure effects from sediment contamination. An oil release could also smother or degrade benthic habitat by altering essential habitat characteristics. For example, it could increase the nutrient release from sediments, increase algal production, decrease dissolved oxygen levels during oil decomposition, and decrease decomposition of natural sources of organic matter (Crunkilton and Duchrow, 1990 as cited in HDR, 2018). Over time, oil constituents become biodegraded, weathered, or dispersed, allowing benthic communities to recover. A study at a previous crude oil release in a freshwater creek (Asher Creek in Missouri) documented complete recovery of BMI diversity and population within 6 to 9 months (Crunkilton and Duchrow, 1990). Contamination in depositional areas adjacent to Lake Oahe (e.g., pools and backwaters, or areas where the river deposits sediment) could, if left unmitigated, result in longer-term impacts because oil would not be as readily diluted and transported downstream (EPA, 1999).

Amphibians and Reptiles. A crude oil release could affect amphibians and reptiles in various ways, including adhesion (i.e., oiling) of exposed individuals, acute and chronic toxicity effects through ingestion and inhalation, and habitat effects. The effects of oil contamination on inland freshwater amphibians and reptiles are variable and are not as well understood as for other organisms (Albers, 2003, Malcolm and Shore, 2003, Lee et al., 2015 as cited in HDR, 2018), although higher levels of mortality may be associated with light crude oil (HDR, 2018). Not many studies have been published studying the effects, and fewer affected individuals may be detected following a release due to their tendency to seek shelter in sediment or aquatic vegetation (HDR, 2018). Impacts also seem to be species-dependent or even population-dependent (Marquis et al., 2006, Van Meter et al., 2006 as cited in HDR, 2018).

Some evidence indicates that oil-induced mortality is more common in amphibians than reptiles, particularly for late-stage tadpoles, although the extent of injury varies (Lee et al., 2015, Albers, 2003 as cited in HDR, 2018). Conversely, amphibian embryos may be less sensitive to crude oils than fish embryos (Albers, 2003 as cited in HDR, 2018). Some data suggest that frog eggs may be protected by their jelly coating (Mahaney, 1994, Marquis et al., 2006 as cited in HDR, 2018). The soft skin of amphibians also makes them susceptible to dermal exposure from oiling. This effect would primarily involve adult amphibians in the spring, summer, and fall if exposed to an oil slick moving back and forth between the water and shoreline (Stabenau et al., 2006 as cited in HDR, 2018). In winter, hibernating individuals buried in sediment would not be exposed to oil in the water column, although some species such as certain frog species are active in winter and could be exposed, particularly if oil is trapped under ice (HDR, 2018).

Adult and juvenile turtles could also become oiled under the same circumstances as amphibians (HDR, 2018). However, one study found that survival and home ranges were no different for oiled adult turtles than non-oiled turtles (Saba and Spotila, 2003 as cited in HDR, 2018). Similarly, other studies found that fertility and clutch sizes of female snapping or painted turtles exposed to crude oil were not affected, although there was an effect on embryonic development (Bell, 2005, Bell et al., 2006 as cited in HDR, 2018). Oiling of reptile eggs could create barriers to respiration and cause the embryos to die (Row and Mitchemore, 2009 as cited in HDR, 2018), although evidence suggests this impact could be species or population specific; no effects to diamondback terrapin and snapping turtle egg survival or hatchling biology were found after exposure to light crude oil in experimental studies (Rowe and Mitchelmore, 2009 as cited in HDR, 2018).

Impacts of a crude oil release on habitat could have indirect effects on amphibians and reptiles, including habitat loss, increased predation risk while being displaced, and loss of food sources, including vegetation, algae, invertebrates, and fish. Remediation efforts to clean up oil could cause injury or mortality to less mobile species and further disturb aquatic habitat, particularly with wetland drainage (Environment Canada, 2013 as cited in HDR, 2018). Impacts would occur as a result of increased turbulence in the water column and sediment removal and disturbance, causing increased turbidity and/or a resuspension of oil in the water column. Following cleanup, impacts would be short- to long-term as oil is degraded, vaporized, or diluted and populations recover (Katsumiti et al., 2013; Mendelssohn et al., 2012; Rissik and Esdaile, 2011). Oil Release Impacts

Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Modeled Release Scenarios, describes WCD unmitigated and mitigated scenarios that were modeled to account for the greatest contamination on the water surface, becoming entrained in the water column, and along the shoreline for both an in-water and onshore release. An in-water release would likely travel farther in Lake Oahe, the onshore release would directly affect additional waterbodies, first flowing into the Cannonball River from an unnamed tributary before moving into Lake Oahe. Each of these scenarios also involves similar levels of sediment contamination. Contamination in these different habitat layers would have varying levels of impacts on different types of aquatic and semi-aquatic organisms, as discussed below.

Species Impacts Based on Oil Distribution

Pelagic fish would likely experience the greatest exposure to oil toxicity from oil in the water column and surface. If oil in the water column reaches the lake bottom, such as in shallow waters less than 10 feet deep, it would also likely affect BMIs and demersal fish. The acute and chronic toxic effects of entrained oil on these species may also be greatest under ice conditions since concentrations of oil constituents are both greater and may persist for a longer time in the same area.

Without ice cover, impacts would spread to the shoreline, as well, where impacts would be greater for early fish and amphibian life stages present in shallow waters along the shore, as well as adult amphibians and reptiles. Oil along the shoreline can continuously become resuspended in adjacent shallow water or affect amphibians and reptiles moving between uplands and the water.

Impacts would affect the greatest number of organisms where surface oil is transported the farthest. Surface oil transport into aquatic habitat adjacent to Lake Oahe, such as tributaries and wetlands, would most likely affect younger life forms of aquatic organisms based on spawning and breeding habitat, as well as amphibians, reptiles, and certain fish species (see Section 3.5.2.1, [Aquatic Resources] Project Background).

While sediment contamination would be lower than water column and shoreline contamination, toxic effects to BMIs, demersal fish, and amphibians and reptiles could still occur—particularly chronic effects—since oil adhered to sediment particles may persist for months to at least 5 years in freshwater systems (Katsumiti et al., 2013; Mendelssohn et al., 2012). Wetlands are particularly susceptible to chronic effects since contaminants tend to persist longer in these habitats (EPA, 1999). Fish and other aquatic organisms could encounter oil-contaminated sediment or food sources when spawning, foraging, or hibernating on or in the lake bottom. Ingestion of sediment oil by BMIs would lead to bioaccumulation as the oil constituents—particularly the PAHs responsible for phototoxicity—get passed up the food chain.

Oil Distribution by Habitat Area

Both an onshore and in-water release would have major impacts on aquatic resources based on the effects described in the Crude Oil Toxicity section above. In particular, an onshore release would likely have the greatest effects on the Cannonball River at the confluence with Lake Oahe, which is an area with a high diversity of aquatic organisms and abundance of larval and juvenile fish, as noted in Section 3.5.2.1, [Aquatic Resources] Project Background.

A large portion of oil, 46 to 48 percent in ice-free scenarios and 36 to 39 percent in ice-covered scenarios, particularly the more toxic components, would evaporate or degrade within 10 days. For an ice-free scenario, this makes up the greatest proportion of the total, followed by oil held in the water column, followed by shoreline, sediment, and surface waters, respectively. Under an ice-covered scenario, the majority of oil becomes entrained in the water column due to the reduced evaporation under ice cover. In addition, currents and water movement under the ice could increase the depth of the entrained oil within the water column, as observed in a crude oil release into the Yellowstone River in 2017 (Nunez, 2015). In general, the greatest effects on aquatic organisms for an in-water release were predicted to occur under ice-covered scenarios. These impacts would affect a wide range of adult aquatic species, potentially including some spawning fish such as burbots (see Section 3.5.2.1, [Aquatic Resources] Project Background).

Impacts would include the oiling of aquatic habitat within and along the shores of Lake Oahe. As noted above, aquatic organisms are mobile species, so the potential that a fish would be present at the time of thickest oil exposure was very low. Impacts on the habitat from an inadvertent release would be direct, short- to long-term, and moderate to major in both unmitigated and mitigated scenarios. With a remote to very unlikely likelihood of a WCD release occurring, the resulting risk on aquatic habitat would be negligible to moderate and the aquatic habitat would be restored, so the impact on aquatic habitat would not be significant.

Toxicity

To quantify the potential effects on aquatic organisms, the effect metric from the modeled scenarios that is most representative of the impacts is the EA-100 for aquatic biota assuming average sensitivity species. In the unmitigated scenarios, the range of areas that EA-100 for aquatic biota assuming average sensitivity species was identified as being less than 0.04 mi^2 to 2.4 mi^2 of water during ice-free conditions and 0.4 to 2.4 mi^2 for ice-covered conditions. Mitigation measures would reduce the dispersal area and therefore the mitigated scenario areas ranged from less than 0.04 to 0.1 mi^2 under ice-free conditions and 1.3 to 2.4 mi^2 for ice-covered conditions. These are conservative estimates, since in reality mobile organisms such as juvenile and adult fish can travel to avoid a dissolved plume of hydrocarbons.

As discussed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, the river area experiencing any mortality is not provided. These areas would be greater than the EA-100 values provided above and vary by scenario based on downstream transport within each scenario as well as trajectory and fate processes, which contribute to changes in both concentration and duration of exposure. Mortality is caused by exposure, which is dependent on concentration and duration. Mortality can occur at concentrations below the thresholds used in this model. Similarly, some fraction of organisms will survive at concentrations above these same thresholds.

While areas of chronic toxicity were not predicted by the modeling, they are most likely to occur in shoreline soil, in sediments at the bottom of Lake Oahe, in low-flow tributaries, and/or in adjacent wetlands. Impacts on these areas may also be the most difficult to mitigate. In the event that oil would seep up into the lake from below, contamination would be less than the contamination for the direct in-water release from the hypothetical pipe. The impacts would also be slightly different. Because a seep from the underground pipe would have to travel through approximately 95 to 126 feet of sediment, less oil would reach the lake over a longer period of time, and much of it would likely be retained in the sediments. Therefore, the affected area would be smaller and more localized, oil concentrations would be lower, and the potential effects would mostly be limited to chronic toxicity of benthic organisms and bioaccumulation up the food chain, as discussed above. Remediation of sediment contamination may not be as effective as surface contamination because contaminated sediments are generally more challenging to access and removing them could release oil into the water column, expanding the affected area. However, because the various oil constituents would degrade, vaporize, and/or become diluted over time, impacts under such a scenario would not be permanent.

Dakota Access has plans in place to rescue and rehabilitate wildlife, including reptiles and amphibians, in the Project Contingency Plan for Oiled Wildlife and has contracted with multiple wildlife rehabilitation services to assist in the event of an incident, as described in its FRP and GRP (Appendix F). Dakota Access also has in place personnel trained and approved by the USFWS to treat oiled wildlife in the event of an accidental release.

Studies of past oil releases found that contamination can last from months to at least 5 years depending on the habitat, remediation, and quantity released (Katsumiti et al., 2013; Mendelssohn et al., 2012; Rissik and Esdaile, 2011). Immediate implementation of mitigation measures would reduce the aerial extent of impacts by blocking the movement of the crude oil and keeping impacts more localized. Remediation activities would address a large portion of the surface and shoreline oil, reducing resuspension on oil in the water column and introduction of oil to bottom sediments, and consequently reducing the concentration of toxic constituents, as well as the duration and intensity of impacts. Depending on the extent of the release, the timing of implementation, and the effectiveness of mitigation measures, the impacts on aquatic species would be similar for both unmitigated and mitigated scenarios.

The acute and chronic impacts on aquatic species from an inadvertent release would be indirect and direct, short- to long-term, and moderate to major in both unmitigated and mitigated scenarios, but reduced with mitigation. Local populations of aquatic species are not anticipated to be affected permanently; however, as noted above, mortality is expected to occur and the impacts would be long-term and therefore significant without mitigation. Although effects would last for at least 5 years, particularly in wetland habitats, remediation of the crude oil release (including natural degradation, evaporation, and dilution of toxic oil constituents) is likely to reduce the intensity of impacts to negligible to minor impacts within about a year (Crunkilton and Duchrow, 1990). With a remote to very unlikely likelihood of a WCD release occurring and the implementation of mitigation measures, the resulting risk on aquatic organisms would be negligible to moderate and not significant.

Remediation activities could cause direct and indirect impacts initially ranging from minor to moderate short- to long-term due to underwater noise and turbidity caused by prop wash from in-water cleanup vessels. These activities could cause local populations of aquatic species to disperse.

In conclusion, construction and operation impacts on aquatic resources (e.g., habitat and species) associated with Alternative 3 are not expected to be significant given the level of risk described above.

Alternative 4

No additional construction impacts would occur under Alternative 4 beyond those discussed in Section 3.5.2.1, [Aquatic Resources] Project Background.

The type of operational impacts would be the same as that described for Alternative 3 and consist of the impacts resulting from an incidental crude oil release. However, additional measures already implemented by Dakota Access would improve the ability to detect a release should existing detection measures fail or a small, slow release should go undetected by monitoring equipment. These measures include maintenance requirements, communications backup, backup power, improved valve shutoff capability, increased ground-level inspections, and continuous video surveillance of the Lake Oahe valve sites (see Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions). Alternative 4 also includes the following additional easement conditions:

- To confirm there is no contamination of aquatic habitats from an undetected pipeline release at the Lake Oahe crossing, Dakota Access shall conduct biannual visual surveys, surface water sampling, and sediment and/or BMI sampling at the Lake Oahe crossing to monitor for the presence of petroleum-based hydrocarbons (specifically GROs/DROs). A lake-bottom visual survey using an underwater video camera or sonar shall be conducted along the entire length of the pipeline centerline across Lake Oahe. At least three surface water and sediment/BMI samples each shall be taken along the pipeline centerline from areas identified as having a greater potential for transmitting oil, such as from where the underlying clay layer is not as thick or from nearshore areas. Sediment/BMI samples would be analyzed for petroleum-based hydrocarbons. Sampling and surveys shall be performed immediately following ice breakup in the spring and in the fall prior to the lake freezing over. Any confirmed detections in hydrocarbon levels that exceed NDDEQ Tier 1 RBSLs (as set forth in the most recently published NDRBCA guidance document and based on the development of appropriate site-specific sediment standards) or a confirmed detection of visible oil will prompt Dakota Access to immediately inspect the pipeline for leaks. Dakota Access shall make sampling results publicly available online, and an annual report summarizing monitoring results shall be provided to the USACE, the NNDEQ, and interested Tribes.
- Should a crude oil release from DAPL at the Lake Oahe crossing occur, Dakota Access shall conduct PAH fish tissue sampling in accordance with sampling protocols that the State of North Dakota utilizes for its monitoring program on the lake for methyl-mercury analysis to support when PAH levels in fish return to pre-release conditions. Fish samples collected for PAH tissue analysis would include all species potentially taken for subsistence by the Tribes. Tissue samples analyzed would align with how fish are typically prepared for consumption in the area; generally, skin-on fillets for scaled fish and skinless fillets for scale-less species. If whole fish are regularly consumed, whole-body samples would be collected. Testing results shall be made publicly available online and shall be provided to the USACE, the NNDEQ, and interested Tribes. If current tissue concentrations have not been assessed, Dakota Access shall collect baseline samples in order to determine when elevated levels of PAHs in fish return to baseline conditions should a crude oil release occur.

With additional monitoring and mitigation measures, the likelihood for moderate to major, short- to long-term direct and indirect impacts from a crude oil release during operation would likely be further reduced relative to Alternative 3. Additional monitoring would help ensure that any level of crude oil release would be quickly identified, including a slow, low-pressure release, subsequently making response and cleanup efforts more effective. Considering the moderate to major impacts combined with the remote to very unlikely likelihood of a WCD release, the overall risk is considered negligible to moderate.

In conclusion, construction and operation impacts on aquatic resources associated with Alternative 4 are not expected to be significant.

Alternative 5

The construction and operation of the North Bismarck Reroute would result in impacts on aquatic resources. The 111-mile-long North Bismarck Reroute would pass through 141 intermittent waterbodies, 8 perennial waterbodies, and 77 NWI mapped wetlands (e.g., palustrine emergent, palustrine forested, and freshwater ponds) that provide habitat to a variety of aquatic species. The effects from construction of the North Bismarck Reroute would include temporary habitat disturbance and a temporary increase in stress and mortality of aquatic organisms during installation of the pipeline through waterbodies and wetlands. The 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of permanent impacts totaling approximately 1.1 acres of habitat loss, although the mainline valves would likely be located in upland areas to avoid wetland and waterbody impacts. State and federal permitting mitigation requirements would reduce the duration and intensity of the impacts. The resulting impacts on aquatic habitat from the construction of a new segment of pipeline would likely be temporary and minor to moderate.

Operation of a pipeline along the North Bismarck Reroute would present a risk of an inadvertent crude oil release into aquatic habitat, including in the Missouri River farther upstream from the Lake Oahe crossing. In the event of a WCD crude oil release, the indirect impacts on aquatic habitat in both unmitigated and mitigated scenarios would be minor to major intensity, but remote to very unlikely to occur, resulting in negligible to moderate risk.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via trucking and/or rail discussed below.

The USACE assumes that abandonment would not involve pipeline removal, and that ground disturbance would be limited to activities to cut and cap the buried pipe at various points along the abandoned portion of the line. Stormwater runoff from disturbed ground could result in temporary to short-term and minor increases in turbidity and sedimentation in any adjacent aquatic habitat; however, state and federal permitting requirements would minimize impacts.

The use of trucking and/or rail to transport the crude oil during construction of the North Bismarck Reroute would not involve additional construction activities in aquatic habitat. However, a short-term increase in the number of trucks and/or trains carrying crude oil would increase the risk of an inadvertent crude oil release into aquatic habitat where roads and railroads cross or run adjacent to waterbodies. As noted in Section 3.1, Reliability and Safety, and Section 3.9, Transportation and Traffic, road and rail tend to have more frequent albeit smaller releases of hazardous materials than pipelines, which would be easier to clean up and remediate. Nonetheless, these releases would have adverse effects on aquatic resources. The comparatively smaller release sizes generally result in a smaller extent of contamination, which is easier to remediate and present a lower risk of species mortality. As a result, the indirect impacts from a crude oil release from trucking and/or rail transport on aquatic habitat would be short- to long-term and minor to moderate. Based on the relatively high likelihood of occurrence and the level of impacts stated above, trucking and/or rail would create a moderate risk from a crude oil release.

In conclusion, construction and operation impacts for Alternative 5 would not result in significant impacts on aquatic resources based on the level, duration, and risk of impacts discussed above.

Alternative 5 would include abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on aquatic resources for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on aquatic resources for Alternatives 5 and 2 would not be significant.

3.5.3. Federally Protected Wildlife Species

Section 9 of the ESA prohibits the take of endangered fish and wildlife species, where take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct (16 USC § 1538). It also prohibits the removal, possession, damage, or destruction of endangered plant species from areas under federal jurisdiction (see Section 3.4.3, [Vegetation and Noxious Weeds] Federally Listed, Candidate, and Proposed Plant Species). Threatened species are either given equal protections to those of endangered species, or more refined protections established as a 4(d) rule under Section 4(d). Exemptions may be requested for Section 9 prohibitions under Section 10, as determined through consultation with the USFWS and National Oceanic and Atmospheric Administration Fisheries. Dakota Access would be liable for any violations of Section 9 of the ESA; penalties are established in 16 USC § 1540.

Section 7 of the ESA requires federal agencies to ensure that any actions authorized, funded, or carried out by the agencies do not jeopardize the continued existence of a federally listed threatened or endangered species, or result in the destruction or adverse modification of designated critical habitat for a federally listed species (16 USC § 1536). The decision of whether to grant an easement for the Project to cross federal lands at Lake Oahe triggered the consultation requirements of Section 7 of the ESA. The 2016 EA described the potential impacts of the Project's Lake Oahe crossing on federally listed species; these impacts were also detailed in the Project's Biological Assessment (BA) that was submitted to the USFWS on March 28, 2016 (USACE, 2016b). The USACE completed Section 7 consultation with receipt of the USFWS Biological Opinions (BOs) on May 2 and May 31, 2016 (USFWS, 2016a). No new species or critical habitats have been listed, designated, or proposed that could be affected by the Applicant

Proposed Action. However, the USACE is reinitiating informal consultation because of new information that the action may affect listed species in a manner not previously considered (see Section 3.5.3.2, [Federally Protected Species] Current Affected Environment). Additional consultation would be needed for Alternatives 1, 2, 4, or 5 if they should be selected (see discussion in Section 3.5.3.3, [Federally Protected Species] Impacts and Mitigation).

The bald eagle was removed from the federal list of threatened and endangered species on August 9, 2007, and is no longer protected under the ESA. However, the bald eagle and golden eagle are protected under the MBTA and the BGEPA, which prohibits disturbance of eagles and other raptors. The BGEPA makes it unlawful, among other things, to take, at any time or any manner, any bald or golden eagle, alive or dead, or any part, nest, or egg thereof without a permit. “Take” includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb (16 USC § 668c; 50 CFR § 22.3). Since delisting of the bald eagle under the ESA in 2007, bald eagles are now protected only by the BGEPA and the MBTA. Section 3.5.3, Federally Protected Species, describes bald and golden eagles and potential Project related impacts. Dakota Access would be liable for any violations of the BGEPA; penalties are established in 16 USC § 703.

In order to ensure compliance with these acts, Dakota Access obtained USFWS and state agency data in February 2021 regarding known eagle nests in the vicinity of the Lake Oahe crossing from North Dakota Game and Fish, which houses the eagle location database (USFWS, 2016a). Two unoccupied bald eagle nests were identified 0.4 and 1.4 miles from the HDD entry area by North Dakota Game and Fish. As both of these nests are abandoned and in poor condition, it is unlikely that either nest is currently being used by any bald eagles (NDGF, 2021).

A survey conducted by the SRST in 2021 identified 6 bald eagles and 12 golden eagles within their study area stretching from the Lake Oahe crossing to 21.3 miles downstream. The Tribe’s data indicate that nesting and foraging habitat for the eagles is present throughout the Lake Oahe and Missouri River study area, particularly at the Cannonball River confluence and the sandstone outcrops and rocky bluffs in the area.

This section provides an analysis of the affected area, impacts, and mitigation from the past and future Project activities on federally protected species under Alternatives 1 through 5. The analysis identifies whether the Project would have no effect on federally listed species, *may affect but is not likely to adversely affect* federally listed species, or is *likely to adversely affect* federally listed species. Impacts that *may affect, but are not likely to adversely affect* a species are those that involve impacts that are either beneficial, not considered significant under the ESA (i.e., not measurable or detectable and would not rise to the level of take), or are discountable (i.e., impacts are extremely unlikely to occur) (USFWS and NMFS, 1998; USFWS, 2019a). An impact would be considered significant for the purpose of this analysis if it has an adverse effect on a federally listed species. Significant impacts on bald and golden eagles would include impacts that would cause the abandonment or destruction of an active bald or golden eagle nest and require a take permit.

3.5.3.1. Project Background: Affected Environment and Impacts

The Project was installed on USACE property at the Lake Oahe crossing in 2017. The design, construction plans, and mitigation were consistent with what was proposed in the 2016 EA. The affected area for the Project background includes the federally protected species and their habitats that had the potential to be present at the time of Project construction in 2017 within the Project Area.

Federally Listed, Candidate, and Proposed Species

The 2016 EA identified nine federally listed species and one designated critical habitat with the potential to occur in the affected area (see Table 3.5.3-1). No proposed or candidate species or proposed critical habitat were identified in the Project Area. Additionally, there is no anticipated or recorded take of any listed species, so no significant impacts occurred during past Project construction or operation. Species descriptions are provided below.

Table 3.5.3-1: Federally Listed Species with Potential to Occur within the Project Area

Species	Status	Morton County	Emmons County	Impact Determination
Interior least tern [a] *(Sterna antillarum athalassos)*	Endangered [a]	X	X	May Affect, Not Likely to Adversely Affect
Piping plover [b] *(Charadrius melodus)*	Threatened	X	X	May Affect, Not Likely to Adversely Affect
Rufa red knot *(Calidris canutus rufa)*	Threatened	X	X	May Affect, Not Likely to Adversely Affect
Whooping crane *(Grus Americana)*	Endangered	X	X	May Affect, Not Likely to Adversely Affect
Black-footed ferret *(Mustela nigripes)*	Endangered	X		No Effect
Gray wolf *(Canis lupus)*	Endangered	X		No Effect
Northern long-eared bat *(Myotis septentrionalis)*	Endangered [c]	X	X	No Effect
Dakota skipper *(Hesperia dacotae)*	Threatened	X	X	No Effect
Pallid sturgeon [d] (*Scaphirhynchus albus*)	Endangered	X	X	May Affect, Not Likely to Adversely Affect
Monarch Butterfly (*Danaus plexippus*)	Candidate	X	X	May Affect, Not Likely to Adversely Affect
Tricolored Bat [e] (*Perimyotis subflavus*)	Proposed Endangered			No Effect

Source: USFWS, 2023a

[a] The interior least tern was delisted in February 2021, but was still listed when the pipeline was installed and during the first 4 years of operation.
[b] Designated critical habitat for the piping plover occurs in the affected area.
[c] This species has been reclassified from threatened to endangered effective March 31, 2023.
[d] This species was identified less than 50 miles downstream of the Lake Oahe Crossing and could be affected by inadvertent releases.
[e] This species was included based on a recommendation from USFWS during consultation, although it did not appear in the Information for Planning and Consultation (IPaC) search (USWFW, 2023a) or other resources and was not identified in any surveys. As such, the tricolored bat is not discussed further in this EIS.

Interior Least Tern

The interior least tern (*Sterna antillarum athalassos*) is a small shorebird with a white body and neck, a black head, and a yellow beak. In North Dakota, the interior least tern inhabits sparsely vegetated sandbars near waterbodies along the Yellowstone and Missouri rivers from areas upstream of Lake Sakakawea to Lake Oahe. These sandbars are used for nesting and foraging habitat. The majority of the interior least tern diet is comprised of small fish species. Approximately 100 pairs of interior least tern breed in North Dakota during the summer before migrating south to the Caribbean along with Central and South America. Primary threats to the interior least tern are habitat loss and anthropogenic disturbance (USFWS, 2020a).

Suitable habitat may exist for interior least terns at the Lake Oahe crossing depending on precipitation and seasonal flow variations as exposed sand/gravel bars suitable for nesting may be present. Dakota Access crossed Lake Oahe utilizing the HDD construction method. Pipeline installation via HDD avoided in-stream disturbance that would otherwise occur if the pipe was installed via the traditional open-cut method.

Potential sources for indirect impacts on interior least terns include the inadvertent release of non-toxic bentonite mud (used for lubricating the drill path) into the waterbody or nesting habitat and noise associated with the drilling equipment. This did not occur; therefore, there were no impacts from an inadvertent release of bentonite mud during construction.

Operation of the HDD equipment resulted in a temporary increase in noise in the immediate vicinity of the HDD activities. Although the HDD sites are located more than 960 feet from any suitable interior least tern habitat, it is possible that the activities were audible if interior least terns were nesting in the area. However, Atwood et al. (1977 as cited in USACE, 2016a) found that noise associated with human activities (an airfield in the case of the referenced study) did not affect site fidelity or nesting success of least terns. Similarly, Hillman et al. (2015 as cited in USACE, 2016a) found that noise from military and civilian overflights did not impact nest success and that restricting human disturbance to greater than 50 meters (164 feet) from colony boundaries mitigated impacts on nesting birds. Noise associated with aircraft overflights at low altitudes in the Hillman et al. (2015 as cited in USACE, 2016a) study were a minimum of 67.7 decibels of the A-weighted scale (dBA), greater than the anticipated sound levels generated by HDD equipment. Noise studies conducted at the proposed HDD locations indicate that sound levels were to be less than 60 dBA at approximately 600 feet from the equipment. Therefore, impacts from noise associated with the HDD crossing of Lake Oahe would not result in take.

No water withdrawal from or access to Lake Oahe was required to complete the Lake Oahe crossing, so there were no impacts from entrainment or impingement of small fish species that the interior least tern preys upon.

Based on the avoidance and minimization measures, literature review, field investigations, and habitat types present in the proposed Project Area, the determination for the Project was that it *may affect, but is not likely to adversely affect* the interior least tern.

No maintenance activities took place in suitable interior least tern habitat, and no releases or maintenance activities took place on federal land during nearly 6 years of operation; therefore, Project operation has had *no effect* on the species.

Piping Plover

The piping plover (*Chardrius melodus*) is a small shore bird that utilizes near shore habitat such as sandbars and alkali wetlands in the Great Plains, Great Lakes, and Atlantic coast for nesting, foraging, sheltering, brood-rearing, and dispersal. Federally designated piping plover critical habitat is located along the Missouri River System (on islands and along the shoreline) throughout North Dakota. Main threats to the piping plover are habitat loss and anthropogenic disturbance (USFWS, 2019b).

Piping plovers have been observed on the semi-permanent island in Lake Oahe at the crossing location, as well as just upstream on an exposed sandbar during lower-flow years (USACE, 2021b). Potential sources for indirect impacts on piping plovers included the inadvertent release of non-toxic bentonite mud (used for lubricating the drill path) into the waterbody or nesting habitat. This did not occur; therefore, there were no impacts from an inadvertent release of bentonite mud during construction.

Operation of the HDD equipment resulted in a temporary increase in noise in the immediate vicinity of the HDD activities. Although the HDD entry and exit sites are located more than 960 feet from any suitable piping plover habitat, it is possible that the activities were audible if piping plovers were nesting in the area. However, piping plovers are frequently observed nesting in and around active sand and gravel mines and do not appear to be deterred by elevated noise levels associated with the operation of equipment (Marcus et al., 2008, Brown et al., 2013 as cited in USACE, 2016a).

Due to the similarity in life history and habitat requirements, impacts on piping plovers would be similar to those discussed above for the interior least tern. The island immediately south of the crossing location provides suitable nesting habitat. In addition, suitable habitat may exist for piping plovers along the shoreline at and downstream from the Lake Oahe crossing depending on precipitation and seasonal flow variations, as exposed sand/gravel bars suitable for nesting can be present at lower flows. These areas are also designated as critical habitat for this species under the ESA. Dakota Access crossed Lake Oahe utilizing the HDD construction method. Pipeline installation via HDD avoided in-stream disturbance that would otherwise occur if the pipe was installed via the open-cut method, and Dakota Access implemented a number of conservation measures to avoid adverse impacts (USFWS, 2016a). Based on this assessment and the avoidance and minimization measures, literature review, field investigations, and habitat types present in the Project Area, the determination for the Project was that it *may affect, but is not likely to adversely affect* the piping plover or its critical habitat. In addition, no releases or maintenance activities took place on federal land during nearly 6 years of operation; therefore, Project operation has had *no effect* on the species.

Rufa Red Knot

The rufa red knot (*Calidris canutus rufa*) is a large sandpiper like shorebird known for its long-distance migration between its summer breeding grounds in the Arctic and wintering areas at high latitudes in the southern hemisphere. Some rufa red knots winter on the coast of Gulf of Mexico and migrate through the interior of North America in the spring and fall, utilizing stopover habitat in the Northern Great Plains. This species utilizes the Atlantic, Mississippi, and Central Flyways (USFWS, 2014a). Rufa red knots are typically found along aquatic habitats along their migratory route, preferring sandy coastal habitat such as near tidal inlets of the mouths of bays and estuaries and sandbars or sandy shores of large rivers and reservoirs along the interior of North America. Some rufa red knots also heavily rely on exposed substrate at wetland edges for stopover habitat depending on water levels that vary annually (Gratto-Trevor et al., 2001 as cited in USACE, 2016a).

Rufa red knots do not nest in the Project Area and only occur as an occasional migrant. During spring and fall migrations, the rufa red knot has the potential to occur in North Dakota. Migrating rufa red knot would likely only occur at migratory stopover habitat (suitable shoreline and sandy beach habitat along major rivers, streams, waterbodies, and wetlands) for a brief amount of time (24 hours or less). The results of the habitat assessment field surveys indicate that potentially suitable stopover habitat (sandbar and beach habitats) for migrating rufa red knots is present at the Lake Oahe crossing. Lake Oahe was crossed using the HDD construction method, and thus avoided direct impacts on potentially suitable rufa red knot stopover habitat. While direct impacts on the rufa red knot habitat at Lake Oahe were avoided through the HDD construction method, noise associated with the HDD may have deterred rufa red knot migration through the area. These individuals may have had to travel to other suitable stopover habitat in the area (e.g., upstream or downstream of the affected area). As such, construction activities *may have affected, but are not likely to have adversely affected* the rufa red knot.

Inadvertent release of drilling mud did not occur during construction; therefore, there were no impacts from an inadvertent release of bentonite mud during construction.

No operational activities occurred in the Project Area during the first few years of operation; therefore, Project operation has had *no effect* on the species.

Whooping Crane

Whooping cranes (*Grus americana)* are large crane with long black legs, a white body, and a black and red head. In North Dakota, the whooping crane migrate biannually in the spring and fall along the Central Flyway from the Gulf Coast of Texas to Alberta, Canada, with stopover habitat and nesting habitat scattered along the way. During migration, whooping cranes utilize stopover habitat in shallow marshes for roosting and harvested grain fields for foraging. Whooping cranes mainly prey upon insects, rodents, minnows, berries, and crustaceans. The primary threats to whooping cranes are habitat loss, human disturbance, and collisions with powerlines (USFWS, 2019c).

In North Dakota, whooping cranes are only present during the twice-yearly migration between winter grounds and summer nesting sites. As the whooping crane is a migrant and does not breed in North Dakota, the species cannot be confirmed as present in or absent from the Project Area. The results of the habitat assessment field surveys indicate that the Project Area may contain suitable stopover habitat (i.e., crop fields and rangeland). It was anticipated that whooping cranes would avoid the Project Area during active construction, as they tend to avoid areas with human disturbance (Howe, 1989, USFWS, 1994, Lewis and Slack, 2008 as cited in USACE, 2016a). The noise disturbance from construction activities during the migration periods could have caused birds to choose more suitable landing and overnight roosting locations away from construction activities given the abundance of similar habitat throughout the migration corridor in North Dakota and in the general vicinity near Project Area.

The presence of construction activities within potentially suitable stopover habitat during migration could have disturbed whooping cranes in the area or caused flying whooping cranes to avoid the area and select other suitable stopover habitat. While there was potential for individuals to land in the Project Area during construction, work was to halt if a whooping crane was observed within the Project Area and not resume until the bird left. Additionally, Dakota Access was to notify the USACE and USFWS of the observation. No whooping cranes were reported during construction. As illustrated on Figure 16 of the 2016 EA, the Project Area represents a minute fraction of the whooping crane migration corridor in North Dakota. Due to the abundance of available stopover habitat along the North Dakota migration corridor and in the vicinity of the Project Area (USFWS, 2009a as cited in USACE, 2016a), impacts would not result in take. Therefore, the determination for the Project was that it *may affect, but is not likely to adversely affect whooping crane*. In addition, no releases or maintenance activities took place on federal land during nearly 6 years of operation; therefore, Project operation has had *no effect* on the species.

Black-footed Ferret

The black-footed ferret (*Mustela nigripes*) is a small mammal and member of the Mustelidae family that inhabit shortgrass and mixed grass prairies of North America. The black-footed ferret diet is mainly comprised of prairie dogs, resulting in the species being almost exclusively found where large complexes of prairie dog towns are present. Black-footed ferrets are nocturnal and spend most of their time underground in prairie dog burrows, leaving only to hunt. The main threats to the black-footed ferret are prairie dog population decline and disease. Due to this species being extirpated in the wild, it has been reintroduced in 21 sites in Wyoming, Montana, South Dakota, Colorado, Utah, Kansas, New Mexico, and Arizona since 1991 (BFFRIT, 2011; USDA, 2011).

No suitable black-footed ferret habitat is present in the Project Area. The black-footed ferret has been recorded in Morton County; however, based on National Heritage Inventory (NHI) data received from North Dakota Natural Heritage Program, there are no documented occurrences within the vicinity of the Project (Dirk, 2020). Further, it is believed that black-footed ferrets have been extirpated from North Dakota, and no reintroductions have occurred in the state (USFWS, 2013f, North Dakota Game and Fish, 2012 as cited in USACE, 2016a). Due to the lack of suitable habitat and the distance of the Project Area from known black-footed ferret occurrences, the Project would have had *no effect* on black-footed ferrets.

Gray Wolf

The gray wolf (*Canis lupus*) historically occupied most habitat types across North America, showing little preference for one land cover type over another (Mech, 1974). Once thought to require remote wilderness areas with little to no human disturbance, recent range expansion has demonstrated the gray wolf's ability to acclimate to higher rates of anthropogenic development and disturbance than previously thought. Given abundant prey and low rates of human-caused mortality, wolves can survive in proximity to human dominated environments (Fuller, 1989).

Although the gray wolf is listed as endangered in both counties of the Project Area, North Dakota does not currently have an established breeding population of the gray wolf (North Dakota Department of Agriculture, 2014b as cited in USACE, 2016a). As such, the Project has had *no effect* on this species.

Northern Long-Eared Bat

The northern long-eared bat (*Myotis septentrionalis*) is a medium-sized bat with long ears, dark brown fur on its back, and pale brown fur on its underside. It inhabits cavities, abandoned mines, and crevices throughout the winter, and inhabits hollows and the bark of dead trees with a diameter at breast of height of at least 3 inches throughout the summer. Less frequently, northern long-eared bats have been observed roosting in man-made structures such as sheds or barns. It is present in the eastern and north-central United States, although historically it is less common in the western portion of its range than in the northern portion. This species roosts both individually and in colonies. The northern long-eared bat's diet mainly consists of insects and forages at dusk in forests, forest clearings, and over water. Main threats to the northern long-eared bat are white-nose syndrome, anthropogenic disturbance, and habitat loss (USFWS, 2020c).

Suitable roosting habitat for the species is known to include woodlands and forests at least 10 acres in size (USFWS, 2014b). Where isolated trees are greater than 1,000 feet from the nearest hedgerow or woodlot, they have not been considered suitable roosting habitat (USFWS, 2014b). Foraging habitat can extend along wooded riparian corridors and any other wooded corridors that connect to suitable roosting habitat within 1.5 miles (USFWS, 2014b) and substantial water resources (i.e., streams and ponds) within 100 meters (328 feet) of wooded foraging and/or roosting habitat. It is possible that because the majority of North Dakota has limited tree cover, bats may be using riparian corridors as more diverse roosting and foraging habitat or they may be using these riparian corridors for movement between local foraging grounds or as corridors for seasonal migrations (Barnhart and Gillam, 2016).

At the time of the 2016 EA, BA, and BOs, the Project Area was outside of the northern long-eared white-nose syndrome (WNS) zone at the Lake Oahe crossing. Incidental take from activities outside of the WNS zone were exempted under the species 4(d) rule. The 4(d) rule for this species is not applicable as of March 31, 2023, when USFWS changed the northern long-eared bat's listing from threatened to endangered. In addition, there were no documented maternity roosts or hibernacula near the HDD sites. A statewide survey of bat species identified suitable habitat for northern long-eared bat as occurring in large riparian woodland complexes, which is consistent with typical known habitat for the species. No large riparian woodland complexes occur in the affected area (Nelson et al., 2015). The lack of apparent suitable habitat is supported by the NHI data received from the North Dakota Natural Heritage Program, showing that no element occurrences of the northern long-eared bat are present within or near the Project Area (Dirk, 2020).

Therefore, due to the distance from any suitable habitat or known occurrences, the Project has had *no effect* on the northern long-eared bat at the Lake Oahe crossing.

Dakota Skipper

The Dakota skipper (*Hesperia dacotae*) is a small butterfly and habitat specialist that inhabits high-quality, dry-mesic, and wet-mesic tallgrass and mesic mixed grass prairie with alkaline and composite soils. Only 146 populations have been documented in two Canadian provinces and three U.S. states (McCabe, 1981; Royer and Marrone, 1992 as cited in USACE, 2016a; Cochrane and Delphey, 2002; USFWS, 2013 as cited in USACE, 2016a). Remaining populations vary in size and density and for the most part are not influenced by dispersal between populations (McCabe, 1981; Dana, 1991, 1997; Cochrane and Delphey, 2002). The Dakota skipper spends winter in the soil at the grasses in sites that they inhabit. The current status of the Dakota skipper in the state is considered tenuous, and most populations are considered vulnerable due to their extremely isolated nature.

There is no suitable Dakota skipper habitat within the Project Area at the Lake Oahe crossing based on species occurrence, grassland analysis, and occupancy surveys. A recent survey conducted by the SRST did not identify any suitable Dakota skipper habitat or species presence within the Project Area (SRST, 2021). As such, the Project has had *no effect* on this species.

Pallid Sturgeon

The pallid sturgeon (*Scaphirhynchus albus*) is a ray-finned fish that is endemic to the Missouri River and is associated with swift waters of large turbid, free-flowing rivers with braided channels, dynamic flow patterns, periodic flooding of terrestrial habitats, and extensive microhabitat diversity. The pallid sturgeon has been documented as far north as Fort Peck Dam in Montana to the headwaters of Lake Oahe (USFWS, 2014c). Pallid sturgeon populations are fragmented by dams on the Missouri River and are historically scarce in the Lake Oahe portion of the Missouri River; however, pallid sturgeon has been historically documented in the Cannonball River past the confluence with the Missouri River, so there could be an active population within the Project vicinity; USFWS notes that pallid sturgeon have not been collected in this stretch of the Missouri River in 15 years.

Suitable habitat for the pallid sturgeon occurs at the Lake Oahe crossing, although no populations of this species have been recorded recently in the area. Impacts on suitable habitat during construction was avoided by crossing Lake Oahe using an HDD. Pipeline installation via HDD avoided in-stream disturbance that would otherwise occur if the pipe was installed via the traditional open-cut method. Therefore, construction of the Project would have had *no effect* on the pallid sturgeon.

The only source of indirect impacts on pallid sturgeon associated with the HDDs would have been an inadvertent release of non-toxic bentonite mud into the waterbody. This did not occur; therefore, there were no impacts from an inadvertent release of bentonite mud during construction.

No water withdrawal from or access to Lake Oahe was required to complete the Lake Oahe crossing. As such, there were no impacts from impingement or entrainment on the pallid sturgeon.

No releases or maintenance activities took place on federal land during the nearly 6 years of operation; therefore, Project operation has had *no effect* on the species.

Monarch Butterfly

The monarch butterfly is a large butterfly that inhabits herbaceous habitats and relies on flowering plants for breeding and laying eggs. In general, habitat requirements for monarch populations include specific quantities and optimal quality of milkweed and breeding season nectar sources; however, the specific optimal amount of habitat and its spatial distribution are unknown (USFWS, 2020d).

Two North American populations of monarch butterfly, including migratory populations east and west of the Rocky Mountains, have been monitored at their overwintering sites since the mid-1990s. Monarch butterflies found east of the Rocky Mountains, including breeding populations found in North Dakota, migrate south or southwest to mountainous overwintering grounds in central Mexico (NDGF, 2019b). While populations normally fluctuate from year to year, data indicates population declines over the last 2 decades (USFWS, 2020d). Threats associated with these declines include habitat loss, habitat fragmentation, pesticide use on milkweed (*Asclepias* spp.) host plants, and changing climate (USFWS, 2023b).

Suitable habitat for the monarch butterfly was identified by a recent survey conducted by the SRST within the Project Area (SRST, 2021). This survey identified the presence of wooley milkweed (*Asclepias lanuginosa*) and common milkweed (*Asclepias syriaca*) species that monarch butterflies would use for breeding. A large amount of suitable habitat containing these species is located outside of the area that was disturbed during construction. As such, construction of the Project resulted in a *may affect but is not likely to adversely affect* determination for the monarch butterfly due to loss of suitable habitat and potential loss of milkweed host plants. No releases or maintenance activities took place on federal land during the nearly 6 years of operation; therefore, Project operation has had *no effect* on the species.

Conclusion

In conclusion, past construction and operation impacts on federally listed species has not had a significant effect on any federally listed species given the *no effect* and/or *may affect, but is not likely to adversely affect* determinations for each species.

Bald and Golden Eagles

The bald eagle and golden eagle are large raptors found throughout the continental United States and Canada. They are protected under BGEPA and the MBTA, which prohibit disturbance of eagles and other raptors. Additionally, bald and golden eagles are considered Species of Special (or Tribal) Concern under the SRST's Tribal Law (Tribal Code of Justice [TCJ] Title IX: 2: 9-201[72]). Species of Special (or Tribal) Concern are critical to the cultural and religious practices of the Tribe and are afforded protection from take within the SRST's borders (SRST, 2008). Bald and golden eagles are considered "trust resources" due to an agreement between the SRST and U.S. government. These species are afforded additional protections as part of USACE's trust responsibility and include the requirement of compensation for the destruction of the trust resource.

They inhabit wooded areas near coasts, lakes, marshes, and other open waterbodies. The bald eagle's diet consists mostly of waterfowl, fish, and small mammals such as squirrels and raccoons, but they also scavenge carrion. Based on known nest data, there are no eagle nests within the recommended nest buffers listed in the USFWS *National Bald Eagle Management Guidelines* (USFWS, 2007); these nest buffers include 660 feet for linear construction activities if the activity would be visible from the nest, and 330 feet if the activity would not be visible from the nest (USFWS, 2007). These guidelines are intended to help the public minimize impacts on bald eagles, particularly where they may constitute "disturbance," which is prohibited by the BGEPA. The Project Area was over 1,000 feet from known or historic eagle nesting areas at the time of construction.

Given the distance from known eagle nesting areas and use of the HDD method for the Lake Oahe crossing, past activities had no effect on bald and golden eagles.

3.5.3.2. Current Affected Environment

Information on federally protected species was reviewed in order to identify changes in species listings, documented occurrences, or other information that has changed since the 2016 EA. A desktop analysis and review of Project details was also completed to determine if there have been any changes to potential habitat.

The USFWS IPaC online tool was reviewed for the Project Area in December 2020 to determine if any new federally listed, candidate, or proposed species occur in the Project Area; no new species were identified by IPaC (USFWS, 2021). The interior least tern was delisted in 2021; as such, the species is not covered under the ESA for future impacts. The northern long-eared bat has been reclassified as endangered, effective March 31, 2023 (USFWS, 2023a).

SRST surveys conducted in 2021 observed eight interior least terns and six piping plovers at survey points along Lake Oahe, including at the confluence of the Cannonball River and Lake Oahe (SRST, 2021). A piping plover nest was observed on a small island 20.2 miles downstream from the Lake Oahe crossing (SRST, 2021).

Furthermore, bat acoustic surveys conducted during the 2021 SRST surveys made 39 detections of northern long-eared bats in the same area (SRST, 2021). These results indicate that the survey area supports northern long-eared bats in some capacity despite the absence of large woodlands. The findings are consistent with Barnhart and Gillam (2016), who found northern long-eared bats at the periphery of their range in North Dakota in wooded riparian areas consisting of a mosaic of woodlands, shrublands, and grasslands. Similar habitat exists in the riparian areas along tributaries to the Cannonball River in the SRST 2021 survey area. Woodlands in the area primarily include cottonwood trees (*Populus deltoids*) (SRST, 2021). Barnhart and Gillam (2016) suggest that northern long-eared bats are using riparian corridors dominated by *Populus* spp. to move to more diverse roosting and foraging habitat, but that further research is needed to fully determine how the species is using these habitats. Local resources could provide foraging habitat for northern long-eared bats; insects associated with the Cannonball River and Lake Oahe for part of their life cycle as BMIs, such as flies, could provide an abundant food source to the species (SRST, 2021). The SRST 2021 survey report also notes that sandstone cliffs with intermittent crevasses occur in the general area that may provide adequate hibernacula and resting habitats for the northern long-eared bat, although no hibernacula have been confirmed in the area (Dirk, 2020).

The Project is now located within the northern long-eared bat WNS zone (USFWS, 2020b). The occurrence in the WNS zone increases the species' protections under the ESA through the 4(d) rule, which includes timing and tree-removal restrictions near documented maternity roosts and hibernacula, but the 4(d) rule will no longer be effective once the bat's endangered reclassification becomes effective on March 31, 2023. Regardless, based on current NHI data, there are no documented maternity roosts or hibernacula near the former HDD entry and exit points (Dirk, 2020).

An occupancy survey conducted by the USFWS narrowed Dakota skipper historic and current occurrence through 2017 to the township level in North Dakota. The Dakota skipper is present within a township that the existing pipeline crosses based on recent survey data from the USFWS (USFWS, 2018a). This township is located approximately 2 miles east of the Lake Oahe crossing. The North Bismarck Reroute does not cross any of the identified Dakota skipper townships (USFWS, 2018a).

No changes in the proximity of known bald and golden eagle nests have occurred since the 2016 EA; the Project Area more than 1,000 feet from known or historic eagle nesting areas (NDGF, 2021). Six bald eagles and twelve golden eagles were observed during the 2021 SRST surveys, along Lake Oahe, including at the confluence of the Cannonball River and Lake Oahe, although nests were not reported (SRST, 2021). The numbers of eagles observed during the breeding season indicate additional nests could occur in close proximity to the Project Area.

3.5.3.3. Impacts and Mitigation

The subsequent sections assess impacts on federally protected species anticipated as a result of future Project activities under each of the five proposed alternatives.

Federally Listed, Candidate, and Proposed Species

The following discussion assesses impacts on federally listed species and designated critical habitat related to each of the five proposed alternatives. No proposed critical habitat or candidate or proposed species occur in the affected area. Future activities from Alternatives 1 through 4 would have *no effect* on the black-footed ferret, gray wolf, and Dakota skipper, as they do not have suitable habitat and/or do not occur within the affected area. Alternative 5 would have no effect on the black-footed ferret as this species does not have suitable habitat and/or does not occur within the affected area for this alternative, which is different than the affected area for Alternatives 1 through 4. Other listed species and designated critical habitat could be affected, as described below.

As noted in Section 3.5.3, Federally Protected Wildlife Species, the USACE is reinitiating informal consultation for Alternative 3 due to new information that Alternative 3 may affect listed species in a manner not previously considered. Additional consultation would be needed for Alternatives 1, 2, 4, or 5 should any of them be selected because they involve new activities that were not planned during the original Section 7 consultation for the Project, and these Alternatives would involve effects on federally listed species. The USACE would consult with the USFWS as needed to fulfill its obligations under Section 7 of the ESA.

Alternative 1

Alternative 1 would involve abandonment by pipe removal. Pipe removal would require excavation of the bottom of Lake Oahe, as discussed above in Section 3.5.1.3, [Wildlife] Impacts and Mitigation, and Section 3.5.2.3, [Aquatic Resources] Impacts and Mitigation. These activities could affect piping plover, rufa red knot, whooping crane, monarch butterfly, and northern long-eared bat, as described below. As construction activities necessary for Alternative 1 would be more impactful than the HDD construction, and the ESA determinations for these activities would change, new Section 7 consultation with the USFWS would be required.

There would be no operation associated with Alternative 1, and so there would be no operational impacts on federally listed species, including no risk of a crude oil release from federal property.

Piping Plover

Impacts from this action would be similar to what is described above in Alternative 1 in Section 3.5.1.3, [Wildlife] Impacts and Mitigation, and would likely affect piping plover through displacement of individual birds. Displacement during the nesting season could result in abandonment of young or eggs. Excavation and indirect effects from the cofferdams in Lake Oahe could also damage piping plover sandbar and mudflats in critical habitat in the affected area, including the island south of the crossing likely to support nesting piping plovers. Therefore, Alternative 1 is *likely to adversely affect* piping plover and piping plover critical habitat, resulting in short-term to permanent, major impacts.

Rufa Red Knot and Whooping Crane

Noise disturbance from pipe removal abandonment activities could affect rufa red knot and whooping crane individuals by startling them and causing dispersal should activities occur during the migration season. As for noise disturbances described for Alternative 1, the impact *may affect, but is not likely to adversely affect* the rufa red knot and whooping crane, resulting in long-term, minor impacts.

Northern Long-Eared Bat

Based on the results of recent surveys (SRST, 2021), roosting, foraging, and/or migrating northern long-eared bats could occur in wooded riparian corridors adjacent to the Cannonball River and Lake Oahe and be affected from the noise and lighting disturbance that would occur due to pipe removal activities during abandonment. This disturbance could wake the bats from daily torpor leading to energy costs, reductions in water conservation, reduced reproduction and growth, and increased exposure to predators (Geiser, 2020). Additionally, excavation operations, which may include dredging, in Lake Oahe could affect insect prey species by causing mortality of the insect larvae due to increased turbidity or injury from equipment. Impacts would likely be moderate and long-term given the limited habitat in the area, which could limit the ability of northern long-eared bats to disperse and move away from the disturbance or find other prey.

On November 29, 2022, the USFWS announced a final rule to reclassify the northern long-eared bat as endangered under the ESA. The final rule took effect on March 31, 2023, and the northern long-eared bat is now listed as endangered and the 4(d) rule is no longer applicable.

Therefore, due to presence of the species and habitat disturbance from Project activities, Alternative 1 of the Project *may affect and is likely to adversely affect* the northern long-eared bat due to potential impacts on their habitat, noise and lighting disturbances, and a reduction of prey abundance.

Monarch Butterfly

Based on recent surveys (SRST, 2021), two different milkweed species were identified within the Project Area and in the surrounding habitats. Monarch butterflies along with their eggs and caterpillars could be present within these herbaceous habitats with milkweed.

Ground disturbance and spoil storage requiring about 1,400 acres of workspace would impact the monarch butterfly’s grassland habitat and could result in take of the species. Even if constructed outside of the breeding season, loss of milkweed habitat on summer breeding grounds is a primary factor contributing to the decline in monarch populations (NDGF, 2019b). There is plentiful nearby suitable habitat along the shores of Lake Oahe, so migrating or breeding monarchs would likely summer in those habitats until the Project Area is restored and revegetated. Therefore, ground disturbance associated with Alternative 1 *may affect and is likely to adversely affect* the monarch butterfly and its habitat and would result in short-term to long-term and moderate impacts.

Conclusion

In conclusion, abandonment by removal of the pipeline could have a significant impact on two federally listed species (piping plover and northern long-eared bat), one candidate species (monarch butterfly), and one critical habitat (piping plover critical habitat) given the *likely to adversely affect* determination for these species.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on federally listed species. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Pipeline abandonment activities at the HDD sites under Alternative 2 could affect piping plover, rufa red knot, whooping crane, monarch butterfly, and northern long-eared bat, as described below.

There would be no operation of the pipeline under Lake Oahe associated with Alternative 2, and so there would be no operational impacts, including no risk of a crude oil release from federal property.

Piping Plover

Ground disturbance within the former HDD sites on herbaceous land cover would occur during pipe abandonment, where Dakota Access would purge, cut, and cap the pipeline. Impacts would primarily consist of temporary noise disturbance from equipment. Impacts from lighting and noise on the piping plover would be similar to those described above in Section 3.5.3.1, [Federally Protected Species] Project Background: Affected Environment and Impacts, although in this case construction would be limited to daytime hours and would be considerably shorter in duration and less noise intensive. Abandoning the pipe in place is not anticipated to have any long-term or permanent impacts on piping plover or piping plover critical habitat. The pipeline could corrode while being left in place, although the pipe would be flushed of all contaminants and be observed, evaluated, and remediated if any problem conditions occur from leaving the pipe in place. As such, this alternative would have temporary, minor impacts, and *may affect, but is not likely to adversely affect* the piping plover. No critical habitat would be affected.

Rufa Red Knot and Whooping Crane

Impacts on rufus red knot and whooping crane under Alternative 2 would consist of noise and lighting impacts, similar to that described for piping plover above. As with noise and lighting disturbance for pipe installation, the species would likely fly to adjacent habitat farther up-river or down-river as part of their migration. As such, this alternative would have temporary, minor impacts; therefore, Alternative 2 *may affect, but is not likely to adversely affect* the rufa red knot and whooping crane.

Northern Long-Eared Bat

As noted for Alternative 1, recent surveys indicate that roosting, foraging, and/or migrating northern long-eared bats could occur in wooded riparian corridors adjacent to the Cannonball River and Lake Oahe and be affected from the noise and lighting disturbance that would occur due to pipeline abandonment activities (SRST, 2021). Impacts would be lower than the disturbances to daily torpor mentioned above in Alternative 1. Impacts would be temporary and minor based on the limited activities that would occur to cut and cap the pipeline. Therefore, it *may affect, but is not likely to adversely affect* the northern long-eared bat.

Monarch Butterfly

As noted for Alternative 1, recent surveys identified milkweed species that are commonly used by the monarch butterfly for breeding, egg laying, and where its caterpillars begin their instars. Impacts from ground disturbance under Alternative 2 would be lower than disturbances mentioned above in Alternative 1 as work would only occur at the HDD sites impacting 0.7 acre of grassland habitat. While suitable monarch butterfly habitat could occur in this grassland habitat, plentiful suitable habitat is present along the banks of Lake Oahe, and impacts on the butterfly would be temporary and minor. As such, Alternative 2 *may affect, but is not likely to adversely affect* the monarch butterfly and its habitat.

Conclusion

In conclusion, impacts on federally listed species from pipeline abandonment under Alternative 2 would not be significant as the alternative would have *no effect* or *may affect, but is not likely to adversely affect* determinations for each species.

As for Alternative 1, Alternative 2 would likely result in the construction and operation of a pipeline reroute, which may result in indirect effects on federally listed species. Direct and indirect impacts associated with the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5, are described under Alternative 5.

Alternative 3

There would be no additional construction activities associated with Alternative 3. In addition, Dakota Access would not need to routinely maintain its permanent easement in the Project Area because the area is sparsely vegetated and the pipe is deeply buried over most of the Project Area (at least 50 feet belowground on federal property) where it is unlikely to be damaged by tree roots should any trees become established. Therefore, no impacts from maintenance activities would be anticipated. However, an inadvertent crude oil release from the underground pipeline during operation could affect piping plover, rufa red knot, whooping crane, pallid sturgeon, and northern long-eared bat (see below for a species-specific analysis).

The effect metric that poses the greatest risk to the piping plover, rufa red knot, whooping crane, monarch butterfly, and northern long-eared bat from an inadvertent release is the EA-100 for potential acute effects on wildlife. Because the piping plover, rufa red knot, and whooping crane are shorebirds rather waterfowl the EA-100 metric for wildlife is more applicable than the aquatic biota metric. The EA-100 area was modeled as less than 0.04 mi^2 during both mitigated and unmitigated ice-free conditions. In an ice-covered scenario, the ice edge would extend over the shoreline, meaning that no oil would be able to reach the shore and affect these species.

The effect metric that poses the greatest risk to the pallid sturgeon is the EA-100 for aquatic biota assuming average sensitivity species. In the unmitigated scenarios, the range of areas for the EA-100 for aquatic biota assuming average sensitivity species was identified as being less than 0.04 mi^2 to 2.4 mi^2 of water during ice-free conditions and 0.4 to 2.4 mi^2 for ice-covered conditions. Mitigation measures would reduce the dispersal area and therefore the mitigated scenario areas ranged from less than 0.04 to 0.1 mi^2 under ice-free conditions and 1.3 to 2.4 mi^2 for ice-covered conditions. Mobile organisms such as the pallid sturgeon can travel to avoid a dissolved plume of hydrocarbons thereby likely reducing the actual EA-100.

Piping Plover

In the event that a crude oil release occurs during pipeline operation and reaches piping plover critical habitat, the species could be affected by shoreline and surface water oil, which could cause oiling of the birds, a reduction in the amount of suitable habitat, contaminated drinking water, and contaminated food sources. Food sources consist largely of BMIs in intertidal sand and mud flats (see Section 3.5.2.3, [Aquatic Resources] Alternative 3, for a discussion of impacts on BMIs). However, if a crude oil release should occur during the nesting season, eggs or young could be abandoned, have reduced health, or experience mortality if food or water became contaminated and unavailable. Because piping plover critical habitat occurs within and adjacent to a flowing river rather than in slow-moving streams or wetlands, impacts would likely be short-term as crude oil moves downstream and evaporates or degrades. Therefore, contamination to critical habitat would have moderate to major short-term impacts regardless of mitigation.

To minimize the impacts of a crude oil release, Dakota Access would act quickly to isolate the source of the release using remote-controlled shut-off valves and initiate cleanup activities according to its FRP (Appendix F), in strict adherence to PHMSA regulations, and in consultation with the FWS. Furthermore, Dakota Access has plans in place to rescue and rehabilitate fish and wildlife in the Project Contingency Plan for Oiled Wildlife, and has contracted with multiple wildlife rehabilitation services to assist in the event of an incident, as described in its FRP and GRP (Appendix F). Dakota Access also has in place personnel trained and approved by the USFWS to treat oiled wildlife in the event of an accidental release. The increase in vessel traffic and human disturbance during this remediation and rehabilitation process would likely cause indirect, temporary, and minor behavioral disturbances to piping plover in the area.

As noted previously, Dakota Access constructed, maintains, and inspects the pipeline to meet or exceed industry and governmental requirements and standards. Given these safety measures and the remote to very unlikely likelihood of an occurrence (see Section 3.1, Reliability and Safety), impacts from a WCD crude oil release are considered discountable under the ESA. Therefore, Alternative 3 *may affect, but is not likely to adversely affect* the piping plover and piping plover critical habitat.

Rufa Red Knot and Whooping Crane

In the event that a release occurs during pipeline operation and reaches rufa red knot and whooping crane habitat in the migratory season, the species would be affected by shoreline and surface water oil through oiling of the birds, a reduction in the amount of suitable habitat, contaminated drinking water, and/or contaminated food sources. Remediation activities could also cause noise and habitat disturbance. Impacts would likely be short-term as crude oil moves downstream and evaporates or degrades. In addition, the mitigation and safety measures would help minimize the risk and impacts of a crude oil release, as described above for piping plover.

Given the safety measures discussed above and the remote to very unlikely likelihood of an occurrence (see Section 3.1, Reliability and Safety), impacts from a WCD crude oil release are considered discountable under the ESA. Therefore, Alternative 3 *may affect, but is not likely to adversely affect* the rufa red knot and whooping crane.

Pallid Sturgeon

Pallid sturgeon are not known to be present within the Lake Oahe Crossing area; therefore, no impacts on pallid sturgeon would occur during abandonment. However, in the event a release of crude oil was to occur and reach downstream of Lake Oahe, pallid sturgeon could be affected through acute or chronic toxicity from various oil constituents entrained in the water or in bottom sediments (see Section 3.5.2.3, [Aquatic Resources] Impacts and Mitigation). If adult pallid sturgeon were present in the area where the release occurred, they would likely relocate outside of the contaminated area. Further, most of the oil is anticipated to evaporate, degrade, drift to the shoreline, or remain in the top several meters of the water column; since pallid sturgeon are demersal (USFWS, 2014c), toxicity effects on adult pallid sturgeon resulting from exposure of oil would likely be minimal. However, eggs, larvae, and juvenile fish would be less mobile, and could experience acute or chronic toxicity.

Because pallid sturgeon are benthic feeders, impacts would be short- to long-term if oil becomes entrained in the water column and trapped in sediments, although this portion of oil is expected to be relatively minor (see Section 3.5.2.3, [Aquatic Resources, Impacts and Mitigation] Alternative 3). The mitigation and safety measures described would help minimize the risk and impacts of a crude oil release, as described above for piping plover. Remediation activities could also have effects on pallid sturgeon by creating turbulence and boat noise, bottom disturbance, and temporarily resuspending oil in the water column. Effects would primarily be due to injury or mortality of the younger life stages of the species that are not mobile or have reduced mobility.

Given the safety measures discussed above and the remote to very unlikely likelihood of an occurrence (see Section 3.1, Reliability and Safety), impacts from a WCD crude oil release are considered discountable under the ESA. Therefore, Alternative 3 *may affect, but is not likely to adversely affect* the pallid sturgeon.

Northern Long-Eared Bat

As noted for Alternative 1, recent surveys indicate that roosting, foraging, and/or migrating northern long-eared bats could occur in wooded riparian corridors adjacent to the Cannonball River and Lake Oahe. In the event of a release, these bats could be affected from contaminated drinking water and food sources. The loss and contamination of BMI that are bat's insect prey as adults would result in a decrease in foraging success and potential acute health complications in bats that eat contaminated prey.

Remediation activities could also cause noise and habitat disturbance, which could affect the species daily torpor, resulting in decreased overall fitness as described in Alternative 1. Impacts would likely be temporary and minor to moderate because habitat in this area is limited, which could limit the ability of northern long-eared bats to disperse and move away from the disturbance.

Given the safety measures discussed above for piping plover and the remote to very unlikely likelihood of an occurrence (see Section 3.1, Reliability and Safety), impacts from a WCD crude oil release are considered discountable under the ESA. Therefore, Alternative 3 *may affect, but is not likely to adversely affect* the northern long-eared bat.

Monarch Butterfly

As noted for Alternative 1, recent surveys identified milkweed species that are commonly used by the monarch butterfly for breeding, egg laying, and where its caterpillars begin their instars. While the effects of crude oil release on the monarch butterfly are not fully understood, in the event of a release, the grassland habitat that monarch butterflies use for breeding and laying eggs could be oiled. Oiling of insect habitat commonly results in acute health complications from oiling and consuming oil for other terrestrial arthropods. These health complications include decreased reproductive success and drastic loss of population densities. Other studies have shown that some terrestrial arthropods are resilient to oil exposure, finding that local densities of these insects completely recover after 1 year (Pennings et al., 2014).

Additionally, remediation activities could result in disruption or harm of breeding monarch butterflies along with their eggs, caterpillars, and habitat, which could lead to decreases in the monarch butterfly population. Given the safety measures discussed above for piping plover and the remote to very unlikely likelihood of an occurrence (see Section 3.1, Reliability and Safety), impacts from a WCD crude oil release are considered discountable under the ESA. Therefore, Alternative 3 *may affect, but is not likely to adversely affect* the monarch butterfly.

Conclusion

In conclusion, operation impacts on federally listed species or designated critical habitat associated with Alternative 3 would not be significant given the *no effect* and/or *may affect, but is not likely to adversely affect* determinations for each species.

Alternative 4

Impacts under Alternative 4 would be the same as those described under Alternative 3, although increased mitigation measures, more advanced leak detection and protection, and more stringent conditions would further decrease the risk and impact of a crude oil release (see Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions; and Section 3.5.2.3, [Aquatic Resources, Impacts and Mitigation] Alternative 4). Consequently, the impact and significance determinations for the species would be the same as for Alternative 3.

Alternative 5

Construction and operation of the North Bismarck Reroute could impact federally listed species. This pipeline would be approximately 111 miles long and pass mostly through agriculture fields and areas that are currently undisturbed by pipelines. Impacts from construction of this pipeline would include lighting, noise, habitat disturbance, and the potential for small inadvertent releases of hazardous materials. According to the USFWS's IPaC system, the following species occur within the North Bismarck Reroute are the northern long-eared bat, piping plover, red knot, whooping crane, the northern long-eared bat, monarch butterfly, and the Dakota skipper (USFWS, 2023a).

The North Bismarck Reroute would be collocated 3 percent with other utilities compared to 41 percent collocated with the constructed route, potentially resulting in more disturbance to federally listed species within undisturbed greenfield habitats, should they occur in the affected area, compared to the original route. Operationally, impacts would be similar to the impacts discussed in Alternative 3.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of about 100 miles of pipeline would impact federally listed species through temporary lighting and noise in the areas where ground disturbance for digging, cutting, purging, capping, and backfilling line segments would occur. Disturbance would result in similar impacts on what is described in Alternative 2. This would result in indirect, short-term, and minor impacts on federally listed species.

Oil transport via trucking and/or railway could result in collisions with threatened and endangered species, lighting, noise, and inadvertent releases. Collisions with terrestrial threatened and endangered species would cause injury or mortality of terrestrial species. Lighting and noise associated with truck and rail can increase stress and change behaviors in wildlife. However, trucking and/or rail would use existing highways and/or railroads, where species are likely acclimated to the occasional lighting and noise caused by the transportation routes.

Inadvertent releases of hydrocarbons from a truck and/or railcar could result in oiling, loss of habitat, and chronic health impacts in threatened and endangered species. As noted in Section 3.1, Reliability and Safety, and Section 3.9, Transportation and Traffic, the number of hazardous liquids transportation incidents resulting in serious injuries or fatalities is greater for truck or rail than pipeline (per volume transported) (Furchtgott-Roth and Green, 2013; PHMSA, 2018). The rate of all incidents resulting in a release of crude oil is also greater for truck and rail transportation; for pipelines, an incident occurred approximately once every 720 million gallons of crude oil shipped, as compared to once every 50 million gallons shipped by rail and once every 55 million gallons shipped by truck (PHMSA, 2018). The result would be minor to moderate impacts due to inadvertent releases from trucks and/or railcars.

Piping Plover

The North Bismarck Reroute passes through piping plover critical habitat along the shoreline of the Missouri River. Impacts from this crossing on the piping plover would be similar to what is described in Section 3.5.3.1, [Federally Protected Species] Project Background: Affected Environment and Impacts, for the previous construction of the Project. Assuming the pipeline would be installed under the Missouri River using the HDD method, adverse effects would likely be avoided. Any noise and light disturbance would be temporary and minor and not expected to affect bird behavior. Therefore, construction *may affect, but is not likely to adversely affect* piping plover and piping plover critical habitat.

The short-term use of truck and/or rail to transport oil could result in lighting and noise impacts adjacent to occupied habitat. However, piping plover that inhabit areas near roads or train tracks are likely acclimated to the regular lighting and noise along the routes. Impacts would be minor and temporary to short-term and would not be considered significant as defined under the ESA; therefore, the short-term use of truck and/or rail transport of oil *may affect, but is not likely to adversely affect* the piping plover.

Under Alternative 1 combined with Alternative 5, piping plover would be temporarily displaced from the work area from dredging in Lake Oahe and increased lighting and noise for the duration of the pipe removal process during abandonment. Dredging would occur within piping plover critical habitat, resulting in a temporary loss of critical habitat until dredging is complete and the area is returned to baseline conditions. Thus, Alternatives 1 and 5 combined would result in major, short-term impacts and therefore *are likely to adversely affect* the piping plover and piping plover critical habitat.

Under Alternative 2 combined with Alternative 5, piping plover would be temporarily disturbed by lighting and noise at the HDD sites where Dakota Access would purge, cut, and cap the pipeline. HDD purging, and capping would occur outside but adjacent to piping plover critical habitat, and would impact piping plover inhabiting the banks of the Missouri River. Thus, Alternative 2 and 5 combined would result in minor, short-term impacts and therefore *may affect, but are not likely to adversely affect* the piping plover and piping plover critical habitat.

Rufa Red Knot, and Whooping Crane

Construction of the North Bismarck Reroute could impact the rufa red knot and whooping crane. Impacts from this alternative on the rufa red knot and whooping crane would be similar to what is described in Section 3.5.3.1, [Federally Protected Species] Project Background: Affected Environment and Impacts, for the previous construction of the Project.

Impacts on the rufa red knot and whooping crane from Alternative 1 or 2 combined with Alternative 5 would be similar to what is described above for piping plover. In summary, dredging, lighting, and noise from the pipeline abandonment activities, including removal, purging, and capping, would result in temporary disturbance of both the habitat and species. Because these species would likely fly to uncontaminated habitat farther up-river or down-river as part of their migration, both Alternatives 5 and 1 as well as Alternatives 5 and 2 would result in minor and short-term impacts; therefore, they *may affect, and are not likely to adversely affect* the rufa red knot and whooping crane.

Northern Long-Eared Bat

A statewide survey of bat species identified suitable habitat for northern long-eared bat in large riparian woodland complexes, none of which occur along the North Bismarck Reroute (Nelson et al., 2015). However, smaller riparian woodland complexes may be able to support the species, as indicated by the results of the SRST 2021 acoustic bat surveys (SRST, 2021) and supported by other research (Barnhart and Gillam, 2016). These types of habitat are not known to have been widely surveyed for northern long-eared bats in North Dakota. If northern long-eared bats are present in smaller riparian woodland complexes likely to occur along the North Bismarck Reroute, they would be affected by noise, lighting, and tree clearing.

Noise and light disturbance associated with construction and pipeline abandonment could affect the species daily torpor, resulting in decreased overall fitness as described in Alternative 1. Impacts would be temporary and minor to moderate because habitat in the area is limited, which could limit the ability of northern long-eared bats to disperse and move away from the disturbance. Tree clearing could result in a loss of suitable roosting habitat, causing bats to be dispersed to nearby suitable habitat where they would likely face increased competition for mates and foraging.

The short-term use of truck and/or rail to transport oil could result in lighting and noise impacts adjacent to northern long-eared bat habitat. However, it is unlikely that northern long-eared bats inhabit areas near roads or train tracks due to the regular lighting and noise along the routes, which would interrupt their natural environmental cues for foraging. If the bats are present, then it is likely that they are acclimated to the occasional noise and light disturbances along these routes. Impacts if the bats were present would be negligible and would not be considered significant as defined under the ESA.

Alternatives 1 and 5 combined would result in minor to moderate, short- to long-term impacts that would result in a *may affect and is likely to adversely affect* determination. Based on these findings, impacts on northern long-eared bats would not be significant.

Alternative 2 and 5 combined would result in minor to moderate, short-term impacts of the northern long-eared bat from incidental take that would result in a *may affect but not likely to adversely affect* determination. Based on these findings, impacts on northern long-eared bat would not be significant.

Dakota Skipper

Pipeline construction and abandonment could result in injury or mortality of Dakota skippers from trenching and soil compaction in the winter when they burrow into the soil of mixed grass and tall grass prairies, as noted in the USFWS 2016 BO for the DAPL Project (USFWS, 2016b). The incidental release of hazardous substances such as fuel or crude oil during construction and operation in occupied habitat would result in a loss of suitable habitat from contamination of plants and soil, creating toxic conditions that could lead to Dakota skipper mortality. Impacts would likely be temporary with remediation of contaminated habitat in this terrestrial environment. In addition, the 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of permanent impacts totaling approximately 1.1 acres of habitat loss. Impacts would be minor given the small areas affected.

Because the Dakota skipper is not known to occur in the townships crossed by the North Bismarck Reroute based on current available data from the USFWS (USFWS, 2018a), construction and operation are expected to result in *no effect* on the Dakota skipper. However, there could be adverse effects from abandonment along about 100 miles of pipeline; therefore, Alternative 5 *is likely to adversely affect* the Dakota skipper. In addition, given the potential for adverse effects on the species from ground disturbance, further review should be conducted prior to construction of the North Bismarck Reroute to determine if new information indicates that Dakota skipper could be present.

The abandonment of the constructed pipeline as described under Alternative 1 or 2 would result in *no effect* on the Dakota skipper as it does not inhabit the area that would be impacted based on the USFWS 2016 BO. Therefore, combining the effects of Alternatives 1 or 2 would not alter the impact level for Alternative 5.

Monarch Butterfly

Pipeline construction and abandonment could result in injury or mortality of monarch butterflies from trenching, vegetation clearing, and other forms of habitat disturbance that would remove vital milkweed species from the grassland areas that they inhabit and use for reproduction. The incidental release of hazardous substances such as fuel or crude oil during construction and operation in occupied habitat would result in a loss of suitable habitat from contamination of plants and soil, creating toxic conditions that could lead to acute health effects on the butterfly. Impacts would likely be temporary with remediation of contaminated habitat in this terrestrial environment. In addition, the 11 mainline valves constructed for the North Bismarck Reroute would result in small, dispersed areas of permanent impacts totaling approximately 1.1 acres of permanent habitat loss. Impacts would be minor given the small areas affected.

Alternatives 1 and 5 combined would result in short-term to permanent, minor to moderate impacts that would result in a *may affect and is likely to adversely affect* determination. Based on these findings, impacts on northern long-eared bats would not be significant.

Alternatives 2 and 5 combined would result in short-term, minor to moderate impacts of the northern long-eared bat from incidental take that would result in a *may affect and is likely to adversely affect* determination. Based on these findings, impacts on northern long-eared bat would not be significant.

Conclusion

In conclusion, based on current information, construction and operation of the North Bismarck Reroute would likely have a significant impact on three federally listed species (the piping plover, northern long-eared bat, and Dakota skipper), one candidate species (the monarch butterfly) and one federally designated critical habitat (piping plover critical habitat) given the *likely to adversely affect* determination for these species.

Alternative 5 would include abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline.

Since there would be no impacts on Dakota skipper from Alternatives 1 and 2, the combined construction operation impacts with Alternative 5 would be unchanged and would still be significant. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operational impacts on piping plover, piping plover critical habitat, northern long-eared bat, and monarch butterfly for Alternatives 5 and 1 would be significant. Because of the limited construction activities associated with Alternative 5 and 2, the impacts on piping plover and northern long-eared bat would not be significant. The combined impacts from Alternatives 2 and 5 could also result in significant impacts on the monarch butterfly.

Bald and Golden Eagles

The following discussion provides an assessment of impacts on bald and golden eagles that could occur due to future Project activities under each of the five proposed alternatives.

Alternative 1

Abandonment by removal of the pipe could have indirect impacts on the bald and golden eagles nesting or foraging around the Cannonball River confluence due to temporary noise impacts and the disturbance of aquatic and terrestrial prey species. If bald eagles are observed within the Project Area of Alternative 1, USACE recommends that Dakota Access conform to the following bald eagle guidelines.

- To conform to the *National Bald Eagle Management Guidelines* (USFWS, 2007), conduct pre-construction eagle specific surveys to determine active or alternate bald eagle nest presence within 660 feet of clearing and construction activities.
- In the event that a bald or golden eagle nest is located within 660 feet of the construction corridor, implement the guidelines set forth in the USFWS *National Bald Eagle Management Guidelines* (USFWS, 2007) to mitigate any impacts on active bald and golden eagle nesting sites. These guidelines would include timing construction within the 660-foot buffer to outside of the eagle nesting and breeding seasons, which take place between December and August in North Dakota, or providing sufficient documentation that an alternate nest has not been active in five breeding seasons or more, and thus avoiding disturbance is not warranted.
- When motorized watercraft use is required during the breeding season in areas within the 660-foot buffer, avoid concentrations of vessels, minimize trips through the area, and avoid stopping within the buffer area.
- Off-road vehicle use is prohibited during the breeding season within 660 feet of the nest.

Pipeline abandonment under Alternative 1 requires removal by excavation in Lake Oahe, fish and other aquatic organisms could experience mortality due to increased turbidity or physical injury from equipment, decreasing the prey available to eagles. However, with additional monitoring and mitigation measures and given the abundant prey habitat upstream and downstream from the Lake Oahe crossing, indirect impacts on bald and golden eagles would be negligible and long-term.

There would be no operation associated with Alternative 1, and so there would be no operational impacts, including no risk of a crude oil release associated with the Project.

In conclusion, abandonment by removal of the pipeline under Alternative 1 would not have significant impacts on bald and golden eagles.

If Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on bald and golden eagles. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Given the distance from potential eagle nesting and foraging areas at the Cannonball River confluence, the onshore work involved in pipeline abandonment, including purging, cutting, and capping the pipe at the former HDD sites, Alternative 2 would have *no effect* on bald and golden eagles as the work would occur well outside the 660-foot buffer recommended by the USFWS (USFWS, 2007).

The abandoned pipe would result in *no effect* on bald and golden eagles. The pipe would be flushed of all contaminants and be observed, evaluated, and remediated if any problem conditions occur from leaving the pipe in place.

Similar to Alternative 1, Alternative 2 would likely result in the construction and operation of a pipeline reroute, which may result in indirect effects on bald and golden eagles. Direct and indirect impacts associated with the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5, are described under Alternative 5 below.

Alternative 3

No additional construction impacts would occur under Alternative 3 beyond those discussed in Section 3.5.3.1, [Federally Protected Species] Project Background: Affected Environment and Impacts.

Any inadvertent release of hydrocarbons from an inadvertent crude oil release during Project operation could indirectly affect bald eagles since fish make up an important component of their diet. Golden eagles would not likely be affected because they primarily hunt in upland areas (USFWS, n.d.). It is expected that a release from beneath Lake Oahe would travel along the path of least resistance, which would be along the bore hole 4 to 126 feet underground. However, indirect impacts would occur if the release reached the surface and covered or contaminated prey species. Additionally, bald eagles are scavengers, and it is possible that a bald eagle could be oiled when scavenging contaminated prey. Consumption of contaminated prey species within the release response area could result in both acute and chronic health impacts on bald eagles hunting in the release area.

The relevant effect metric for analyzing impacts of an oil release on bald eagles is the farthest distance where oil thickness occurs greater than 10 µm. Bald eagles would not likely be present along the shoreline or in Lake Oahe except when foraging for prey in shoreline areas. Bald eagles could consume oiled prey species affected when oil thickness is greater than 10 µm. In an unmitigated WCD scenario, modeling predicted the shoreline would be oiled intermittently between 0.8 and 46.3 miles downstream at a thickness of greater than 10 µm in ice-free conditions and within 2 miles in ice-covered conditions in the form of subsurface whole oil under ice. The modeled impacts are highly variable across these distances and over different timeframes. Dakota Access would be required to implement mitigation measures that would restrict the downstream dispersal of crude oil. Mitigation efforts are likely to reduce the impact intensity compared to the unmitigated scenarios.

Depending on the extent of the release from an inadvertent WCD crude oil release, Alternative 3 would have temporary to long-term, and minor to major indirect impacts on bald eagles. These impacts combined with the remote to very unlikely likelihood of occurring represent a negligible to moderate risk. In conclusion, impacts on bald and golden eagles from operation under Alternative 3 would not be significant.

Alternative 4

Impacts under Alternative 4 would be the same as those described under Alternative 3, although increased mitigation measures, more advanced leak detection and protection, and more stringent conditions would further decrease the risk and impact of a crude oil release (see Section 2.6.2, Alternative 4: Grant

Requested Easement with Additional Conditions; and Section 3.5.2.3, [Aquatic Resources, Impacts and Mitigation] Alternative 4). To comply with federal and tribal protection requirements, Alternative 4 includes the following additional easement condition:

- In the event of any required remediation activities, Dakota Access shall conform to the *National Bald Eagle Management Guidelines* (USFWS, 2007) to and minimize off-road vehicle traffic within 660 feet of bald eagle observations where feasible.

Consequently, the impacts for bald and golden eagles would be the same or less than for Alternative 3, and impacts would not be significant.

Alternative 5

Construction and operation of the North Bismarck Reroute could involve impacts on bald and golden eagles. This pipeline would be approximately 111 miles long and passes mostly through agriculture fields and areas that are previously undisturbed by pipelines. Impacts from construction of this pipeline would include lighting, noise, habitat disturbance, and risk of inadvertent releases of hazardous materials.

The North Bismarck Reroute passes through small areas with potential nesting and foraging habitat for bald and golden eagles, particularly at the Missouri River crossing and other waterbody crossings. Impacts from lighting, noise, and habitat disturbance would likely result in eagles leaving the nest until construction activity ceased. Dakota Access would likely be required to implement the guidelines set forth in the USFWS *National Bald Eagle Management Guidelines* (USFWS, 2007) to mitigate any impacts on active or alternate bald nesting sites within 660 feet of construction activities. Any mitigation requirements, including for bald and golden eagles, would be determined by the applicable permitting agencies. Potential recommendations would include pre-construction surveys, timing construction outside of the breeding season where nests are discovered, minimizing motorized vessel traffic, stops, concentrations, and avoiding vehicle use within the 660-foot buffer.

With additional monitoring and mitigation measures, impacts from lighting, noise, and habitat disturbance from the construction of the North Bismarck Reroute would be indirect, short-term, and minor.

Inadvertent releases of hydrocarbons could occur both during construction and operation of the North Bismarck Reroute. Impacts from inadvertent releases of hydrocarbons on bald and golden eagles would be similar to what is described for Alternative 3. The North Bismarck Reroute would impact more undisturbed greenfield areas than the original constructed route, resulting in potential disturbances on bald and golden eagle in more remote areas.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of about 100 miles of pipeline would impact bald and golden eagles through temporary light and noise in areas where ground disturbance for capping line segments would occur. This would result in indirect, short-term, and minor impacts throughout the pipeline right-of-way.

Trucking and/or railway transport of the oil would result in lighting and noise impacts and could result in inadvertent releases of hazardous materials. Lighting and noise impacts from trucking and/or rail would likely use existing highways and railroads, where bald and golden eagles have likely avoided or are acclimated to the occasional lighting and noise caused by the transportation routes. Thus, any short-term increase in lighting and noise from the use of trucks and/or railroads to transport oil during construction of the North Bismarck Reroute on bald and golden eagles would be minor.

Inadvertent releases of hydrocarbons from a truck and/or railcar could result in the oiling of eagle prey species and chronic health impacts in bald and golden eagles. Impacts of a crude oil release from a truck and/or railcar would be similar to what is described in Alternative 3, as noted in Section 3.1, Reliability and Safety, and Section 3.9, Transportation and Traffic, road and rail tend to have more frequent releases of hazardous materials than pipelines, resulting in easier cleanup and remediation.

In conclusion, as there is only a small amount of bald and golden eagle habitat within the North Bismarck Reroute right-of-way, construction and operation impacts on bald and golden eagles under Alternative 5 would not be significant.

Because the Project has been constructed, Alternative 5 would only be implemented if Dakota Access is required to abandon a portion of the existing pipeline that was constructed; Alternative 5 results from abandonment of the Lake Oahe crossing (under Alternative 1 or Alternative 2). Therefore, impacts associated with Alternative 5 also include the impacts associated with abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Given the level and duration of impacts discussed above, the combined construction and operation impacts on bald and golden eagles for Alternatives 5 and 1 and Alternatives 5 and 2 would not be significant.

3.6. LAND USE AND RECREATION

This section describes the potential impacts on land use and recreation resources associated with the Project and each of the alternatives described in Chapter 2, Alternatives, of this EIS.

3.6.1. Land Ownership

3.6.1.1. Project Background: Affected Environment and Impacts

The Project Area crosses USACE federal lands on the east and west banks of Lake Oahe, as well as crossing under Lake Oahe. The pipeline crosses beneath the lake for approximately 1,103 feet (0.21 mile). The pipeline crosses private lands for approximately 911 feet east of the lake's east bank and approximately 1,138 feet west of the lake's west bank. The pipeline is routed parallel to existing linear infrastructure (an overhead powerline and a buried gas transmission pipeline) across Lake Oahe in the same area. Both HDD sites, measuring approximately 200 by 250 feet, were located on private lands, as was the stringing corridor that was required to facilitate the installation. The Project Area is located approximately 0.55 mile north of the northern boundary of the SRST reservation.

The Project required a 50-foot-wide permanent easement, generally centered on the pipeline (25 feet on either side of the centerline). The corridor has been returned to a vegetative state and is maintained for pipeline inspection and operational maintenance.

There were no permanent impacts on land ownership as a result of the pipeline construction.

3.6.1.2. Current Affected Environment

There have been no changes to land ownership since the 2016 EA analysis was conducted.

3.6.1.3. Impacts and Mitigation

Alternative 1

Under Alternative 1, Dakota Access would require a temporary construction easement of approximately 1,477 acres on federal and private property to perform the associated construction activities. These easements would limit the activities that landowners could perform during the time of construction. These impacts would only apply to the area within the construction easement (which would be beyond the current easement), and the landowners would still be able to use land outside of the easement as they did prior to the start of construction. The construction under Alternative 1 would last 6 to 20 years or more, and Alternative 1 would have long-term, moderate impacts on land ownership.

Alternative 1 would have no operational impacts on land ownership because the easements would only be for the duration of construction and the easement to operate the pipeline across federal lands would be denied. If Alternative 1 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on land ownership.

In conclusion, as a result of the direct and indirect effects identified above, construction activities associated with Alternative 1 are not expected to result in significant impacts on land ownership.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Under Alternative 2, Dakota Access would access the HDD tie-in points via its existing 50-foot-wide permanent easement on private property and would require a construction easement for two temporary construction work areas (approximately 200 feet by 150 feet each) on either side of the crossing on private land to allow it to perform construction activities to purge, cut, and cap the pipeline to abandon it in place. This easement would be much smaller than the easement needed for Alternative 1. The impacts from this easement would be temporary and minor.

Alternative 2 would have no operational impacts on land ownership because the easements would only be necessary for the duration of construction and the easement to operate the pipeline across federal lands would be denied. If Alternative 2 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on land ownership.

In conclusion, construction impacts on land ownership associated with Alternative 2 are not expected to be significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

Alternatives 3 and 4

Alternatives 3 and 4 would have no construction or operational impacts on land ownership under normal operating conditions because no new land would be bought or sold as a result of these alternatives. In the event of a WCD crude oil release, all the release scenarios described in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, of this EIS could impact land ownership. Temporary property easements for the pipeline would likely be required for cleanup and mitigation in the area of a release, which would limit the activities that landowners could perform during the time of cleanup and mitigation. There is approximately 4 miles of federal land located within 4 miles upstream of the crossing site and 65 miles of federal land located within 65 miles downstream of the crossing site. Due to the temporary nature of these easements, the land ownership for easement areas would remain the same, and no permanent easement would be required. Impacts on the underlying landowner would be minor and temporary in consequence, with effective cleanup and mitigation. In addition, the likelihood of a crude oil release from any of the WCD scenarios (Scenarios 1 through 18) would be remote to very unlikely, resulting in an overall negligible risk to land ownership.

Conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release. Therefore, should a release occur, impacts on land ownership under Alternative 4 would be similar to or less than under Alternative 3, and the additional conditions would aid in minimizing the extent and impacts of a release.

Alternative 5

Construction of the North Bismarck Reroute would result in impacts on land ownership associated with an operational easement for 111 miles of pipeline all located on private property. As shown in the 2016 EA, the North Bismarck Reroute would not cross any USACE reservoirs. It is unknown whether landowners along this route would be willing to negotiate an easement. Unwilling landowners may face eminent domain proceedings or similar legal challenges. In addition, the State of North Dakota previously evaluated the DAPL Project's siting in North Dakota and issued the required permissions for the Lake Oahe route. Therefore, the North Bismarck Reroute presents a conflict with the state's past analysis. Regardless, current landowners along the reroute would become permanently encumbered by an easement for operation of the pipeline, with some restrictions on land use.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below. See Section 3.9, Transportation and Traffic, for a discussion on the impacts on transportation and traffic.

The USACE assumes that the existing about 100 miles of DAPL Project pipeline would be abandoned in place, which may result in minor land disturbance for cutting and capping segments of the pipeline. If cutting and capping were to occur, Dakota Access may need to acquire temporary easement for construction on the land crossed. As a result, there would be temporary and minor impacts on land ownership.

This EIS also assumes that trucking or rail transportation would use existing infrastructure during permitting and construction of the North Bismarck Reroute. Generally, transporting oil via truck and rail would not result in new impacts on land ownership. However, as described in Section 2.4, Alternative Transportation Methods, transportation of oil by truck or rail would likely result in more frequent, lower volume crude oil releases. The extent and impact are dependent on the size and location of the release. Crude oil releases from trucking or rail transportation would result in temporary to short-term impacts on land ownership during cleanup and remediation activities as landowners may be limited in the activities that they can perform on their land. See Section 3.9 for a discussion on the impacts on transportation and traffic.

In conclusion, the full extent of construction and operational impacts on land ownership for Alternative 5 cannot be determined at this time because it is unknown whether landowners would indeed negotiate a pipeline easement. Regardless, new landowners would become permanently encumbered by an easement that would restrict the activities they can perform on their land for the duration of operation of the pipeline. Therefore, impacts on land ownership are considered at least moderate, but not significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Based on the assessments above, the combined impacts on land ownership for Alternatives 5 and 1 would not be significant. The combined impacts on land ownership for Alternatives 5 and 2 would also not be significant.

3.6.2. Land Use

3.6.2.1. Project Background: Affected Environment and Impacts

The Project Area is located at the border of Morton and Emmons counties. As discussed in the 2016 EA, aerial photography, the National Land Cover Database (Multi-Resolution Land Characteristics Consortium, 2011), and the Morton County Zoning Map (Morton County, 2014 as cited in USACE, 2016) were used to identify and classify general land use for the Project Area. The Project crosses through agricultural land and open space.

Agricultural lands are primarily used for ranching and cultivating crops and include rangelands. Agricultural lands allow for land uses such as farming, ranching, animal feeding operations, grain storage, and related functions. Agricultural lands within the Project Area are primarily pivot irrigated cropland and grazing land (i.e., areas used for production of annual crops such as corn and soybeans). There is approximately 0.1 acre of developed land within federal lands that is within the permanent right-of-way.

Open space is the primary land use within the Project Area. Open space includes all land that is not agriculture or developed—namely wetlands, open water, grasslands, and scrub-shrub. Open space is found primarily along the riverbanks and includes Lake Oahe. The majority of USACE federal lands in the Project Area are designated as open space. There were 15.5 acres of open land used for construction of the HDD outside of federal lands. There is approximately 1 acre of open space within federal lands that is within the permanent right-of-way. See Sections 3.3, Water Resources, and 3.4, Vegetation and Noxious Weeds, for a discussion on water resources and vegetation, respectively.

Construction of the HDD crossing required the temporary prohibition of livestock grazing and restrictions on livestock movement across the construction right-of-way and workspace areas, including the HDD pull-back area. Due to the narrow, linear design of the Project and the alignment along property boundaries, livestock grazing reductions and livestock movement restrictions were temporary to short-term, minor, and not significant. After the completion of construction, the work area was restored, and ranching resumed over the HDD pull-back areas, as well as the operational right-of-way. Additionally, grazing activities returned to their previous state after successful revegetation of the disturbed areas.

3.6.2.2. Current Affected Environment

While the construction of the HDD area modified the area as described above, the Project Area has been restored and grazing activities have resumed. Additionally, since construction of the pipeline, two access roads and mainline valves (one on each side of the crossing) have been constructed but are outside of the Project scope. The construction of these roads converted approximately 2 acres of land from agricultural land to developed land.

3.6.2.3. Impacts and Mitigation

Alternative 1

Alternative 1 would require excavation with spoil storage requiring approximately 1,400 acres of land in the Project Area over 6 to 20 plus years. This area includes prime farmland and land used for livestock grazing and ranching. Therefore, Alternative 1 would result in short- to long-term and major impacts on livestock grazing, as there would be an overall change in the value and character of the grazing lands, and it would not be relied upon for its current use until restoration is complete. The new access roads in the area may be temporarily affected or used during construction under Alternative 1, but the roads would be restored to their existing state following construction.

Alternative 1 would have no operational impacts because the pipeline would be removed and would no longer be operational. If Alternative 1 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on land use.

In conclusion, the construction impacts associated with Alternative 1 on land use are expected to be significant.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 would result in temporary and minor impacts on land use because the pipe would need to be purged, cut, and capped, which would disrupt grazing in the area, but grazing would return to current conditions once the abandonment in place is complete. These impacts would be similar in intensity although of shorter duration than the original construction impacts from the HDD.

Alternative 2 would have no operational impacts because the pipeline would be abandoned in place and would no longer be operational. If Alternative 2 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on land use.

In conclusion, the impacts on land use discussed above are not likely to be significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternatives 3 and 4

Alternatives 3 and 4 would have no new construction impacts because they would not require any new construction in the Project Area.

Under normal operating conditions, Alternatives 3 and 4 would not result in operational impacts on land use because operation of the pipeline would not disturb the land, limit agriculture or ranching, or change the existing land use classifications. However, in the event of a WCD crude oil release, all the release scenarios described in Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, would impact land use because the existing ranching activities would be stopped until the oil is cleaned up and the land returns to pre-release conditions. Livestock and ranching activities may require relocation to other agricultural land if available until the release is cleaned up. Further, as is discussed in Section 3.3.1, [Water Resources] Surface Waters, there are several agricultural intakes within the area that would be impacted by a WCD crude oil release under any of the scenarios. Additionally, if contaminated water is withdrawn, there could be harm to livestock. Therefore, any irrigation supplied from the Missouri River would need to be paused until the release is cleaned up with no current plan for alternate sources of agricultural water during this time period. These impacts would be short- to long-term and moderate to major for mitigated and unmitigated scenarios, determined by the extent of the release, how quickly mitigation measures are implemented, and the area restored. However, the likelihood of a WCD crude oil release occurring ranges from remote to very unlikely, resulting in an overall risk of negligible to moderate. In conclusion, impacts on land use from Alternatives 3 or 4 are not likely to be significant.

In addition, conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release. Therefore, should a release occur, impacts on land use would be similar to or less than those under Alternative 3, and the additional conditions would aid in minimizing the extent and impacts of a release.

Alternative 5

Construction of the North Bismarck Reroute would cross primarily agricultural land and open space. Agricultural land makes up approximately 38.9 percent and open space makes up approximately 58.1 percent of the workspace for Alternative 5. The construction of the new pipeline would disrupt grazing activities in the Project Area for the duration of construction. Construction in agricultural areas disrupts agricultural production. Landowners are typically reimbursed for damages/lost production during construction and/or restoration. With proper topsoil segregation measures, these impacts would be minor and short-term given they would only occur during active pipeline construction, and grazing/agricultural activities would return to current conditions once construction was complete. In addition, the 11 mainline valves constructed for the North Bismarck Reroute would result in the conversion of approximately 1.1 acres of land to developed land. Impacts as a result would be minor given the small areas affected.

Under normal operating conditions, Alternative 5 would not result in operational impacts because operation of the pipeline would not disturb the land, limit agriculture or ranching, or change the existing land use classifications. However, if a release were to occur and impact agricultural or ranching lands, these activities would be affected while the areas are unusable. Agricultural irrigation supply from affected surface waterbodies or groundwater sources would be paused until the release is cleaned up, which would also affect agriculture or ranching practices.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Abandonment of the existing pipeline may result in minor land disturbance for cutting and capping segments of the pipeline. If cutting and capping were to occur, existing grazing activities would be disturbed. These impacts would be minor and temporary. Grazing activities would return to current conditions once abandonment activities were complete. There would be no operational impacts on land use associated with abandoning the pipeline as it would no longer be operational.

This EIS assumes that trucking or rail transportation would use existing infrastructure resulting in no impacts on land use.

In conclusion, construction and operational impacts on land use for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operational impacts on land use for Alternatives 5 and 1 would be significant. The combined construction and operational impacts on land use for Alternatives 5 and 2 would not be significant.

3.6.3. Recreation and Special Interest Areas

3.6.3.1. Project Background: Affected Environment and Impacts

Generally, recreation and special interest areas include federal, state, or county parks and forests; conservation lands; Wildlife Management Areas (WMA); hunter management areas; natural landmarks; scenic byways; designated trails; recreational rivers; and campgrounds.

As discussed in the 2016 EA, Lake Oahe contains 2,250 miles of shoreline that is open to the public and provides many recreation opportunities including fishing, swimming, sightseeing and bird watching, camping, and picnicking. Approximately 2 million people visit Lake Oahe annually for its many recreational opportunities (USACE, 2021a). Fishing is the major recreational activity of visitors to Lake Oahe, with 44 percent of visitors engaging in this activity (USACE, 2021b). Nearby recreational opportunities in the vicinity of the Project Area include Lake Oahe and the Missouri River. The HDD crossed under Lake Oahe; there were minor impacts on recreation from the construction of the HDD because the area is used for recreational opportunities, as discussed above. However, the area that was affected by construction is a small portion of the overall lake, and recreation was not impeded throughout the entire lake; therefore, the impacts were temporary, minor, and not significant.

As discussed in the 2016 EA, there are no public boat access sites, marinas, or public swimming beaches within 1 mile of the Project Area. Additionally, there are no designated state parks or recreation areas, historic trails, scenic by-ways, designated wilderness, or natural areas or other sensitive land uses in the area (North Dakota Parks and Recreation Department, 2021). Additionally, no Private Land Open to Sportsmen is located within the Project Area (NDGF, 2019).

The Oahe WMA is located along the Missouri River and Oahe Reservoir, approximately 17 miles south of Bismarck, North Dakota (NDGF, 2021). The Project Area is about 14.5 miles south of the Oahe WMA; therefore, no impacts occurred in the area during construction of the HDD crossing.

As discussed in the 2016 EA, Lake Oahe is not listed as needing a TMDL and fully supports recreational use (NDDOH, 2019). Because Lake Oahe already meets the state water quality standards, construction of the HDD crossing did not cause an impairment of water quality or the designated use of Lake Oahe. For further analysis, see Section 3.3.1.

The Wilderness Act of 1964 defines wilderness as lands that have opportunities for solitude or primitive recreation, have at least 5,000 acres of land or are sufficient size, and may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. There are three designated wilderness areas within North Dakota: Chase Lake, Lostwood, and Theodore Roosevelt. There are no designated wilderness areas and no designated Nature Preserves or Natural Areas within 1 mile of either crossing (Wilderness Institute, 2021); therefore, no impacts occurred in wilderness areas as a result of the construction of the HDD crossing.

As discussed in the 2016 EA, the SRST reservation is located at the border of South Dakota and North Dakota, approximately 0.55 mile south of the Project Area. The Cannon Ball River is aligned with the northern border of the SRST reservation in Sioux County, North Dakota. The total land area of the SRST reservation is 2.3 million acres; of that, over 1.4 million acres is tribally owned. The SRST tribal members are descendants of the Teton and Yankton Bands of the Lakota/Dakota Nations (SRST, 2016 as cited in USACE, 2016). Tourism attractions within the reservation include Sitting Bull Grave Site, Standing Rock Monument, the Lewis and Clark National Historic Trail, and the Prairie Knight Casino and Resort (North Dakota Tourism, 2021). The terrain of the reservation consists of river valleys, lakes, woodlands, prairies, and rolling hills (SRST, 2016 as cited in USACE, 2016). Hunting and fishing opportunities on the reservation are available and include big game (white tail deer, mule deer, and antelope) and small game (jackrabbit, cottontail, and squirrel) (SRST Game and Fish Department, 2021). The recreation areas managed by the SRST, including the Fort Yates and Walker Bottom Recreation Areas, are located south of the HDD crossing and Project Area. The Cannonball South Area lies within the external boundary of the SRST reservation. The Cannonball South Area is used for shoreline fishing and hunting (USACE, 2010). There were impacts on recreation from the construction of the HDD because the area is used for recreational opportunities. However, these impacts were limited to the time of construction, and construction occurred over 1 mile away from the area; therefore, the impacts were temporary, minor, and not significant. A discussion of subsistence use can be found in Section 3.8, Socioeconomics, Environmental Justice, and Health.

3.6.3.2. Current Affected Environment

There have been no changes to recreational opportunities within the area since the 2016 EA analysis. The tribal members of the SRST reservation have access to the same recreational opportunities within the Project Area.

3.6.3.3. Impacts and Mitigation

Alternative 1

Alternative 1 would require excavation in the Project Area over 6 to 20 plus years and would result in long-term and moderate impacts on recreation because construction would disrupt hunting and wildlife viewing for an extended period of time. Alternative 1 would also result in short-term and moderate impacts on boating and recreational activities on Lake Oahe as activities would be restricted in the area where construction equipment works to remove the pipeline. Lake Oahe is approximately 231 miles long, and the Project is located at the end of the lake; therefore, the restriction to boating and recreational use would not be disruptive to the overall boating and recreational use for the lake. There could also be additional impacts on existing boat ramps and lake access points from the construction resulting from Alternative 1.

Alternative 1 would have no operational impacts from the pipeline across Lake Oahe because the pipeline would be removed and would no longer be operational. If Alternative 1 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on recreation and special interest areas.

In conclusion, as a result of the effects identified above, construction activities associated with Alternative 1 would not result in significant impacts on recreation.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are likely to also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 would result in minor and temporary impacts on recreation, in particular hunting or bird watching. Minor construction activity would be required to purge, cut, and cap the pipeline, which would disrupt recreational activity in the immediate vicinity of the construction work area during construction. These impacts would be similar in intensity although of shorter duration than the original construction impacts from the HDD.

Alternative 2 would have no operational impacts because the pipeline would be purged and capped and would no longer be operational. If Alternative 2 is selected, it would result in at least a temporary shutdown of the pipeline. This temporary shutdown would have no impact on recreation and special interest areas.

In conclusion, the recreation impacts associated with Alternative 2 are not likely to be significant.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternative 3

Alternative 3 would have no new construction impacts because it would not require any new construction in the Project Area.

Alternative 3 would result in impacts on recreation in the event of a crude oil release. In the event of a WCD crude oil release, surface effects, in-water effects, and shoreline effects would present impacts on recreation and special interest areas.

Surface thicknesses greater than 0.01 μm would create a sheen that would impact recreational boating. Impacts on recreational boating in an unmitigated scenario would occur between 30 and 50 miles in an ice-free time or within 2 miles in ice-covered conditions. While a sheen may be present intermittently at locations up to 50 miles downstream, sheening may not be present for all 10 days and would change as time progresses.

In-water effects would impact recreational boating where DHC in-water concentration are greater than 1 μg/L. In an unmitigated scenario, this concentration would occur intermittently between 38 and 60 miles in an ice-free time and between 15 and 25 miles in ice-covered conditions. While DHC at this threshold would occur at locations up to 60 miles downstream, the DHC would not be present for all 10 days and would change as time progresses.

Shoreline effects would impact recreation and special interest areas where oil mass exceeds 0.09 g/ft^2 on the shoreline if cleanup is triggered on the shore, affecting use of the shoreline area for recreation. In an unmitigated scenario shoreline, impacts would meet this threshold between 23 and 50 miles in an ice-free time. In an ice-covered scenario, shoreline impacts are not anticipated, as the ice edge would extend over the shoreline. While a cleanup may be needed at locations up to 50 miles downstream, the overall need for cleanup would change as time progresses.

A WCD release could take several years to clean up to standards that would be safe for recreational activity in both unmitigated and mitigated scenarios, determined by the extent of the release and how quickly mitigation measures are implemented. Dakota Access has stated it would respond rapidly, including through detecting the release, shutting down the pipeline pumps, and closing the valves on either side of the crossing within 12.9 minutes and deploying personnel to begin immediate mitigation efforts. Impacts would be short-term and moderate to major because they would impede recreational activity in the area of the release and downstream until cleanup is complete. The likelihood of a WCD crude oil release occurring is remote to very unlikely. The combined short-term but moderate to major impact with the identified likelihood results in an overall risk to recreation and special interest areas of negligible to moderate. In conclusion, construction and operational impacts (including the risk of a crude oil release) on recreation and special interest areas associated with Alternative 3 would not be significant.

Alternative 4

Alternative 4 would have no new construction impacts because it would not require any new construction in the Project Area.

Alternative 4 would result in similar impacts as Alternative 3, but additional mitigation measures would be implemented that would reduce the likelihood, response time, and impacts in the event of a release. Additional conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release. Therefore, should a release occur, impacts on recreation and special interest areas would be similar to or less than those described under Alternative 3, and the additional conditions would aid in minimizing the extent and impacts of a release. For a discussion on the impacts on water resources, see Section 3.3, Water Resources.

Therefore, construction and operational impacts (including the risk of a crude oil release) on recreation and special interest areas associated with Alternative 4 are likely to be not significant.

Alternative 5

As described in the 2016 EA, compared to the existing about 100-mile section of pipeline that would require rerouting, the North Bismarck Reroute is close to or crosses multiple conservation easements, habitat management areas, National Wildlife Refuges, state trust lands, waterfowl production areas, and private tribal lands. As such, there are fewer recreational resources along the existing route. The construction of Alternative 5 would impede wildlife viewing, hiking, and other recreational activities, resulting in temporary and moderate impacts on recreational activities. Alternative 5 could also result in operational impacts on adjacent recreational areas in the event of a crude oil release.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Trucking or rail transportation would likely use existing infrastructure and would only result in impacts on recreation should an accident occur that releases crude oil near a recreation area. Given the myriad of pathways that trucking and rail could take, it is unknown whether any public recreation areas could be affected; however, any such crude oil release would be expected to be lower in volume and be able to be responded to quickly. Therefore, impacts on recreation from trucking and rail are expected to be temporary and minor, and not anticipated to be significant.

The abandonment of the existing pipeline may also result in minor disturbance to recreation for cutting and capping segments of the pipeline. If cutting and capping were to occur, existing recreational activities would be disturbed. These impacts would be temporary and minor. Recreational activities would return to current conditions once abandonment activities are complete.

In conclusion, construction and operational impacts on recreation from Alternative 5 would be temporary and moderate but would not be considered significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The combined construction and operational impacts on recreation for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on recreation for Alternatives 5 and 2 would not be significant.

3.7. Cultural Resources

Native American Tribes view resources of traditional and religious importance holistically. These resources of traditional and religious importance maintain the cultural identity of tribal communities and are part of the ongoing accumulation of knowledge about the relationships between tribal people and ecosystems. These resources may include, but are not limited to, sacred places, traditional hunting and gathering areas, animals, plants, and natural resources. When the Mainstem Dams were built, the tribal communities lost many places intrinsic to events in oral histories. This has affected every aspect of tribal lifeways: spiritual, psychological, physical, and emotional. These resources are important in maintaining the cultural identity of tribal communities. Historic trauma, including that associated with past USACE projects impacting the Missouri River, is discussed in Section 3.8.3, [Socioeconomics, Environmental Justice, and Health] Health.

During the scoping comment period, the SRST submitted a letter from Dr. Thomas King through the SRST THPO (see Appendix B, USACE and Other Letters) stating that this EIS uses the term "cultural resources" inaccurately based on a definition that they are locations and objects associated with or created by human activity. The USACE recognizes that the tribal definition of cultural resources may be broader than the regulatory definitions and could include culturally important natural resources. Natural resources used by Tribes are addressed in Section 3.8.2.5, [Socioeconomics, Environmental Justice, and Health; Current Affected Environment] Subsistence.

As described in Chapter 1, Introduction and Background, this EIS is being prepared in accordance with NEPA to consider environmental and cultural resources as part of federal decision making. In addition to NEPA, the Project must also be reviewed under Section 106 of the NHPA (54 USC § 300101 et seq.)

Generally, cultural resources are considered eligible to be designated as historic properties under Section 106 of the NHPA and the implementing regulations at 36 CFR Part 800. Section 106 requires federal agencies, including the USACE, to take into account effects of their undertakings on historic properties and to afford the ACHP an opportunity to comment. The criteria used for assessing impacts on the cultural environment under NEPA, specifically historic properties and properties of traditional religious and cultural importance to Tribes under Section 106, warrant clarification of how key terms are defined under NEPA and the NHPA (CEQ and ACHP, 2013).

In the APE[38] as defined within this EIS, a cultural resource includes historic properties, archaeological sites, historical architectural resources, and areas of traditional religious and cultural significance to Tribes. Resources, including those that are not property-based, may be considered by Tribes to have traditional religious and cultural significance without being designated a traditional cultural property, and federal agencies may treat them as a historic property accordingly.[39]

As used in this section, historic property is defined in the NHPA (54 USC § 300308) as any “prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion on” the National Register of Historic Places (NRHP) (36 CFR Part 60). Per Section 101(d)(6)(A) of the NHPA, properties of traditional religious and cultural significance to an Indian Tribe may be eligible for listing on the NRHP. An archaeological site, as defined by the NPS (2000) is “a location that contains the physical evidence of past human behavior that allows for its interpretation.” Historic architectural resources are those that postdate Native American contact with Europeans and include buildings, structures, objects, landscapes, districts, and linear features.

In Section 106, an adverse effect is found when an undertaking may directly or indirectly alter any characteristic that makes a historic property eligible for inclusion in the NRHP such that the historic property’s integrity would be diminished or lost entirely (36 CFR § 800.5). To resolve an adverse effect, the federal agency must consider ways to avoid the historic property. However, if the historic property cannot be avoided, measures to minimize or mitigate adverse effects must be developed.

Under NEPA, a significant impact is determined on the basis of context and intensity. Impacts are analyzed in several contexts (e.g., the affected interests and the locality), while intensity refers to the severity of effect, which includes issues such as the magnitude, geographic extent, duration, and frequency of the effect.

In this section, the NEPA significance criteria are defined with relation to the presence or absence of adverse effects on historic properties (see Table 3.7-1). Adverse effects on historic properties would be considered significant under NEPA; however, if the impact were minimized or mitigated, the impact would be reduced below the threshold of significance as defined by NEPA.

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[38] As defined in 36 CFR § 800.16(d), the area of potential effects means the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

[39] Per National Register Bulletin 38 (Parker and King, 1998), a traditional cultural property is generally defined as “one that is eligible for inclusion in the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community the National Register because of its association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community.”

Table 3.7-1: NEPA Significance Impact Analysis for Cultural Resources

Type of Impact	Impact Characteristics	Cultural Resources		
		Major	**Minor**	**No Impact**
Direct or indirect disturbance of cultural resources including an archaeological or architectural site, and tribally significant resources listed or eligible for listing in the NRHP	Intensity	Section 106 adverse effect on a historic property	Section 106 adverse effect on a historic property	No impact on cultural resource
	Duration	Permanent, without mitigation	Permanent, but impact minimized or mitigated	No impact on cultural resource
	Significance	Significant	Not significant	No impact

NEPA = National Environmental Policy Act; NRHP = National Register of Historic Places

This section provides the results and recommendations of cultural resources investigations conducted for the 2016 EA (USACE, 2016a) and an analysis of the affected area, impacts, and mitigation from the past and future Project activities under the five alternatives (see Chapter 2) on cultural resources. The regulatory authority under which cultural resources are being evaluated for the Project is described below. Section 3.7.1, Cultural and Historic Resources, describes the APE from Project construction and the first several years of operation, summarizes previously documented cultural resource surveys and sites in the Project vicinity and the results of cultural resource investigations, and discusses a plan for addressing unanticipated discoveries of cultural resources or human remains (UDP) during construction. Sections 3.7.1.2 and 3.7.2.1 below contain correspondence related to agency and tribal consultation for the Project. Section 3.7.3 describes potential impacts from future actions under each of the five alternatives.

3.7.1. Cultural and Historic Resources

The past affected environment is described in the Project Background (Section 3.7.1.1). Sections 3.7.2 and 3.7.3 address the current affected environment and associated impacts and mitigation, respectively.

3.7.1.1. Project Background: Affected Environment and Impacts

This section describes the APE as previously defined and in accordance with Section 106 of the NHPA, the results of literature reviews, and the results of the archaeological inventory conducted by the Dakota Access consultants. This section also includes a summary of the USACE consultations with the North Dakota State Historic Preservation Office (ND SHPO) and Tribes. The SRST provided a letter from its THPO, John Eagle Sr., stating that the APE should be extended to the exterior boundaries of the SRST reservation (Eagle, 2021). This EIS does not redefine the APE that was surveyed prior to construction of the Lake Oahe crossing. Potential impacts on resources of tribal concern (e.g., not historic properties) located outside the APE are discussed in Section 3.8.2, [Socioeconomics, Environmental Justice, and Health] Environmental Justice.

The USACE defined the APE as the locations associated with HDD construction activities. HDD construction at the Lake Oahe crossing was confined to privately owned lands outside of the federal property managed by the USACE, and no construction activities took place on federal lands at this crossing. However, since the action of placing the pipeline under federal lands was a permitted activity, the HDD construction was considered a federal undertaking and thus subject to the terms of the USACE Programmatic Agreement (USACE, 2004) and Section 106 review regardless of land ownership. Therefore, the APE included all bore pits, stringing areas, staging areas, and access routes even though located outside USACE-managed land, and did not include any portion of the pipeline alignment that extended past the bore pit locations.

There are five sites (32MO0060, 32MOx0570, 32MOX0004, 32EM0021, and 32EM0221) located within the APE and 36 previously recorded cultural resources located outside of the APE but within 1 mile of the Project. Two sites (32MO0060 and 32EM0021) were included in the APE due to their position in the Project corridor, but they were avoided during construction by the HDD. Two sites (32EM0221 and 32MOX0004) were included in the APE based on very broad legal descriptions for their locations when originally recorded. The actual location of these two sites is unknown.

Cultural resource personnel from the USACE, ND SHPO, and the SRST conducted on-site visits to the APE on September 28, 2015, March 7, 2016, and March 22, 2016. No cultural resources were identified during the September 2015 field visit. During the March 2016 field visits and as summarized in an April 22, 2016, letter the USACE sent to the SHPO (USACE, 2016b), the group identified two nearby recorded sites (32MO0054 and 32MO0001), visited a historic cemetery, observed one item of cultural importance, found four artifacts near the current boundary of recorded site 32EM0021 within the portion of the site previously impacted by cultivation and construction of the Northern Border pipelines, and found a single artifact in another location outside the APE. After the site visits, the SRST provided the USACE with a confidential report (Brave Bull Allard, 2016) containing sensitive information regarding areas and sites of concern they had recorded in the Project vicinity; as described in the letter sent to the SHPO, the USACE determined that these areas and sites were located outside the APE (USACE, 2016b). All information provided to the USACE is considered sensitive and is protected. Information that has been provided by Tribes to the USACE is not distributed or shared outside the USACE.

The APE was surveyed for archaeological resources between 2014 and 2016 by the Dakota Access consultants (Landt and McCord, 2016 as cited in USACE, 2016a). These surveys were conducted on private lands. No federal lands were surveyed for archaeological, architectural, or TCPs because no Project impacts were anticipated to occur between the HDD workspaces on either side of Lake Oahe. Additionally, the federal lands had been surveyed previously for other projects.

As described in the 2016 EA, the archaeological field inventory at Lake Oahe took place within the APE, exclusively on private lands (i.e., HDD workspaces and stringing area). The field inventory consisted of a combination of pedestrian survey and shovel probing. Archaeologists walked along fixed transects spaced 98 feet apart within the 400-foot-wide survey corridor and systematically excavated shovel probes across high probability settings or in areas with low surface visibility (Landt and McCord, 2016 as cited in USACE, 2016a).

The SRST letter from Dr. King notes that by conducting the survey as described above, tribal resources were not considered. The USACE consulted with Tribes to seek input on tribal resources of concern and conducted field visits on the USACE lands with representatives of the SRST. Based on the outcome of this consultation, the tribal areas of concern were determined to be outside of the APE. The SRST letter from Mr. Eagle noted that a tribal survey should have been conducted on the entire route. As is discussed in greater detail in Section 1.3, [Introductions and Background] Authority and Scope of EIS, the scope of this EIS is limited to the crossing of USACE federal lands at the Lake Oahe crossing, and the remaining portions of the pipeline are beyond the purview of this EIS.

The field inventory resulted in the documentation of one new archaeological site (32MOx570) that consists of one lithic flake. The eight previously relocated sites were either outside the direct APE and not impacted by the DAPL Project or were not relocated during survey. The results of the field inventory conducted by the Dakota Access consultants were summarized in a report included as Appendix I of the 2016 EA (USACE, 2016a). The USACE determined that site 32MOx570 is not eligible for listing in the NRHP. In a letter dated April 26, 2016, the ND SHPO concurred with the USACE determination that site 32MOx570 is not eligible for listing in the NRHP (SHPO and SHSND, 2016).

The geotechnical analysis performed to support the HDD crossing concluded that vibration related to construction and HDD activities was not anticipated to affect historic properties. A vibration monitoring analysis conducted by GeoEngineers in 2009 (GeoEngineers, 2009 as cited in USACE, 2016a) found that vibration propagated from a piece of construction equipment through the ground diminishes with distance, and the soil effectively attenuates or displaces the vibration. Therefore, vibrations associated with the drilling process were limited to within about 50 feet of the drilling equipment on the surface and downhole.

Dakota Access' UDP (see Appendix F of the 2016 EA) was used during all Project construction activities regardless of jurisdiction or land ownership. The UDP described actions that would take place if an undocumented cultural resource site was discovered during construction activities. The UDP explicitly called for work to stop until the correct authority or agency was contacted and the find properly evaluated. No new cultural resources (unanticipated finds) were identified during Project construction.

3.7.1.2. Past Consultations

The Section 106 process for Project construction was administered in accordance with stipulations identified in the Programmatic Agreement (USACE, 2004). The Programmatic Agreement was developed to address challenges associated with cultural and historic resource impacts involved with the ongoing operation and maintenance of the Missouri River system of main stem dams. This Programmatic Agreement outlines the processes through which affected Tribes, agencies, and interested parties are consulted by USACE on issues that may affect important historic and cultural resources. A current list of Programmatic Agreement points of contact is maintained and used for coordination and consultation efforts by the USACE; the distribution list includes 35 Tribes, agencies, and interested parties regardless of whether they signed the Programmatic Agreement. This consultation process is essential to USACE compliance with Section 106.

The U.S. Department of Defense (DoD) recognizes its trust responsibilities to federally recognized Indian Tribes and has established an American Indian and Native Alaskan Trust Policy that directs its agencies, including the USACE, to work with Tribes in a manner that incorporates tribal needs, traditional resources that may be defined as historic properties under Section 106 of the NHPA, stewardship practices, and the development of viable working relationships (DoD Instruction 4710.02, *DoD Interactions with Federally Recognized Tribes,* September 24, 2018). In addition, EO 13175, *Consultation and Coordination with Indian Tribal Governments* (65 Fed. Reg. 67249; 2000), outlines policy and criteria regarding the establishment of "regular and meaningful consultation and collaboration with tribal officials in the development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes..." The USACE seeks to work with Tribes on a government-to-government basis through consultation under its trust responsibilities as well as through other relevant federal laws, including Section 106 of the NHPA. As emphasized in the Programmatic Agreement (USACE, 2004), Tribes expect USACE to treat sacred and culturally significant places as subject to the trust responsibility. Therefore, consultation about cultural, sacred, natural, and visually important resources may be driven by the trust doctrine and Section 106. The Section 106 and Programmatic Agreement stipulations are essential to USACE compliance with federal trust responsibilities.

Section 106 consultation was initiated for this Project beginning in October 2014, with an information letter regarding a preliminary geo-testing of the proposed Lake Oahe crossing alignment (USACE, 2016a). Per the USACE-Omaha District's usual process, this letter was sent to the Tribes, agencies, and interested parties included in the Programmatic Agreement to solicit information relevant to this portion of the Project. On December 18, 2014, USACE sent a letter to the ND SHPO, with a copy sent to the Programmatic Agreement distribution list, providing its determination of effect for the geo-testing (USACE, 2014). On July 22, 2015, USACE sent a letter to appropriate contacts of the Programmatic Agreement distribution list to provide information regarding the HDD installation at the Lake Oahe pipeline crossing (USACE, 2016a). On April 22, 2016, USACE sent a letter to the ND SHPO, with a copy sent to the Programmatic Agreement distribution list, providing its determination of effect (USACE, 2016b). In a letter dated April 26, 2016, the ND SHPO concurred with the USACE determination of "No Historic Properties Affected" (SHPO and SHSND, 2016).

3.7.2. Current Affected Environment

New cultural resources investigations were not conducted on private or federal lands in the Project Area since publication of the 2016 EA. The ND SHPO issued new guidelines for archaeological investigations and reporting in 2020 (SHSND, 2020); however, the previous survey for the Project meets the standards provided in the new 2020 guidelines. Cultural resources investigations for this EIS may be conducted if warranted as described in Section 3.7.3, [Cultural Resources] Impacts and Mitigation.

3.7.2.1. Consultations with Tribes, THPOs, SHPOs, and Interested Parties

The Section 106 process for this Project followed the stipulations identified in the Programmatic Agreement (USACE, 2004). Government-to-government consultation is summarized in Section 1.6.1 [Introduction and Background] of this EIS.

In September 2020, Project scoping letters were sent to all Programmatic Agreement points of contact to initiate Section 106 coordination and consultation for the Project (see Appendix B, USACE and Other Letters). The intent of scoping was to provide a summary of the Project and solicit comments to assist in identifying the scope of potentially affected environmental, social, cultural, and economic issues relevant to the federal action and determining if there are other reasonable alternatives to be considered in the EIS.

Scoping comments on cultural resources and consultation included concerns about the impact of operations and maintaining the current easement without additional conditions on cultural and historic resources in general, and on tribal interests and resources of concern.

Several comments referred to the consultation participants and process, directing the USACE to adhere to Section 106 and EO 13175 and consult with Tribes to incorporate tribal perspectives on impacts on and protection of cultural resources important to Tribes.

Comments were received regarding compliance with Section 106 and the Native American Graves Protection and Repatriation Act (Pub. L. No. 101-601, 104 Stat. 3048 [1990]; 25 USC § 3001 et seq.; 25 USC § 32) as they relate to the protection of cultural resources and human remains. Commenters indicated the EIS should analyze cultural impacts of the pipeline, including the effects on tribal lands, burial grounds, and archaeological sites, and should include visual impacts on TCPs and the indigenous landscape. To assist in the evaluation of effects on TCPs, commenters requested the APE be surveyed for TCPs to maintain compliance with Section 106 (see Appendix B, USACE and Other Letters).

To date, impacts on archaeological sites, landscapes, tribal lands, and burials have not occurred within the Project Area. Government-to-government consultation between USACE and Tribes, including the request for a TCP survey, is ongoing and summarized in Section 1.6.1 [Introduction and Background].

In a letter to SHPO dated September 20, 2021, USACE provided information on the status of the Project and a summary of comments received to date from members of the public, Tribes, local and state government agencies, non-governmental organizations, and other stakeholders, and invited the SHPO to participate in a meeting to discuss this information.

In letters dated November 17, 2021, and November 30, 2021, the SHPO informed USACE that the Section 106 process has been followed, confirmed its determination of "No Historic Properties Affected," and no further review of the Project is required, confirming the Section 106 process is complete.

On March 2, 2022, USACE held an in-person government-to-government consultation meeting with the CRST, Oglala Sioux Tribe, SRST, Spirit Lake Nation, Santee Sioux Tribe, and Yankton Sioux Tribe. During this meeting, the CRST identified that differences exist between tribal interpretation of sacred sites and EO 13007, *Indian Sacred Sites* (61 Fed. Reg. 26771–26772; 1996). To date, the CRST has not identified specific sacred sites for USACE consideration in this EIS. USACE will continue to reach out to the Tribes for this information.

USACE consults with Tribes on a routine basis, during which Tribes have shared sensitive, broad, and specific sacred site information. Tribes view the environment wholistically as sacred, specifically water. The USACE has been provided these broad tribal viewpoints; however, no specific sacred information has been provided within the Project APE. The USACE will continue consultation efforts with Tribes.

3.7.3. Impacts and Mitigation

Five alternatives are considered with regard to their construction and operational impacts on cultural resources. A brief description of each alternative is included below; for additional details of each alternative, see Chapter 2.

For the selected alternative, the USACE will evaluate any adverse effects on historic properties identified under Section 106 that are located within USACE-administered lands or permitted locations and if adverse effects will also create a significant impact under the NHPA or NEPA. The USACE will assess mitigation measures that can be implemented in order to resolve adverse effects on historic properties that cannot be avoided.

3.7.3.1. Alternative 1

Under Alternative 1, the USACE would not grant an easement and would require restoration of USACE-administered federal lands to pre-pipeline construction conditions. This would include abandonment of the existing pipeline via removal.

This alternative would result in the excavation and removal of the pipeline from below and immediately adjacent to Lake Oahe. Construction impacts on known historic properties would not occur in workspace that falls within the previously surveyed area. However, new workspace outside the previously surveyed area would be required, including 1,400 acres needed for the temporary storage of dredge spoil. Cultural and historic resources could be impacted in these areas; therefore, additional cultural resources investigations would be required.

Any adverse effects on historic properties identified during new cultural resource investigations at Lake Oahe would need to be avoided, minimized, or mitigated. Also, Dakota Access' UDP would be used in the event that an undocumented cultural resource was discovered during construction activities (see Appendix F of the 2016 EA) and the *U.S. Army Corps Of Engineers* [Standard Operating Procedure] *SOP Response Procedures for Discovery of Human Skeletal Remains* (SOP) would be used in the event of the discovery of human remains on USACE-managed land (USACE, 2016c). As described in the SOP, the USACE will treat human skeletal remains respectfully and responsively in consultation with affected Tribes and in accordance with the North Dakota Intertribal Reinterment Committee Memorandum of Agreement, Native American Graves Protection and Repatriation Act, the NHPA, and other applicable federal, tribal, state, and local laws.

Therefore, the impact on cultural resources would not be significant.

Prior to removal, the pipeline would be shut down and there would be no impacts on cultural resources as a result of this shutdown.

If Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

3.7.3.2. Alternative 2

Under Alternative 2, the USACE would not grant an easement and Dakota Access would abandon the pipeline in place. The pipeline would be removed from service with limited construction activity in order to purge and cap the pipeline. All construction workspace would be within previously surveyed locations where no historic properties were identified; therefore, impacts on historic properties are not anticipated. However, if any new construction workspace would be needed outside of the previously surveyed area, cultural and historic resources could be impacted and additional survey would be required.

If impacts on historic properties would be unavoidable, impacts would be minimized or mitigated before construction activities to comply with Section 106; therefore, the impact on cultural resources would not be significant.

Dakota Access' UDP would be used in the event that an undocumented cultural resource site was discovered during construction activities, and the USACE SOP would be used in the event of the discovery of human remains on USACE-managed land.

Prior to removal, the pipeline would be shut down and there would be no impacts on cultural resources as a result of this shutdown.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

3.7.3.3. Alternative 3

Under Alternative 3, the USACE would grant the requested easement with the same conditions as the vacated easement. No construction activity is associated with Alternative 3; therefore, no impacts on historic properties are anticipated.

Normal operations activities would not impact known historic properties.

Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation] Alternative 3, details 18 modeled release scenarios. The likelihood of a WCD release during pipeline operation is remote to very unlikely. In the event of a WCD crude oil release under the modeled scenarios, the magnitude of the impact would be dependent on geographic extent of the release and whether a previously identified cultural resource was present. If a release did occur, and assuming that physical barriers are installed to protect cultural resources by eliminating or at least minimizing the amount of oil that comes into direct contact with a cultural resource, as well as providing a physical means of collecting oil or separating the oil from the resource, the impacts on cultural resources would be minor. If a release were to occur that impacts known sites, the USACE would work with SHPO, Tribes, and Dakota Access to assess the impact on the site and identify any critical areas needing immediate protection. Once the damage assessment is complete, the USACE would consult with tribal and state partners to develop mitigation measures. Therefore, the overall risk of impacts on cultural resources from a crude oil release is negligible.

In conclusion, construction and operation impacts (including the risk of a crude oil release) on cultural resources associated with Alternative 3 would not be significant.

3.7.3.4. Alternative 4

Under Alternative 4, the USACE would grant the requested easement with additional conditions beyond those in the vacated easement. Additional conditions on the easement under Alternative 4 would be focused on earlier detection of a release and improved response times to a release.

No construction activity is associated with Alternative 4; therefore, no impacts on historic properties are anticipated. However, the USACE would work with affected Tribes, agencies, and interested parties identified in the Programmatic Agreement (USACE, 2004) to develop a mitigation plan to address impacts on historic properties if Alternative 4 is selected.

Generally, impacts associated with operation of the pipeline under Alternative 4 would be similar to those under Alternative 3. In the event of a crude oil release under the modeled scenarios, impacts on cultural resources would be similar to those described for Alternative 3.

In conclusion, construction and operation impacts (including the risk of a crude oil release) on cultural resources associated with Alternative 4 would not be significant.

3.7.3.5. Alternative 5

Under Alternative 5, the USACE would not grant an easement, and an approximately 111-mile-long reroute (the North Bismarck Reroute) would be constructed. This would require ground disturbance along the new route; therefore, a cultural resource investigation of the USACE-defined APE may be needed in USACE-permitted areas or on USACE-managed land. The North Bismarck Reroute as currently identified is not located on USACE-managed land.

Any adverse effects on historic properties identified during new cultural resource investigations in USACE-permitted areas along the North Bismarck Reroute would need to be avoided, minimized, or mitigated. Also, Dakota Access' UDP would be used in the event that an undocumented cultural resource was discovered during construction activities, and the USACE SOP would be used in the event of the discovery of human remains in USACE-permitted areas. In those locations where survey may not be required because they are outside the USACE-defined APE, cultural resources could be impacted by construction activity.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. The Lake Oahe pipeline crossing would be removed from service under either Alternative 1 or 2. Under Alternative 1, if any new construction workspace would be needed outside of the previously surveyed area in the USACE APE, cultural and historic resources could be impacted and additional survey would be required. Under Alternative 2, all construction workspace would be within previously surveyed locations where no historic properties were identified; therefore, impacts on historic properties would not be anticipated for this activity.

If impacts on historic properties would be unavoidable, impacts would be minimized or mitigated before construction activities to comply with Section 106; therefore, the impact on cultural resources would not be significant. Dakota Access' UDP would be used in the event that an undocumented cultural resource was discovered during construction activities, and the USACE SOP would be used in the event of the discovery of human remains in USACE-permitted areas.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

Dakota Access would likely seek to transport the oil using rail and/or trucking while the North Bismarck Reroute is permitted and constructed. This EIS assumes that Dakota Access would use existing transportation infrastructure and would not build new railways or roads. If a crude oil release occurs during rail or truck transportation, the magnitude and significance of the impact is dependent upon the geographic extent of the release, the cultural resource affected, and cleanup response time. Surface and subsurface hydrocarbon contamination in a recorded archaeological site could adversely affect radiocarbon dating (if carbonized material was present); if absorbed in ceramics, it could affect residue studies. Should historic buildings or materials be exposed to crude oil, the nature of the impacts would depend on the type of material exposed and length of exposure to the oil. For example, wood might be stained or brick mortar may be chemically affected by sulphur-containing chemicals in crude oil that could lead to mortar decay.

If a release occurred, the impacts on cultural resources would be minor assuming that 1) physical barriers are installed to minimize the amount of oil that comes into direct contact with the cultural resource and 2) oil is collected and physically separated from the cultural resource.

In conclusion, because Alternative 5 would primarily be outside USACE jurisdiction unidentified cultural resources could be impacted and construction and operation impacts on cultural resources associated with Alternative 5 could be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The combined construction and operation impacts on cultural resources for Alternatives 5 and 1 or Alternatives 5 and 2 could be significant.

3.8. SOCIOECONOMICS, ENVIRONMENTAL JUSTICE, AND HEALTH

This section summarizes and analyzes impacts on the local population and economy, environmental justice communities, and health affected by the Project.

3.8.1. Socioeconomics

This section discusses population demographics, housing occupancy data, public services, economic and employment characteristics for the counties crossed by the Project, including Morton and Emmons counties. It primarily relies upon the 2020 American Community Survey 5-year estimates, released in March 2022 as this is the most recent population data available from the U.S. Census Bureau. Sections 3.8.1.2 and 3.8.1.3 address the current affected environment and associated impacts and mitigation, respectively.

While environmental justice evaluations are part of the larger socioeconomic analysis, the Socioeconomics section analyzes potential impacts of the overall social and economic character of the Project Area. The data used in this analysis was prepared based on a variety of publicly available data and encompasses Morton and Emmons counties. Section 3.8.2, Environmental Justice, is focused on the identification of populations of color and low-income populations (e.g., Sioux County) and analyzing whether the Project would have disproportionately high and adverse environmental effects on these populations.

3.8.1.1. Project Background: Affected Environment and Impacts

The Project Area crosses Lake Oahe in Emmons and Morton counties. Two census tracts—CT9665 in Emmons County and CT204 in Morton County—are crossed and were included in the 2016 EA analysis. Sioux County borders the Missouri River to the west, is south of the Lake Oahe crossing, and is discussed in Section 3.8.2, Environmental Justice.

Population and Demographics

In 2016, the majority population in Emmons and Morton counties was primarily white. Emmons and Morton counties did not include minority or low-income populations that fall under the definition of an environmental justice community per best practice guidelines (IWG, 2019) and therefore are not discussed in Section 3.8.2.

Economy and Employment

The top three industries providing employment in CT9665 in Emmons County were agriculture followed by educational services, health care and social assistance fields, and then construction. Educational services, health care and social assistance were the leading industry employers in CT204 in Morton County followed by agriculture and retail trade. Overall, the DAPL Project created about 12,000 construction jobs across five states. These construction jobs were estimated to create considerable labor income and state income tax revenue, including the generation of more than $13.4 million in ad valorem taxes.[40] In 2020, the DAPL Project generated approximately $37.2 million in property taxes, with approximately $1.7 million coming from Morton and Emmons counties. Given that the Lake Oahe crossing was constructed a part of the DAPL Project, impacts on the economy and employment from the construction of the Lake Oahe crossing, specifically, are unknown.

3.8.1.2. Current Affected Environment

This analysis focuses primarily on the counties and census tracts where the Lake Oahe crossing occurs. The most current U.S. Census Bureau demographic and income statistics are included in this assessment. The same counties and census tracts identified in Section 3.8.1.1 continue to be analyzed in this EIS. Sioux County, which contains the SRST Reservation, is included in a detailed analysis of environmental justice communities in Section 3.8.2, Environmental Justice.

Population and Demographics

Updated demographic information including population and income for the affected census tracts, counties, and the state of North Dakota are provided in Tables 3.8.1-1 and 3.8.1-2. Population and income statistics are not significantly different from the information included in the 2016 EA.

The majority population in Emmons and Morton counties is white. Emmons and Morton counties do not include minority or low-income populations that fall under the definition of an environmental justice community. A comparison of the U.S. Census Bureau's 2015 and 2020 population estimates shows that North Dakota and Morton County had population increases, while Emmons County experienced a population decrease (U.S. Census Bureau, 2015a and 2020a).

[40] Ad valorem means "according to value or in proportion to value" such as real estate or personal property (North Dakota Century Code § 57-02). Therefore, ad valorem taxes are taxes based on the assessed value of an item; the most common ad valorem taxes are property taxes levied on real estate.

Table 3.8.1-1: Minority and Low-Income Population Statistics

Geographic Area	Total Population [a]	White Alone [a]	Black or African American Alone [a]	American Indian and Alaska Native Alone [a]	Asian Alone [a]	Native Hawaiian and Other Pacific Islander Alone [a]	Some Other Race [a]	Two or More Races [a]	Hispanic or Latino	Total Minority Population [a]	Persons Below the Poverty Level [b]
State											
North Dakota	760,394	83.7%	3.1%	4.9%	1.6%	0.1%	0.2%	2.5%	4.0%	16.3%	11.4%
Counties / Census Tracts (CTs)											
Morton	31,118	89.4%	1.2%	3.3%	0.7%	0.1%	0.0%	1.6%	3.7%	10.6%	8.8%
CT204	3,138	96.4%	0.0%	0.1%	0.0%	0.0%	0.0%	0.9%	2.5%	3.6%	6.7%
Emmons	3,262	96.8%	0.0%	0.7%	1.1%	0.0%	0.2%	0.5%	0.8%	3.2%	11.6%
CT9665	3,262	96.8%	0.0%	0.7%	1.1%	0.0%	0.2%	0.5%	0.8%	3.2%	11.6%

[a] Source: U.S. Census Bureau, 2020a
[b] Source: U.S. Census Bureau, 2020b
Note: Totals may not sum across the table due to rounding used in data collection.

Table 3.8.1-2: Population Information

Geographic Area	Population		Population Percent Change	Population Density	Land Area
	2015 [a]	2020 [b]	(2015 to 2020)	(persons/mi^2)	(mi^2) [c]
State					
North Dakota	721,640	760,394	+5.3	11.02	69,001
Counties					
Morton	28,985	31,118	+7.3	16.15	1,926
Emmons	3,463	3,262	-5.8	2.16	1,510

[a] Source: U.S. Census Bureau, 2015a
[b] Source: U.S. Census Bureau, 2020a
[c] Source: World Media Group, LLC, 2021
mi^2 = square mile

Economy and Employment

Income, labor, unemployment, and occupational information are included in Table 3.8.1-3. The unemployment rate decreased between 2015 and 2020 in Morton and Emmons counties (U.S. Census Bureau, 2015b and 2020c).

The top three industries providing employment in Emmons County are similar to those included in the 2016 EA: "agriculture" tied with "educational services, health care, and social assistance" remain the top two industries, while the third top industry is now "retail trade" instead of "construction."

The top three industries providing employment in Morton County are also similar to those included in the 2016 EA: "Educational services, health care, and social assistance" and "retail trade" remain the top two industries, while the third top industry is "construction" instead of "agriculture."

Table 3.8.1-3: Income, Labor, Unemployment, and Occupational Information

Geographic Area	Median Per Capita Income [a]	Labor Force (number) [a]	Unemployment Rate (percent) [a, b]		Top Occupations [a]
	2020 dollars	2020	2015	2020	2020
State					
North Dakota	$36,289	421,736	2.9	3.1	• Educational services, health care, and social assistance • Retail trade • Agriculture, forestry, fishing and hunting, and mining
Counties / Census Tracts (CTs)					
Morton	$39,890	18,021	3.2	2.0	• Educational services, health care, and social assistance • Retail trade • Construction
CT204	$42,939	1,897	2.6	1.4	• Agriculture, forestry, fishing and hunting, and mining • Educational services, health care, and social assistance • Retail trade
Emmons	$32,294	1,544	3.6	1.9	• Agriculture, forestry, fishing and hunting, and mining • Educational services, health care, and social assistance • Retail trade
CT9665	$32,294	1,544	3.6	1.9	• Agriculture, forestry, fishing and hunting, and mining • Educational services, health care, and social assistance • Retail trade

[a] Source: U.S. Census Bureau, 2020c
[b] Source: U.S. Census Bureau, 2015b

Housing and Public Services

Table 3.8.1-4 details the total number of housing units, available housing units, and vacancy rates for the counties which Alternatives 1, 2, and 5 affect (Burleigh, Emmons, Mercer, Morton, and Oliver counties). Alternatives 3 and 4 would not require additional housing.

Table 3.8.1-4: Available Housing

State/County	Total Housing Units [a]	Total Rental Units [b]	Occupied Rental Units [a]	Available Rental Units [c]	Rental Vacancy Rate [a]
Burleigh	43,022	13,162	12,003	1,159	8.8%
Emmons	2,153	333	301	32	9.5%
Mercer	4,824	823	607	217	26.3%
Morton	15,204	4087	3,923	164	4.0%
Oliver	1,006	113	83	30	26.5%

[a] Source: U.S. Census Bureau, 2020d. The U.S. Census Bureau definition of a housing unit is, "a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters."
[b] Total Rental Units was calculated by multiplying the non-vacancy rate times the Occupied Rental Units, then taking the sum of this number and the Occupied Rental Units and rounding up to the nearest whole number.
[c] Available Rental Units was calculated by multiplying the Rental Vacancy Rate times the Total Rental Units and rounding up to the nearest whole number.

In addition to rental units, multiple forms of temporary housing are available to help meet the need for worker housing for the proposed construction activities. There are 34 hotels and 19 recreational vehicle (RV) parks and campgrounds available to provide temporary housing needs in Mercer, Oliver, Morton, Burleigh, and Emmons counties. The majority of the hotels are located within the cities of Bismarck and Mandan; there are 29 hotels with 2,953 rooms total within the cities of Bismarck and Mandan (Bismarck Mandan CVB, 2021).

Table 3.8.1-5 provides a description of the quantity of public services located around the Project. The table shows the quantity of public schools, fire departments, police departments and sheriff's offices, and hospitals, including the number of hospital beds present for each location. Additional information on public services is provided below. State information is not included in the assessment of public services, as local infrastructure would service any events that occur around the Project.

Table 3.8.1-5: Public Service Infrastructure near the Project

County	Public Schools (number) [a]	Professional Fire Departments (number) [b]	Police Departments and Sheriffs Offices (number) [c]	Hospitals (number) [d]	Hospital Beds (number) [e]
Mercer	6	2	3	1	13
Oliver	2	0	1	0	0
Morton	21	1	2	1	41
Burleigh	31	1	2	2	458
Emmons	7	1	2	1	20 [f]
Total	**67**	**5**	**10**	**5**	**532**

[a] Source: NCES, 2021a, 2021b, 2021c, 2021d, 2021e, 2021f, 2021g
[b] Source: USA Fire and Rescue, 2021
[c] USACOPS, 2021
[d] Center for Rural Health, 2021
[e] American Hospital Directory, 2021
[f] Center for Rural Health, 2016

Education

Mercer County and Oliver County have relatively few public schools. There are six schools in Mercer County, which served approximately 1,312 students from 2019 to 2020 (NCES, 2021c), and two public schools in Oliver County that served approximately 250 students from 2019 to 2020 (NCES, 2021e). Morton County is slightly larger, with 21 public schools for their 30,000 residents (NCES, 2021d). Burleigh County has one of the largest school districts in the state, with 31 public schools serving the nearly 93,000 residents located near the state capital of Bismarck (NCES, 2021a). In Emmons County, seven schools served approximately 546 students from 2019 to 2020 (NCES, 2021b).

Public Safety

Mercer County has three law enforcement departments: the Mercer County Sheriff's Office, the Beulah Police Department, and the Hazen Police Department (USACOPS, 2021). Oliver County is the smallest county and only the Oliver County Sheriff's Office serves it (USACOPS, 2021). The Morton County Sheriff's Office and the Mandan Police Department, both located in the city of Mandan, North Dakota, serve Morton County (USACOPS, 2021). Burleigh County law enforcement consists of one police department and one sheriff's office (USACOPS, 2021) located in the State's capital, Bismarck. Additionally, the North Dakota State Highway Patrol office (NDHP, 2019), a U.S. Marshals Service office (U.S. Marshals Service, n.d.), a U.S. Drug Enforcement Agency office (U.S. Drug Enforcement Administration, n.d.), and a Criminal Investigation Bureau (U.S. Department of Justice, 2020) are all located within Bismarck city limits. Emmons County law enforcement consists of the Emmons County Sheriff's Office and the Linton Police Department, which are both located in the city of Linton, North Dakota (USACOPS, 2021).

In terms of fire safety, the nearest fire department is located in downtown Fort Yates as part of the Fort Yates Fire Protection District. They provide fire protection and other emergency response services to the surrounding community. The Beulah Fire Department and the Hazen Fire Department serve Mercer County. No fire departments exist in Oliver County. The Mandan Fire Department exclusively serves Morton County. The Bismarck Fire Department is located in Burleigh County. For Emmons County, the Linton Fire Department provides fire protection (USA Fire and Rescue, 2021).

Health Care

The Sakakawea Medical Center in Hazen is the only hospital in Mercer County, with 13 staffed hospital beds and a 34-bed licensed basic care facility. There are no hospitals located in Oliver County (Center for Rural Health, 2021). The next nearest hospital by proximity to the Project is Vibra Hospital of the Central Dakotas in Mandan, Morton County. The hospital is located approximately 40 miles from the Project and provides 41 beds in total. Just across the river from Vibra Hospital, in Burleigh County, are the two hospitals located in Bismarck. Sanford Medical Center and Catholic Health Initiatives St. Alexius Health Bismarck are the largest hospitals in the extended area with 225 and 233 staffed beds, respectively (Center for Rural Health, 2021). For any complex health emergencies or any incidents involving large numbers of impacted people, one of these hospitals would be the recommended choice. The hospitals are both located approximately 45 miles from the Project.

In Emmons County, the Linton Hospital and Linton Medical Center form the main health care infrastructure for the county. The Linton Hospital contains a total of 14 acute beds and six observation beds (Center for Rural Health, 2016). By direct measurement, the hospital is around 20 miles from the Project. However, due to infrequent bridge locations across the Missouri River in this area, it would effectively take closer to 100 miles to travel there from the Project location, as one would have to travel north to take the bridge in Bismarck-Mandan.

3.8.1.3. Impacts and Mitigation

Five alternatives are considered with regard to their construction and operations impacts on socioeconomic conditions in Morton and Emmons counties. Although the review of socioeconomic impacts centers on the county and local levels, state impacts are also considered with respect to economic effects as the state does directly benefit economically from the Project.

Alternative 1

Alternative 1 would require the pipeline to be shut down and would require extensive construction to abandon the existing pipeline by removal and restore the environment to its pre-existing condition. Dakota Access determined it would need to conduct excavation in the lake bed that would undermine the integrity of the Northern Border pipelines crossing of Lake Oahe, which is within 100 feet and parallel to the Project pipeline. The relocation of Northern Border's natural gas pipelines would require authorization from FERC and is not analyzed in this EIS.

Dakota Access estimates it would take 6 to 20 years or more to abandon the pipeline by removal and finalize restoration, which therefore represents a long-term impact. Construction activities associated with the abandonment of the pipeline (i.e., removal and restoration) would create no permanent jobs, approximately 750 temporary direct jobs, and 2,200 temporary indirect jobs (based on a shorter duration of 3 years of construction).

Based on the estimate of the 2020 tax revenue, Morton and Emmons counties would receive approximately $1,789,914 in ad valorem taxes from the continuing operation of the Project; this tax would not be collected in the future if the pipeline is abandoned by removal, creating a long-term minor adverse impact on the economy.

Table 3.8.1-4 details the total number of housing units, available housing units, and vacancy rates for Mercer, Oliver, Morton, Burleigh, and Emmons counties. In addition to rental units, multiple forms of temporary housing are available to help meet the need for worker housing for the proposed construction activities, including hotels, RV parks, and campgrounds. Through the utilization of both rental housing and temporary housing using hotel, RV parks, and campgrounds, Morton, Burleigh, and Emmons counties should be able support the construction workforce for the duration of construction (6 to over 20 years). The influx of workers for Alternative 1 would result in a long-term, minor beneficial impact by increasing revenue for local housing as well as increasing tax revenue for the counties.

None of the five medical centers in the Project Area are identified as having shortage in the physician-to-population ratio. Therefore, it is likely that the medical centers are currently not exceeding medical care capacity and would support the medical needs of the temporary workforce needed for Alternative 1. The influx of workers would put a long-term minor strain on medical and emergency services either through emergency response to construction-related emergencies and injury or illness of the workforce. The Bureau of Labor Statistics reported the 2020 incidence rates of the number of injuries and illnesses per 100 full-time workers in oil and gas pipeline and related structures construction was 0.6, compared to construction overall with a 2.5 incidence rate (BLS, 2021). With an estimated 750 temporary direct jobs, Project-related increase in medical demand should not exceed the surrounding communities' medical capacity.

The local economics of Morton, Emmons, and Mercer counties would experience long-term minor beneficial effects through increased spending, and subsequent generation of state and local tax revenue, by construction employees working on the pipeline abandonment by removal and subsequent restoration.

No demographic changes in the census tracts affected for Morton or Emmons counties are anticipated because no permanent employment would be created.

In response to an information request sent by the USACE, Dakota Access provided the following information indicating the indirect economic losses resulting from the shutdown, abandonment, and removal of the pipeline from service. Removing the existing pipeline from service for even a temporary or short period of time while other transportation options are developed would result in the need to shut-in wells and decrease production. The projected losses associated with well shut-in include:

- Financial losses:
  - $3.81 billion to $5.95 billion in revenue losses caused by the shut-in of wells and production;
  - Lost royalty payments to landowners due to unproductive mineral assets as local landowners in North Dakota are not able to sell crude oil and natural gas and earn revenues and royalties from shut-in wells;
  - Increased supply costs for refiners, who pass the costs on to consumers and other end users;
  - A combined $45 to $65 million in property tax losses in Iowa, North Dakota, South Dakota, Louisiana, Mississippi, Tennessee, Kentucky, Illinois, Arkansas, and Texas;
  - Up to $2 billion in lost oil and gas extraction and production tax revenues in North Dakota over a 2-year budget period;
  - Millions of dollars in lost tax revenues annually to the Three Affiliated Tribes of the Fort Berthold Reservation; and
  - Millions of dollars in capital costs and contractual commitments incurred by upstream (producers/shippers) and downstream (refiners) customers that have structured their businesses around the DAPL Project operation and associated tax revenue.
- Job losses:
  - 4,520 to 7,063 direct job cuts by North Dakota producers as a result of shut-in production, including the shutdown of at least four to five drilling rigs in North Dakota, resulting in the loss of 600 to 750 full-time rig jobs;
  - Long-term job losses by third-party service vendors such as maintenance contractors, utility companies, trucking companies, and oil field service companies;

- Job losses by refinery workers; and
- Revenue losses due to shifting transport of oil from the pipeline to the limited available railcar capacity would force farmers and processors to go out of business, eliminating jobs in the agriculture industry, particularly in the Upper Midwest states (Minnesota, North Dakota, Montana, and South Dakota).

Current economic forecasts are highly unpredictable with the rapidly changing landscape of oil prices and production, but current forecasts from the Energy Information Administration show oil production on the rise in the United States through 2024 (EIA, 2023). The State of North Dakota (State) forecasted that a loss of $2 billion in tax revenue over a 2-year budget period would constitute a 20 percent decline in the State's general fund revenues. This loss would considerably reduce the funding that the State allocates to cities, counties, tribal governments, public schools, social services, and essential infrastructure further straining the State's ability to cover its financial obligations.

The State would lose tax revenue from the Project while oil is not flowing through the pipeline. A shutdown of the pipeline, even temporarily, under Alternative 1 would result in a reduction of crude oil production of 427,000 to 513,000 barrels per day for a period of 6 to 9 months. Based on a March 2023 North Dakota executive revenue forecast, a North Dakota crude oil price of $65 to $75 per barrel was expected for that period. The resulting additional loss in tax revenue to the State would range from approximately $500 million to $970 million during that timeframe (Morrissette, 2023). The State has also forecasted a reduction in state revenues by at least $256,000 per day, or $187 million over the course of the July 1, 2023, through June 30, 2025 (2023-25 biennium) budget period, assuming oil production of 1.1 million barrels per day and an increase in transportation costs of $2.33 per barrel. This loss would considerably reduce the funding that the State allocates to cities, counties, tribal governments, public schools, social services, and essential infrastructure. Further, recent oil prices have superseded this forecast, as they increased to roughly $60 per barrel since March 2021 and $100 per barrel from March 2022 through July 2022, exceeding pre-pandemic highs in 2018 and 2019 (EIA, 2022).

The State further explained that shutting down the pipeline and implementing Alternative 1 would inflict unrecoverable losses to the oil and gas industry in the state, and those losses would radiate outward to third parties who were uninvolved in the decision to build and operate the pipeline. The State argues that Alternative 1 would result in the loss of hundreds of jobs in North Dakota due to the shut in of wells and the closure of drilling rigs. Dakota Access provided information in response to a data request indicating that there may also be impacts on national socioeconomics should Alternative 1 be selected. Dakota Access believes that short-term drops in the supply of crude oil from the DAPL Project would eventually be filled by other sources at the national level, but at higher prices, resulting in long-term negative socioeconomic impacts. Overall, the DAPL Project is not a driver for national oil production and in the longer term the amount of production and ultimate consumption would remain the same. The State of North Dakota explained that the State may experience a long-term socioeconomic downswing that takes years to decades to turn around.

Alternative 1 would also reduce full-time jobs from closures of oil rigs in North Dakota by 600 to 700 jobs.[41]

Overall, Alternative 1 would result in major and long-term to permanent, adverse impacts on the local and state economies due to job loss and loss of tax revenue. As such, the numerous long-term to permanent impacts on local economies of Alternative 1 would result in significant adverse socioeconomic impacts.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment by removal of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are also likely to include constructing and operating the North Bismarck Reroute. The combined impacts of Alternatives 1 and 5 are described under Alternative 5 below.

Alternative 2

The limited construction activity would create approximately 30 temporary direct jobs and no temporary indirect or permanent jobs over the expected 30-day construction window. This would result in increased local and state hospitality and tax revenues; however, the limited number of temporary jobs would create a negligible benefit on the economy.

Because Dakota Access would abandon the pipeline in place and remove it from service, the overall economic impacts on the local and state economies would be the same as Alternative 1 resulting in significant adverse direct and indirect socioeconomic impacts.

Similar to Alternative 1, Alternative 2 would likely result in the construction and operation of a pipeline reroute, such as the North Bismarck Reroute described in Alternative 5 below. The combined impacts of Alternative 2 and 5, are described under Alternative 5 below.

Alternative 3

As no construction would occur with Alternative 3, there would be no additional socioeconomic impacts on the local communities beyond those from the past Project construction. Additionally, no demographic changes in the affected U.S. census tracts or the counties represented in the geographical area are anticipated because no permanent employment would be created as a result of Alternative 3.

Individual monitors would perform routine visual inspection and valve maintenance twice per month. No impacts on socioeconomic conditions would result from routine operations and maintenance. Routine inspection of the valve would be a long-term activity, but the impact of one individual on the local economy would be negligible.

With continued operation of the pipeline, the adverse socioeconomic impacts identified under Alternatives 1 and 2 would not occur, and there would continue to be major socioeconomic benefits at the local or state level. Further, based on the estimate of the 2020 tax revenue, Morton and Emmons counties

[41] Amicus Brief of the State of North Dakota in Support of Defendants and Opposing Vacatur of Easement, in United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB, filed April 29, 2020.

would continue to receive approximately $1,789,914 per year in ad valorem taxes from the continuing operation of the Project.

As described in Section 3.3.1.3, [Water Resources, Surface Waters, Impacts and Mitigation] Alternative 3, the PHMSA and FRP Modeling Reports (Appendix G) include SIMAP modeling to determine the predicted levels of unmitigated contamination that may be experienced at water intakes located upstream and downstream of the modeled release point in both ice-free and ice-covered conditions. In the event of a WCD crude oil release from the pipeline into Lake Oahe, irrigation water and livestock drinking water drawn from the lake at agricultural water intakes could become contaminated and contaminate agricultural fields and harm livestock (see Section 3.3.1, [Water Resources] Surface Waters, and Section 3.1, Reliability and Safety). Costs associated with lost or ill livestock and lost crop production would be a temporary but major impact on affected landowners. Dakota Access would be responsible for the associated costs of remediation and reimbursement of lost crop production or livestock, per The Oil Pollution Act of 1990.

A WCD crude oil release would also cause short-term and moderate to major impacts on recreation (see Section 3.6.3, [Land Use and Recreation] Recreation and Special Interest Areas) and thus impacts on the associated tourist economy would also be short-term and moderate to major.

However, given that the occurrence of a WCD crude oil release at the Lake Oahe crossing is remote to very unlikely, the risk of impacts on the associated tourist economy is negligible to moderate.

The major, permanent socioeconomic benefits when considered against the minor to moderate risk of a WCD crude oil release continues to present an overall significant beneficial impact on socioeconomics.

Alternative 4

As no construction would occur with Alternative 4, there would be no additional socioeconomic impacts on the local communities beyond those from the past Project construction. Additionally, no demographic changes in the affected U.S. census tracts or the counties represented in the geographical area are anticipated because no permanent employment would be created.

Individual monitors would perform routine visual inspection and valve maintenance twice per month. No impacts on socioeconomic conditions would result from routine operations and maintenance. Routine inspection of the valve would be a long-term activity, but the impact of one individual on the local economy would be negligible.

With continued operation of the pipeline, the adverse socioeconomic impacts identified under Alternatives 1 and 2 would not occur and there would continue to be a major beneficial socioeconomic impact.

The types of impacts from a crude oil release would be the same as for Alternative 3 discussed above. However, as discussed in Section 3.1.6.4, [Reliability and Safety, Impacts and Mitigation] Alternative 4, additional mitigation measures, more advanced leak detection and protection, and more stringent conditions would further reduce the risk and impact of a release.

In conclusion, pipeline operation associated with Alternative 4 would provide an overall significant beneficial impact on socioeconomics.

Alternative 5

Construction of the North Bismarck Reroute would create temporary jobs and increase local and state hospitality and tax revenues over the course of the 8 to 12 months of construction. Dakota Access estimates the North Bismarck Reroute would result in the creation of approximately 1,050 temporary jobs and 4,200 temporary indirect jobs. The temporary workers would also contribute a beneficial increase to labor income, state income tax revenue, and spending within local economies.

The total number of housing units, available housing units, and vacancy rates for the counties impacted by Alternative 5 (Mercer, Oliver, Morton, Burleigh, and Emmons counties) are detailed in Table 3.8.1-4, above. Though vacant rental units could be utilized to house many of the temporary employees, there is not currently enough rental vacancy to support the entire temporary workforce. However, in addition to rental units, multiple forms of temporary housing would need to be utilized to help meet the need for worker housing for the duration of the permitting and construction activities associated with Alternative 5. Through the utilization of both rental housing and temporary housing using hotel, RV parks, and campgrounds, Mercer, Oliver, Morton, Burleigh, and Emmons counties should be able support the construction workforce. The influx of workers for Alternative 5 would result in a short-term, minor, beneficial impact on housing.

Under Alternative 5, the total ad valorem taxes for Mercer, Oliver, Morton, Burleigh, and Emmons counties are estimated to be $3,208,916 per year. Overall, this would result in a net gain in ad valorem tax revenue after accounting for all gains and losses for the affected counties. However, ad valorem taxes associated with the North Bismarck Reroute would change the distribution of taxes to be paid by Dakota Access based on the miles of pipeline per county (see Table 3.8.1-6). This would result in an estimated revenue reduction of approximately 15 percent for Mercer County, and an estimated revenue reduction of almost 80 percent for Morton County. Emmons County would receive approximately twice as much revenue, while Oliver and Burleigh counties would receive new tax revenue from Alternative 5.

Table 3.8.1-6: Ad Valorem 2020 Tax Estimates

	Mercer County	Oliver County	Morton County	Burleigh County	Emmons County	Total
Alternative 3 or 4	$535,839	$0	$1,090,321	$0	$699,593	$2,325,753
Alternative 5	$470,526	$538,442	$148,469	$700,887	$1,350,592	$3,208,916
Net change under Alternative 5*	*-$65,313*	$538,442	*-$941,852*	$700,887	$650,999	$883,163

Note: Loss in tax revenue is italicized.

Additional tax revenues generated by the North Bismarck Reroute would support community services. The Bismarck region has adequate hospitality and public services to meet the needs of non-local workers who would relocate temporarily.

None of the five medical centers that would serve workers along the reroute are identified as having shortage in the physician-to-population ratio (Health Resources & Services Administration, 2021). Therefore, it is likely that the medical centers are currently not exceeding medical care capacity and would support the medical needs of the temporary workforce needed for Alternative 5. The influx of workers would put a short- to long-term strain on medical and emergencies services either through emergency response to construction-related emergencies and injury or illness of the workforce.

Project shippers are likely to seek to transport the oil using trucking and/or rail while the North Bismarck Reroute is permitted and constructed. The SRST provided input and economic projections to support arguments that transportation via truck and rail would not occur at the maximum capacities equivalent to the Project, and therefore should be analyzed based on lesser volumes. As discussed in Section 1.4, [Introduction and Background] Demand for Oil and Necessity for the Project, the unpredictability of the oil market renders economic projections unreliable. Section 1.2, [Introduction and Background] Purpose and Need, also explains that any alternative under consideration must be capable of meeting the Project purpose, which must be capable of transporting 1,100,000 bpd. Therefore, this EIS analyzes the effects across all resource areas to transport those volumes.

Crude oil output would likely be shut in until the alternative transportation was secured and is anticipated to result in revenue loss for North Dakota's oil producers. In turn, the state would lose tax revenue from oil production. North Dakota has predicted that 427,000 to 513,000 barrels of oil per day will likely remain shut-in until alternate transportation can be secured and prices rebound to make that transportation economically viable. A shift to truck and/or rail transport is anticipated to occur gradually (months to a year), with a need to restart terminals and hire more workers. During the transition, farmers would be competing to transport grain via truck and rail, as the increased need for trucks to transport oil would impact the availability of trucks and truck drivers to transport grain, and there would be competition for transporting oil and grain on the same rail track (Clay et al., 2019). Likewise, roughly half of the crude oil shipped out of North Dakota to refineries in 2019 was done by rail. During the transition away from pipeline transportation, there will be increased competition and cost for rail transport of oil (Clay et al., 2019). The number of trains and trucks that would be used as a substitute for the pipeline would be affected by the availability of those modes of transportation and the cost of those modes of transportation as compared to the pipeline, which would affect the amount of oil transported.

Further, the American Trucking Associations, Inc. released an update in October 2021 that estimated a truck driver shortage would reach over 80,000 drivers in 2021 (ATA, 2021). To combat the shortage, the trucking industry has raised pay significantly. The competition between oil and grain, shortage of drivers, and increased costs for truck transportation could lead to delays, resulting in an adverse economic impact on farmers. Transportation costs for agricultural commodities would also increase due to competition for space in trucks and on railroad cars; this would result in increased food costs for consumers.

The State provided a declaration of Lynn D. Helms, Director of the North Dakota Industrial Commission Department of Mineral Resources to the District Court, which states that the insufficient rail capacity combined with low oil prices from the COVID-19 pandemic would result in oil rig closures and large numbers of temporary and permanent job losses (8,950 and 4,475 to 7,175 full-time jobs, respectively).[42] However, as is discussed in Section 1.4, [Introduction and Background] Demand for Oil and Necessity for

[42] Declaration of Lynn Helms, April 29, 2020, in *Standing Rock Sioux Tribe; Yankton Sioux Tribe; Robert Flying Hawk; Oglala Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al.*, United States District Court for the District of Columbia, Civil No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-01796 and 17-cv-00267).

the Project, past forecasts submitted by experts have been superseded by actual conditions (e.g., the price of oil has rebounded in 2021 to above 2019 pre-pandemic prices [EIA, 2022]).

Additionally, the State, which has permitting authority over pipeline construction in the state, has emphasized that it has previously evaluated the Project and approved the siting in its current location, which was not challenged in court. The State notes the uncertainty regarding whether any reroute would be approved and, correspondingly, whether any beneficial socioeconomic impacts from operating the pipeline at a different location would ever be realized. While this issue does pose a potential conflict, this EIS analyzes the effects of a reroute, assuming one could be permitted as an alternative that is capable of meeting the Project purpose. Overall, the impacts of truck and/or rail transport of oil while the North Bismarck Reroute is permitted and constructed would result in moderate and short-term, adverse impacts on the local and state economies.

In conclusion, assuming a reroute would be permitted, there would be a moderate net adverse impact of construction and operation of Alternative 5 on socioeconomics. Although production and transportation via the alternative route would continue in the long term, crude oil output would likely be shut in until the alternative transportation were secured, resulting in revenue loss for North Dakota's oil producers and the State.

Because the Project has been constructed, implementation of Alternative 5 would require abandonment of the Lake Oahe crossing (under Alternative 1 or Alternative 2). Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and the combined impact determinations presented here are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline.

The impact area from a large release of crude would likely be similar for the North Bismarck Reroute when compared to the current route, see Section 3.1.6.5, [Reliability and Safety, Impacts and Mitigation] Alternative 5, for more information. Therefore, any pipeline oil release that occurs on land would likely be more severe under the North Bismarck Reroute than the current route, as the North Bismarck Reroute is closer to a larger number of sensitive areas and crosses the Missouri River 12 miles upstream of Bismarck and Mandan, meaning a release similar to the WCD scenarios modeled under Alternative 3—under specific conditions—would be able to reach these two urban areas.

In the case of socioeconomics, the combined impact is effectively the overall net impact after accounting for the net adverse economic impacts from abandoning the pipeline by removal or in place as described for Alternatives 1 and 2, and the net adverse economic impacts from Alternative 5. Alternatives 1 and 2 would result in major and long-term to permanent adverse impacts on local and state economies from job and tax revenue loss. Alternative 5 would also produce moderate adverse impacts through reduced transportation capacity and resulting shut-ins. Therefore, the construction and operation impacts on socioeconomics for Alternative 5, in combination with either Alternative 1 or Alternative 2, would be significant adverse impacts.

3.8.2. Environmental Justice

3.8.2.1. Project Background

The 2016 EA evaluated the environmental effects of the USACE's decisions to grant permission under Section 14 of the Rivers and Harbors Act ("Section 408") and to issue an easement under Section 185 of the MLA to Dakota Access, LLC for it to place a portion of its pipeline on USACE-managed federal lands at Lake Oahe in North Dakota (see Chapter 1, Introduction and Background, of this EIS).

After completion of the 2016 EA, multiple Tribes filed lawsuits against the USACE. In 2017, the District Court remanded the environmental justice elements of the 2016 EA back to the USACE for additional analysis of the environmental effects of the decisions on low-income, minority, and tribal populations.

The District Court's criticisms focused on the consideration of the potential effects of the operation of the pipeline at the point it crossed USACE-managed federal lands at Lake Oahe. Specifically, the District Court questioned whether the 0.5-mile-buffer unit of geographic analysis used in the 2016 EA was sufficient to capture the environmental effects on low-income, minority, and tribal populations from a potential crude oil release. The District Court also found that the 2016 EA lacked necessary information regarding cultural, social, and economic factors specific to tribal populations that could amplify the environmental consequences of a potential release. In addition, the District Court specified that the 2016 EA insufficiently described the potential effects of a crude oil release on the water intakes relied on by those populations.

In 2018, the USACE prepared a response to address the District Court's comments, including a characterization of the importance of subsistence hunting and fishing to Tribes and an assessment of the effects of a crude oil release on subsistence resources based on a supplemental modeling study (USACE, 2018). Additionally, the USACE increased the environmental justice review area to a 1-mile buffer of the east and west shorelines of the Missouri River to the CRST's drinking water intake and assessed the threats on the SRST drinking water intake.

The SRST previously completed an environmental justice analysis of the DAPL Project and an alternative route previously considered under the 2016 EA. The SRST stated that the geographic extent of the analysis in the 2016 EA was too limited and therefore could misrepresent the socioeconomic disparities of the tribal populations (Saha and Mohai, 2018). The environmental justice analysis in this EIS addresses the SRST's concern by: 1) expanding the 2016 EA's geographic extent of analysis from a 1-mile buffer of the Missouri River to include reservations that may be directly affected by a crude oil release from DAPL at the Lake Oahe crossing, including the SRST Reservation and the CRST Reservation, and the Lake Oahe crossing, which is located in the treaty areas established in the Fort Laramie Treaties of 1851 and 1868; 2) analyzing the input provided by the SRST, CRST, and Oglala Sioux Tribe through USACE outreach; and 3) further considering the interrelated environmental, socioeconomic, and cultural factors that may amplify the environmental effects of a potential release (described in the release scenarios in Appendix G, Dakota Access Pipeline Optimization Modeling Reports) on the SRST and CRST tribal populations located along Lake Oahe. This is accomplished with sections dedicated to treaty rights and subsistence.

Additionally, the SRST environmental justice report states that the earlier studies of environmental justice for the operating pipeline were compared to a route north of Bismarck. The SRST report concluded that the geographic extent of the analysis was also too limited. Therefore, a new desktop analysis for Alternative 5 is included in Section 3.8.2.6, [Environmental Justice] Impacts and Mitigation.

The Oglala Sioux Tribe is one of the Tribes that is a successor-in-interest to the 1851 Fort Laramie Treaty negotiated between the United States and one of several Indian Tribes currently residing in the Missouri River Basin (see Section 3.8.2.2, [Environmental Justice] Treaty Rights and Subsistence). The Pine Ridge Reservation of the Oglala Sioux Tribe is not situated along the Missouri River; however, the Oglala Sioux Tribe is one of four project sponsors of the Mni Wiconi Rural Water Supply system, which provides potable water drawn from the Missouri River to a vast area, spanning ten counties in central and southwest South Dakota through the Oglala Sioux Rural Water Supply System. It is the largest Native American/Tribal Water System in the United States. The service area includes a 12,500 square mile area, which is 17 percent the total area of South Dakota (OSRWSS, 2019). The nearest Mni Wiconi Project intake is about 200 miles downstream of the Lake Oahe crossing near Pierre, South Dakota (Mni Wiconi Water Treatment Plant/Coreline, 2023). Impacts on water intakes are included in Section 3.3.1.3, [Water Resources, Surface Waters] Impacts and Mitigation.

Missouri River History

Through government-to-government consultation, cooperative agency input, and tribal input during scoping, Tribes have emphasized the importance of the Missouri River Basin and the history of the tribal populations who live there. The Missouri River is characterized by tribal peoples as “The Water of Life,” and the water that created the corridor is considered sacred. While the scope of this EIS is focused on the request of an easement for DAPL to cross Lake Oahe and assumes a baseline condition of the existence of Lake Oahe, a brief history of the impacts from the construction of the Oahe Dam is described below because of its profound impact on the Tribes.

The Missouri River and its associated lowlands and floodplains have been important to Indigenous Peoples since before European settlement in the area. The water, plants, and animals were widely used for subsistence and cultural practices and are essential to the lives of Indigenous Peoples. Inundation of lowlands to create reservoirs along the Missouri River as part of the Pick-Sloan Project seriously impacted Tribes. During the construction of the Mainstem Dams, the United States acquired 1,499,759 total acres, of which 349,566 acres were acquired from tribal lands. Specific to Lake Oahe, 55,994 acres were acquired from Standing Rock Reservation and 99,548 acres from the Cheyenne River Reservation. For the Tribes affected, the loss is significant. These Tribes depended on the valley economically, culturally, and spiritually. Traditional foods, spirituality, healing, and economic growth are losses that continue to be felt in these communities. Places intrinsic to tribal origin stories and events in oral histories have been lost. Despite this loss, the Missouri River ecosystem and its wellbeing continue to be crucial to the spiritual practices and ways of life of the Tribes. Tribes feel a direct relationship between the environmental, spiritual, and cultural realms and their interconnection with the continued survival of their Tribes.

3.8.2.2. Treaty Rights and Subsistence

The following sections provide an introduction to environmental justice, an analysis of the affected area, and impacts and mitigation from the past and future Project activities under the five alternatives on treaty rights and subsistence of environmental justice communities. This section provides a summary of federal guidance on the identification of environmental justice populations, a summary of tribal treaty and water rights, the broad definition of subsistence as used in this EIS, and tribal declarations regarding the cultural and economic importance of the Missouri River and the Lake Oahe crossing. Section 3.8.2.3, [Environmental Justice] Assessing Impacts, provides baseline information used to develop the significance criteria in the analysis of potential Project impacts on treaty rights and subsistence. Section 3.8.2.4, [Environmental Justice] Past Project Impacts and Mitigation, addresses impacts and mitigation from Project construction and the first few years of operation. Section 3.8.2.5, [Environmental Justice] Current Affected Environment, provides information about the current affected environment and how associated impacts and mitigation have been analyzed. Section 3.8.2.6, [Environmental Justice] Impacts and Mitigation, provides an analysis of impacts and mitigation for Alternatives 1 through 5.

Federal Guidance

The United States has a unique legal relationship with Indian tribal governments as set forth in the U.S. Constitution, treaties, statutes, EOs, and court decisions. The federal government has enacted numerous statutes and promulgated numerous regulations that establish and define a trust relationship with tribal nations. The USACE recognizes these trust relationships/responsibilities and will continue to work with Indian Tribes on a government-to-government basis to fulfill all federal responsibilities.

Under the federal trust doctrine, the United States and agencies of the federal government owe a fiduciary duty to Tribes. The nature of that duty is established and governed by statute: United States v. Jicarilla Apache Nation, 564 U.S. 162 (2011). This includes the duty to consider and protect tribal resources impacted by an agency’s action. President Biden issued a memorandum entitled Memorandum on Tribal Consultation and Strengthening Nation-to-Nation Relationships dated January 26, 2021, that prioritizes commitment to fulfilling federal trust and treaty responsibilities to tribal nations, particularly in the face of racial injustice and climate change issues that “disproportionately harm Native Americans” (The White House, 2021).

Environmental justice refers to the “fair treatment and meaningful involvement of all people regardless of race, color, national origin, income, and educational levels” (EPA, 2019a). EO 12898 entitled *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Fed. Reg. 7629) was issued in 1994. Its purpose is to identify environmental and human health effects of federal actions on minority populations, low-income populations, Indian Tribes, and indigenous communities and find ways to provide protections for these communities to the greatest extent practicable and permitted by law.

EO 12898[43] also calls for consideration of populations that rely on subsistence consumption of fish and wildlife for a principal portion of their diet. It provides for agencies to collect, maintain, and analyze information on patterns of subsistence consumption of fish, vegetation, or wildlife. Where an agency action may affect fish, vegetation, wildlife, or subsistence patterns of consumption, the analysis should identify whether subsistence consumption represents the exercise of legal rights based on treaties.

According to the CEQ guidance for implementing EO 12898 under NEPA:

> [a]gencies should consider the composition of the affected area to determine whether minority populations, low-income populations, or Indian tribes are present in the area affected by the Proposed Action, and if so whether there may be disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, or Indian tribes. (CEQ, 1997)

The CEQ regulations define "human health or environmental effects" to include economic, environmental, social, cultural, or health-related impacts whether direct, indirect, or cumulative (40 CFR § 1508.8; CEQ, 1997).

EO 14008 entitled *Tackling the Climate Crisis at Home and Abroad* (86 Fed. Reg. 7619) further emphasized the importance of evaluating environmental justice in agency decision-making and directed agencies to make achieving environmental justice part of their missions. To assist federal agencies to identify disadvantaged or environmental justice communities, the CEQ launched the Climate and Economic Justice Screening Tool (CEJST Version 1.0), a geospatial platform that provides thresholds for eight categories of burden as well as low-income data within census tracts. (CEQ, 2022).

Related to potential social and cultural impacts, EO 13007 entitled *Indian Sacred Sites* (1996), directs federal land managing agencies to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites, provided that the Tribe has informed the agency of the existence of such a site.

Environmental justice issues encompass impacts on the natural environmental and interrelated social, cultural, and economic effects; therefore, this EIS considers the specific historic and cultural context of the environmental justice communities that could be affected by the Project. The SRST stated during a government-to-government consultation meeting on July 9, 2021, that past actions or harms by the USACE (e.g., construction of the main-stem dams on the Missouri River) and the federal government (e.g., removal from traditional homelands, forced assimilation at boarding schools) have impacted tribally important places, resources, and health, and these past harms should be assessed in this EIS. The USACE considers the collective history of tribal communities, recognizes that adversity faced by each generation may differ, and focuses on how those events may be linked to present day conditions (e.g., poverty). In

[43] EO 12898 was amended by EO 14008, *Tackling the Climate Crisis at Home and Abroad*, on January 27, 2021, to create a White House Environmental Justice Advisory Council that would increase the federal government's efforts to address environmental justice, including recommendations for further revisions to EO 12898. On May 21, 2021, the White House Environmental Justice Advisory Council published final recommendations for revising EO 12898, including a 5-year review of how agencies considered impacts on environmental justice communities in the NEPA process and advancing environmental justice through the NEPA review process.

doing so, this analysis recognizes that the past events have contributed to and form the basis for their status today as environmental justice communities. Therefore, the Tribe's status, including past actions or harms by the USACE, are considered part of the baseline conditions as described in Chapter 3, Affected Environment, Impacts, and Mitigation.

Participation in subsistence activities holds importance to Tribes beyond the provision of food. Subsistence practices also have social value, including the education of younger generations about traditional knowledge, language, and spirituality. Because traditional Native American life is interconnected with natural resources, this analysis identifies the environmental justice communities included in this analysis, provides an ethnohistorical summary drawn from tribal input that highlights the cultural and traditional importance of the natural environment, includes a summary of treaty rights that protect tribal land-based existence on reservations and in areas outside of reservation boundaries in perpetuity, and provides an overview of subsistence uses by the SRST and the CRST. This information is necessary for a comprehensive assessment of impacts on these environmental justice communities (SRST and CRST) that are analyzed in this EIS.

Identifying Environmental Justice Communities

According to the EPA environmental justice glossary (EPA, 2019a), a minority is defined as an individual who is a member of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Low-income populations are those that fall within the annual statistical poverty thresholds from the U.S. Department of Commerce Bureau of the Census Poverty Thresholds (EPA, 2019a). For 2021, the annual low-income threshold ranges from $13,788 to $56,325 depending on family size (Creamer et al., 2022).[44]

Demographic information for Tribes in the study area was collected from the U.S. Census Bureau. These data include metrics (e.g., income) that represent social vulnerability characteristics of a disadvantaged population. The U.S. Census Bureau data indicate that the populations residing on reservations near the Project have higher poverty rates and lower incomes than the states where they are located. According to data from the U.S. Census Bureau), 38.2 percent and 41.0 percent of individuals in the CRST and the SRST communities are below poverty level, respectively (U.S. Census Bureau, 2021a, 2021b). In comparison, individuals living below poverty in North Dakota make up 11.1 percent of the state population (U.S. Census Bureau, 2021c) and 12.3 percent in South Dakota (U.S. Census Bureau, 2021d).

In this analysis, the SRST and the CRST are considered environmental justice communities based on a review of U.S. Census Bureau's American Community Survey 5-year estimates and CEQ's CEJST tool. The geographic scope of this analysis for the SRST and CRST includes these Tribe's reservation land. The demographic summary based on census tracts within each Tribe's reservation is provided in Table 3.8.2-1.

[44] The year 2021 represents the most current low-income threshold data published by the U.S. Census Bureau.

Table 3.8.2-1: Environmental Justice Demographic Indicators

Geography	Population for whom Poverty Status is Determined [a, b]	Population at or below the Poverty Level (Count) [a, b]	Population at or below the Poverty Level (%) [a,b]	American Indian and Native Alaska Alone Population (Count) [a, b]	American Indian and Native Alaska Alone Population at or below the Poverty Level (Count) [a, b]	American Indian and Native Alaska Alone Population at or below the Poverty Level (%) [a, b]
North Dakota	749,639	80,390	10.7	37,633	11,671	31.0
Sioux County	3,929	1,514	38.5	3,404	1,447	42.5
Census Tract 9408 [c]	1,477	584	39.5	1,131	562	49.7
Census Tract 9409	2,452	930	37.9	2,273	885	38.9
South Dakota	853,175	106,291	12.5	69,177	33,981	49.1
Corson County	3,943	1,717	43.5	2,800	1,581	56.5
Census Tract 9410	1,724	722	41.9	934	593	63.5
Census Tract 9411	2,219	995	44.8	1,866	988	52.9
Dewey County	5,287	1,858	35.1	4,087	1,776	43.5
Census Tract 9415	2,488	937	37.7	2,247	913	40.6
Census Tract 9417	2,799	921	32.9	1,840	863	46.9
Ziebach County	2,473	1,100	44.5	1,769	899	50.8
Census Tract 9416	2,473	1,100	44.5	1,769	899	50.8

[a] Source: U.S. Census Bureau, 2021e. Hispanic or Latino Origin by Race, Table B03002, 2017-2021 American Community Survey 5-year Estimates.
[b] Source: U.S. Census Bureau, 2021f. Poverty Status in the Past 12 Months, Table S1701, 2017-2021 American Community Survey 5-year Estimates.
[c] Census tracts generally have a population size between 1,200 and 8,000 people, with an optimum size of 4,000 people. A census tract usually covers a contiguous area.

Fort Laramie Treaty and Congressional Acts

The U.S. Constitution defines treaties as the supreme law of the land. Several Tribes commented that the Tribes who historically inhabited the Missouri River Basin did not cede lands to the federal government under these treaties. These land transfers occurred without translators proficient in tribal languages and cultures, making it difficult for tribal signatories to understand the content of the treaties. In light of the trust relationship between the federal government and Tribes and the inequities in treaty making, the government developed the canons of construction to interpret the treaties. In several cases, the courts have made decisions based on the canon that treaties should be "construed liberally in favor of the Indians, with ambiguous provisions interpreted to their benefit" (Skibine, 2021). The treaty rights present in the geographic scope of this analysis that may be affected include the use of natural or environmental resources as described below.

Native American rights to fish and hunt in certain areas are based on treaties that documented tribal land cessations and tribal rights beyond current reservation boundaries. Treaties recognize the unique relationship between the federal government and federally recognized Indian Tribes as sovereign nations. Access to traditional resources (including fisheries, wildlife, and culturally important plants) is a right that the Tribes had traditionally exercised and that they reserved to themselves in treaties. These treaties are binding unless Congress abrogates the treaty rights.

Several Indian Tribes currently residing in the Missouri River Basin, including the Tribes discussed in this EIS, entered into treaties with the federal government at Fort Laramie in 1851 and 1868.[45] The Sioux Territory was first defined in the Fort Laramie Treaty of 1851, 11 Stat. 749. Under that treaty, the territory comprised what is now South Dakota and parts of Nebraska, Wyoming, North Dakota, and Montana the Sioux Tribes also reserved "the privilege of hunting, fishing, or passing over" any of the lands described in the Fort Laramie Treaty of 1851 (Art. 5, 11 Stat. 749) (text quoted from 1851 WL 7655 [Trty.]). The second Fort Laramie Treaty of 1868 (15 Stat. 635) established the Great Sioux Reservation. The reservation covered much of what is now western South Dakota and part of North Dakota. The 1868 Treaty provided the "absolute and undisturbed use and occupation" of the reservation lands to the Sioux Tribes (1868 Treaty, Article II, 15 Stat. 636). The 1868 treaty reserved prior Sioux treaty rights, except provisions regarding the payment of annuities. In 1889, Congress enacted a statute diminishing the Great Sioux Reservation and dividing the remaining territory into six smaller reservations, including the Standing Rock Reservation, the Cheyenne River Reservation, the Pine Ridge Reservation, the Rosebud Reservation, the Lower Brule Reservation, and the Crow Creek Reservation (1889 Sioux Act, 25 Stat. 888, March 2, 1889). The 1889 Act expressly preserved any rights under the 1868 treaty that were "not in conflict" with the Act (1889 Act, § 19, 25 Stat. 896). The 1889 Sioux Act did not specifically address hunting and fishing as being in conflict with the Act. The Fort Laramie Treaties of 1851 and 1868 guaranteed the Sioux the "privilege of hunting, fishing, or passing over any of the tracts of country" ceded to the United States, which include the federal lands at the Lake Oahe crossing. The Treaty of Fort Laramie of 1851 has been superseded by other agreements and legislation that cede any claim to the land.

[45] Scanned copies of the Fort Laramie Treaties and signatories can be found at Kappler, 1927.

The 1944 Flood Control Act did not authorize acquisition of tribal land, but subsequent takings statutes did (Big Bend Act, Pub. L. No. 87-734, 76 Stat. 698 (1962); Fort Randall Dam and Reservoir Act, Pub. L. No. 85-923, 72 Stat. 1773 (1958); Standing Rock Oahe Act, Pub. L. No. 85-915, 72 Stat. 1762 (1958); Cheyenne River Oahe Act, Pub. L. No. 81-776, 68 Stat. 1191 (1954)). These takings statutes that acquired tribal land for the Oahe Dam Project expressly recognized tribal rights to hunt and fish on the shoreline and reservoir, subject to future regulations.

Tribal Water Rights

The SRST stated that tribal water rights should be considered in this EIS. Water plays an important role in sustaining tribal communities. The legal foundation for water rights is known as the reserved rights doctrine established by the Supreme Court in *Winters v. United States* (207 U.S. 564, 28S. Ct. 207, 1908). This foundational case doctrine holds that the U.S. in reserving reservation lands for Tribes also reserved access to water for reservations. Federal Indian reserved water rights entitle Tribes to the amount of water that is necessary to fulfill the purpose of the reservation (Congressional Research Service, 2019). Water rights are considered vested property rights. The water right holders do not own the water itself, but own the right to use the water.[46] When water basins such as the Missouri River are disrupted, Tribes are vulnerable to potential environmental resource loss due to their socioeconomic conditions, particularly for communities that have a high proportion of people practicing subsistence lifeways.

The USACE has further recognized that operation of Lake Oahe needs to be consistent with the Winters doctrine. See *Impact Suffered by the Tribes in the Upper Basin of the Missouri River: Hearing Before the Comm. on Indian Affairs of the United States Senate*, 108th Cong. 53 (2003) (statement of George Dunlop, Deputy Assistant Secretary of the Army on Civil Works). Although Tribes' federal reserved water rights at Lake Oahe have not yet been specifically adjudicated, Congress has authorized the construction of a rural water system to serve the SRST under the Garrison Diversion Unit Reformulation Act of 1986. The impacts on the intakes used by the SRST are discussed in Section 3.3.1.3, [Water Resources, Surface Waters] Impacts and Mitigation, of this EIS.

In 1944, the Pick-Sloan Flood Control Act was passed with the purpose of managing flood control, navigation, energy development, and irrigation through the development of dams and reservoirs throughout the Missouri River Basin. Between 1949 and 1962, Congress enacted seven statutes to carry out the Pick-Sloan Missouri River Project, which authorized takings of land within the six reservations created by the 1889 Act (Bourland, 508 U.S. at 684). Some of the largest of the legislative takings involved the SRST and the CRST lands for the impoundment of the Missouri River to create Lake Oahe. The relevant takings language for the Lake Oahe Project provided that the SRST and the CRST retained "without cost, access to the shoreline of [Lake Oahe], including permission to hunt and fish in and on the aforesaid shoreline."

In 1954, the Bureau of Indian Affairs prepared a report documenting the settlement damages on the reservations affected by the Lake Oahe Project. This report provides limited historic data on subsistence use in the takings areas of the Standing Rock Sioux and the Cheyenne River Sioux reservations in the mid-1950s. The Bureau of Indian Affairs reported that many "Indian families supplement their meager

[46] Final Decree of Water Rights for Turtle Mountain Band of Chippewa Indians, Montana Water Court, July 12, 2021

cash income substantially by hunting and gathering natural products" (BIA, 1954). These products include wood, furbearers, and "[d]eer, cottontails, pheasants, partridges, prairie chickens, and other kinds of upland game provide appreciable quantities of food. Plums, cherries, grapes, June berries, wild turnips, mouse beans, and other natural products are gathered in considerable quantity. These natural products furnish a substantial part of the living needs and thus constitute an essential supplement to the small cash incomes derived from cattle, rentals, and wages" (BIA, 1954).

According to Capossela (2015), approximately 356,000 acres of reservation lands were taken by the Pick-Sloan program. In the 1980s, Tribes whose reservations were on the Missouri River and had been affected by the construction of the Pick-Sloan project dams sought compensation. In 1985, the Department of Interior established the Joint Tribal Advisory Committee to hear just compensation claims by Tribes whose historic homelands were flooded by the dams and review whether the federal government made a good faith effort to compensate Tribes. The Equitable Compensation Act of 1992 (Pub. L. No. 102-575, 108 Stat. 4732) declared that the SRST was entitled to additional financial compensation for flooding of about 56,000 acres of reservation land. Additional federal legislation was passed between 1996 and 2006 to establish tribal recovery trust funds exceeding $385 million in compensation to Tribes for reservation lands lost as part of the dam projects (Church et al., 2015).

Subsistence

As used in this EIS, the term "subsistence" means the traditional uses by minority populations, low-income populations, and Indian Tribes of wild, renewable resources for direct personal or family use as food, medicine, fuel, building materials, art, and spiritual practices. The holistic nature of subsistence encompasses traditional activities that include connection of people to their land and environment, maintenance of a healthy diet throughout the year, support of social and spiritual aspects of life, and transmission of knowledge between generations, all of which are essential to maintaining cultural identity[47] (CRST, 2018). Effects on subsistence resources and associated habitat often result in effects on subsistence users particularly with their harvest success. The Project's potential to affect subsistence resources and users, and therefore, treaty rights, has been a concern explicitly expressed by the SRST, CRST, federal agencies, and others in scoping meetings and letters to the USACE.

Members of the SRST and the CRST expressed concerns that the Project—specifically a crude oil release—would adversely affect subsistence. The primary concern about Project effects included a decrease in the availability of subsistence resources (e.g., wildlife, fish, and vegetation) thereby disrupting the continuation of this socioeconomic and cultural practice granted by treaty and congressional acts. Section 4-4 of EO 12898 calls for consideration of populations that rely on subsistence consumption of fish and wildlife for a principal portion of their diet. Comments offered by subsistence harvesters in the scoping meeting, letters, reports, and declarations provide the data on subsistence uses needed to conduct the impact analysis.

[47] Declaration of Jeff Kelly, November 28, 2016, in *Standing Rock Sioux Tribe. v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case 1:16-cv-01534-JEB, in a letter from SRST to USACE Re: Standing Rock Sioux Tribe – Dakota Access Pipeline, dated December 2, 2016

Because the 2016 EA did not analyze subsistence, this EIS explains how the significance of impacts on subsistence, and therefore, treaty rights, is analyzed.

Ethnohistory

The water, land, and natural resources are critical to the Tribes along the Missouri River. Water is essential to life and is considered to be sacred by several of the Missouri River Tribes, including the SRST and CRST. Both water and land resources are significant elements of cultural identity and are necessary to maintain cultural practices. The importance of the Missouri River to Tribes for subsistence, spiritual, and religious purposes is summarized in the preamble to the Programmatic Agreement (USACE, 2004):

> …Indigenous Peoples have established and maintained cultures and traditions that revolve around the natural resources of, and wildlife attracted by, the Missouri River ecosystem. This ecosystem and its well being continue to be crucial to the worship practices and life ways of contemporary Indigenous Peoples. There is a direct relationship between the environment, traditional worship practices, and the continued survival of diverse indigenous groups. Animals such as the buffalo, eagle, wolf, turtle, migratory and non-migratory birds, a variety of fish and aquatic plants and animals, as well as several species of trees, shrubs, and plants are central to traditional worship beliefs and practices. Within the Missouri River corridor, important natural springs exist which are sacred to Indigenous Peoples and have been considered so for thousands of years.
>
> For Indigenous Nations, Cultural Resources include animals, plants, and natural resources, as well as burial, occupation, prayer/worship, gathering, and gardening sites. Cultural Resources from the perspective of land-based worshippers also include important viewsheds, buttes, mountains, high ridges, and other natural formations.

In addition to comments received during the scoping period, several Tribes provided letters and declarations to the USACE supporting that Lake Oahe is important for many reasons:

- On March 24, 2016, the SRST sent a letter to the USACE and commented that water is the “source of life” and is sacred because it “connects all of nature and sustains existence” (SRST, 2016).
- On September 21, 2021, the SRST sent a letter to USACE stating that the confluence of the Missouri and Cannonball rivers is a “place where generation upon generation my ancestors came for ceremony, trade and commerce” (Eagle, 2021).
- The CRST is connected and dependent [on] “the Missouri River, the Moreau River, and the Cheyenne River.” The Tribe has,

  > …depended on these rivers and their tributaries, the principal water supply for the region, for both subsistence and spiritual resources from the distant past until today. Neither the Tribe's physical nor spiritual existence can be separated from these rivers. The water they provide is a basic element of life. Without

continuation of healthy and adequate water flows in these river systems, life would be difficult if not impossible for the Cheyenne River Sioux Tribe.[48]

- Kip Spotted Eagle, Yankton Sioux Tribal Historic Preservation Officer, states "I have a very young daughter whom, one day, my wife and my mother will take to the Cannonball area of the Missouri River to gather these plants for medicines and for ceremony. This, too, is an invaluable cultural experience and opportunity for passing on knowledge, which is vital to our identity because we are a people of oral history." Medicinal plants found along the Missouri River are also of extreme importance to the Yankton.[49]
- "Many affirm that the rivers continue to provide an essential setting for religious ceremonies, especially for the sweat lodge ceremony. The sweat bath is part of the Rite of Purification. Pure water is poured over hot rocks; the steam purifies those in the lodge so that they may live as Wakan-Tanka wills. Water represents Wakan-Tanka, who is always flowing and giving power and life to everything. A sweat bath is part of the purification ritual before a young person goes out to seek a vision, as is drinking water."[50]
- Water plays an important role in the Sun Dance, in which participants fast and refrain from drinking water for 4 days. It is also important in the sweat lodge ceremony, where it is poured upon heated rocks for purification. It is significant to the Lakota that water is the one thing needed by all living things (SRST, 2018a).

3.8.2.3. Assessing Impacts

Participants in the scoping process offered comments that have been considered in the impact assessment for the environmental justice communities. General concerns about Project effects on environmental justice included the impact of a crude oil release on subsistence resources, water and other sacred resources, human health, and tribal treaty rights; ensuring that tribal knowledge[51] shared by Tribes with the USACE in letters, declarations, and reports, and scientific studies are integrated into the EIS; how Project-related climate change would disproportionately impact low income and minority communities; and that this Project along with other pipeline projects contribute to human trafficking. More detail about these comments is provided in the Scoping Report in Appendix C. Section 3.8.2.6, [Environmental Justice] Impacts and Mitigation, addresses potential impacts on environmental justice communities with a focus on subsistence (wild caught and store bought foods), and treaty and water rights, wildlife and aquatic resources, and drinking water. Health is addressed in Section 3.8.3, cultural resources are

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[48] Declaration of Carlyle Ducheneaux in Support of Cheyenne River Sioux Tribe on Remand to the Corps of Engineers, April 18, 2018, in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB, submitted as part of a letter from the CRST to the USACE dated April 20, 2018

[49] Affidavit of Kip Spotted Eagle, April 19, 2018, submitted as part of a letter from the Yankton Sioux Tribe to the USACE dated April 20, 2018

[50] Declaration of Carlyle Ducheneaux in Support of Cheyenne River Sioux Tribe on Remand to the Corps of Engineers, April 18, 2018, in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB, submitted as part of a letter from the CRST to the USACE dated April 20, 2018

[51] Tribal knowledge includes Traditional Ecological Knowledge, which is defined by the National Park Service as "the on-going accumulation of knowledge, practice and belief about relationships between living beings in a specific ecosystem that is acquired by indigenous people over hundreds or thousands of years through direct contact with the environment, handed down through generations, and used for life-sustaining ways" (NPS, 2020).

addressed in Section 3.7, government-to-government consultation is addressed in Section 1.6, and tribal emergency response planning is addressed in Section 3.1, Reliability and Safety. Based on the analyses presented in this EIS, environmental justice concerns are not present for other resources including climate change, air quality, noise, hazardous waste, recreation, and transportation due to the limited overall Project impact on these resources.

The significance criteria used for assessing impacts on treaty rights and subsistence warrant clarification. As discussed in Chapter 3, Affected Environment, Impacts, and Mitigation, a significant impact is determined on the basis of duration and intensity (see Chapter 3). The significance criteria for Alternatives 3 and 4 are also considered in conjunction with assessing the likelihood of a crude oil release occurring. The following sections summarize the environmental justice impact criteria used in this EIS.

Impact Criteria

The Project does not cross reservation lands but crosses lands on which Tribes exercise their treaty rights to access subsistence resources. To determine if disproportionately high and adverse effects on the environmental justice communities would occur, this section considers unique exposure pathways (e.g., subsistence practices) that could amplify effects and result in adverse outcomes for these communities, and identifies the criteria used to assess potential impacts. From a tribal perspective, any crude oil release would likely affect tribal treaty rights and treaty-protected resources.

Treaty Rights

In assessing potential impacts on treaty rights, the USACE generally followed the EPA's guidelines and considered whether treaties exist within the geographic Project Area, the specific rights provisioned in the treaties (e.g., gathering resources based on hunting and fishing treaty rights), and/or whether treaty-protected resources are used by environmental justice communities within the Project Area (e.g., subsistence resources) (EPA, 2016).

Under the Fort Laramie Treaties, Sioux Tribes reserved the privilege of hunting and fishing within the territory comprising what is now South Dakota and parts of Nebraska, Wyoming, North Dakota, and Montana. The SRST and CRST continue to use treaty-protected resources in the Project Area. Treaty-protected rights to access and use natural resources are an essential part of tribal life and are important to maintain traditional cultural practices, including subsistence. Subsistence encompasses traditional activities that include transmission of knowledge between generations, connection of people to the natural world, and support of social and spiritual aspects of life (Case and Voluck, 2012). Therefore, treaty rights encompass more than the presence or absence of resources harvested for subsistence. The ability of tribal members to continue traditional activities in accordance with cultural norms are integral to exercising treaty rights. The consideration of impacts on treaty rights in this EIS relies on this broader understanding of subsistence to inform the analysis. By definition, impacts on the ability to practice subsistence would constitute an impact on the ability of tribal communities to exercise treaty rights.

Subsistence

In order to assess the potential impacts of the Project on subsistence, subsistence behaviors of tribal community members were characterized based on letters, reports, and declarations provided by the SRST and the CRST. This section also considers publicly available information and the analyses presented in throughout this EIS about physiology, biological needs, and life stage of fish, wildlife, and vegetation to assess the likely behavioral responses of these potential subsistence resources to operations and maintenance impacts.

An adverse impact on subsistence is defined as an impact resulting from the construction and operation of the Project that would likely reduce the availability of one or more subsistence species to a level insufficient for a harvest to meet subsistence needs by causing a species to abandon or avoid subsistence users' harvest areas, would result in a decline in resource abundance through acute mortality, or would decrease community participation in subsistence harvests thereby affecting the practice of cultural norms, including the transmission of traditional knowledge.

The duration of impacts on subsistence could be short-term, long-term, or permanent. Short-term impacts from the Project are defined as those that caused limited or temporary displacement or disruption of resources during construction, with the resource returning to pre-construction condition soon after restoration (months to 1 year). Short-term duration accounts for potential seasonal disruption within an annual cycle. Long-term impacts could result from Project activities that would cause impacts on habitat for the life of the Project or result in a reduction in resource abundance (e.g., during construction and continuing into operation), estimated to continue up to 30 years. Permanent impacts could result from Project activities that cause permanent loss of a resource's habitat, a resource's access to habitat, loss of subsistence user access to all or part of a subsistence use area (e.g., from the construction and operation of facilities), or loss of availability of a resource (e.g., wildlife population decline).

The significance of impacts is based on the duration of the effects and intensity. If the Project would result in a substantial reduction in the opportunity to continue use of subsistence resources, the effect would be considered significant. If the Project would result in a long-term to permanent impact, the effect could also be significant. However, a minor reduction in the opportunity for subsistence uses would not be significant even if it is long-term. The impact criteria are summarized in Table 3.8.2-2.

Table 3.8.2-2: Environmental Justice Impact Criteria: Subsistence and Treaty Rights

Type of Impact	Impact Characteristics	Environmental Justice		
		Major	Moderate	Minor
Changes in subsistence resource availability, abundance, and access	Intensity	Harvest pattern would be affected through multiple harvest cycles. Environmental impact resulting in a complete loss of sense of place and connection, access to, and ability to obtain preferred resources.	Harvest pattern would be affected through one harvest season up to one annual harvest cycle. Impacts would not extend to preferred and/or scarce resources; some loss of habitat or access could occur, but the cultural connection to area would be maintained.	Small change in harvest pattern lasting less than one harvest season. Little to no reduction in the ability to obtain similar quality and quantity of resources. Cultural connection to area would be maintained.
	Duration	Permanent: Changes in use are permanent (extend beyond the life of the Project).	Long-term: Changes in use would occur occasionally (e.g., on a seasonal basis) throughout the life of the Project or would last up to one annual harvest cycle.	Short-term: Changes in use would return to normal levels soon after actions causing impacts cease.
	Likelihood	High likelihood and loss of exercising treaty rights.	Moderate likelihood to impact or diminish the exercise of treaty rights.	No or negligible likelihood to impact on the exercise of treaty rights.
Connection to cultural norms and/or traditional customs	Intensity	Affects resources of cultural importance. Prohibits continuation of customs and transmission of cultural knowledge for more than one generation.	Affects resources of cultural importance. Could affect continuation of customs and transmission of cultural knowledge related to a specific place due to seasonal or locational restrictions. Treaty rights may be interrupted occasionally throughout the life of the Project.	No or negligible effect on resources of cultural importance. Customs and transmission of cultural knowledge would continue. Future generations would connect to traditional lifeways and exercise of treaty rights would continue.
	Duration	Permanent	Long-term	Short-term
	Likelihood	High likelihood to impact intergenerational transmission of knowledge.	Moderate likelihood to impact intergenerational transmission of knowledge.	No or negligible likelihood to impact intergenerational transmission of knowledge.

Crude Oil Release Modeling

In response to the modeling and risk analysis performed for the 2016 EA, the SRST and the CRST critiqued the analysis of the potential for an oil release and also recommended that USACE require additional modeling and address impacts on communities downstream rather than upstream of the Lake Oahe crossing (SRST and CRST, February 14, 2017, Case No 1:16-cv-1534-JEB; SRST, 2018b; Saha and Mohai, 2018). The Tribes also noted that ceremonial uses of water and spiritual values are associated with clean, pure water that are integral to tribal identity and well-being. Because of substantial subsistence uses of Lake Oahe, tribal members are particularly vulnerable to the effects of an oil release and may be disproportionately impacted.

Dakota Access performed additional computational modeling of various WCD release scenarios at the Lake Oahe crossing to evaluate the potential fate and transport of crude oil from a release (see the PHMSA Modeling Report and the FRP Modeling Report in Appendix G).

The PHMSA Modeling Report and the FRP Modeling Report include analysis of the impact of 18 extreme release scenarios at the Lake Oahe crossing, including 12 scenarios representing a FBR unmitigated release and 6 scenarios representing a FBR with mitigation measures deployed promptly. See Section 3.1, Reliability and Safety, the PHMSA Modeling Report and the FRP Modeling Report (Appendix G), for details on the modeled scenarios and results, and Section 3.8.2.6, [Environmental Justice] Impacts and Mitigation, for the impacts on a crude oil release on environmental justice community treaty rights and subsistence. In addition to assessing impacts on subsistence resources, this EIS also assesses the impacts of a crude oil release on drinking water intakes up to 156 miles south of the Lake Oahe pipeline crossing. Three water intakes used by environmental justice communities are: 1) 8.1 miles downstream for SRST's agricultural use; 2) 75.4 miles downstream of the Lake Oahe crossing (south of the Highway 1806 bridge from Wakpala to Mobridge, South Dakota) for human consumption on the SRST Reservation; and 3) approximately 156 miles downstream of the pipeline crossing for the CRST public water intake.

3.8.2.4. Past Project Impacts and Mitigation

The 2016 EA did not identify impacts on minority, tribal, and low-income populations. The Remand Analysis (USACE, 2018) provided information regarding cultural, social, economic, and health factors specific to tribal populations that could amplify the environmental consequences of a potential crude oil release, including the potential effects of a release on the water intakes relied on by those populations. The Remand Analysis (USACE, 2018) expanded the geographic analysis to include the Census Block Groups (CBGs) on both sides of Lake Oahe from 1.5 miles north of the Lake Oahe pipeline crossing south to the CRST's drinking water intake at the southern end of the CRST reservation. From north to south, the analysis area extends from the Lake Oahe crossing to CRST's drinking water intake, which is approximately 156 miles downriver.

The USACE requested additional information from Dakota Access, including an analysis of the impact of various release scenarios at the Lake Oahe pipeline crossing. Based on the remote to very unlikely risk of a release reaching the waters of Lake Oahe, the USACE concluded that adverse environmental and health effects on minority, tribal, or low-income populations would not be significant.

The 2016 EA and Remand Analysis (USACE, 2018) did not address subsistence impacts from construction of the Project. Project construction may have had a temporary and short-term impact on subsistence resources due to noise, lighting, and general human presence. Section 3.4, Vegetation and Noxious Weeds, and Section 3.5, Wildlife and Aquatic Resources, provide background information on habitat impacts as a result of the construction of the Project. However, these impacts were not significant. Project operation to date has not resulted in any crude oil releases or other impacts that would affect subsistence.

3.8.2.5. Current Affected Environment

Subsistence

The characterization of the affected environment examines the subsistence patterns of the potentially affected communities (4 miles north of the Project and 65 miles south of the Project), including the SRST and the CRST. Within a subsistence use area, harvest activities follow a seasonal cycle. The harvest activities are characterized by highs and lows for different resources throughout the year. The timing of these activities are influenced by a number of factors, including wildlife and vegetation availability, climate, and weather conditions. Baseline indicators that are useful to characterize subsistence harvest include:

- Subsistence use area (geographic extent of harvests)
- Harvest amount (harvest by species represented as pounds of edible/usable resource)
- Harvest timing (season of harvest)
- Harvest participation (percentage of households or individuals attempting to harvest)
- Harvest success (households or individuals with successful harvests)
- Harvest sharing (percentage of household that give and receive subsistence resources)
- Harvest diversity (number of different resources harvested)
- Resource status and change (traditional knowledge about resource use, abundance, and distribution and migration of resources)

No comprehensive quantitative harvest data for the indicators listed above is available for tracking past and current subsistence use. Therefore, characterization of the subsistence resources affected environment includes data provided in letters, declarations, and reports by each affected community and through desktop research. This analysis assumes that wild-caught subsistence resources are important components of diets both in terms of nutrition and cultural continuity, and that federal land included in the affected environment is used for subsistence harvests.

Standing Rock Sioux Tribe

The SRST Reservation is located in North and South Dakota. The reservation has a land area of 3,568.4 mi^2 (2,320,275 acres including state, federal, and non-Indian lands within the reservation boundary). Enrolled membership is about 16,102 (with a population of 7,974 on the Reservation) (U.S. Census Bureau, 2021a). The Reservation encompasses all of Sioux County in North Dakota, all of

Corson County, and small portions of Dewey and Ziebach counties in South Dakota. The middle of the main channel of the Missouri River is the eastern boundary of the Reservation.

The SRST Reservation has a high unemployment rate and a need for access to healthy foods (SRST, Comprehensive Development Strategy, 201). A review of the U.S. Department of Agriculture (USDA) Food Environment Atlas and Food Access Research Atlas (ERS, 2020, 2021, 2022) depicts the reservation as low income census tracts in which a substantial number of individuals are more than 20 miles from the nearest grocery store (not including convenience stores). Table 3.8.2-3 lists the number of grocery stores for Sioux County in North Dakota and Corson, Dewey, and Ziebach counties in South Dakota reported in 2016. Wild harvested foods are an important supplemental source of food and nutrition where employment is low and poverty is high. The Tribe's Department of Game, Fish and Wildlife Conservation issues subsistence permits outside of normal hunting seasons, as necessary, and fish and wildlife resources of the reservation are managed primarily for subsistence use by tribal members.[52]

The SRST regulates fishing on Lake Oahe. The SRST sets daily and possession limits for a number of fish species including walleye (*Sander vitreus*), sauger (*Sander canadensis*), northern pike, largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), white bass (*Morone chrysops*), crappie (*Pomoxis* spp.), bluegill (*Lepomis macrochirus*) and other sunfish (combined), yellow perch (*Perca flavescens*), muskellunge (*Esox masquinong*y) and hybrids, and rainbow smelt (*Osmerus mordax*) (Standing Rock Game and Fish, n.d.). The Tribe does not set limits for catfish or bullheads (family *Ictaluridae*), burbot (*Lota lota*), or non-game species. The Tribe does not allow harvesting of sturgeon (*Scaphirhynchus* spp.) and paddlefish (*Polyodon spathula*) because they are protected species. In addition, the Tribe sets minimum size limits for walleye, sauger, northern pike, and muskellunge.

Table 3.8.2-3: Grocery Stores by County

County, State	Number of Grocery Stores
Sioux County, North Dakota	1
Corson County, South Dakota	1
Dewey County, South Dakota	1
Ziebach County, South Dakota	0

Source: ERS, 2020 and 2021

The SRST completed a habitat inventory to characterize shoreline habitats and subsistence resources that could be negatively affected by a crude oil release in Lake Oahe (SRST Game and Fish Department, 2017). The report presenting the results included a desktop review of state and federal databases to identify fish and wildlife in the area and a field assessment. The field assessment occurred along 10 miles of the river between the Prairie Knights Marina boat ramp and the Fort Yates boat ramp. The field assessment documented 80 vegetation species in submergent, emergent, shoreline fringe, riparian, and

[52] Declaration of Jeff Kelly, November 28, 2016, in *Standing Rock Sioux Tribe. v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case 1:16-cv-01534-JEB, in a letter from SRST to USACE Re: Standing Rock Sioux Tribe – Dakota Access Pipeline, dated December 2, 2016

upland draw areas, 24 fish species, 41 bird species, and numerous terrestrial mammal species that use Lake Oahe, the shoreline of Lake Oahe, and adjacent upland.

Numerous mammal species harvested by the SRST are resident or seasonal visitors to the Lake Oahe area, but most are not dependent on the aquatic environment. Larger species include pronghorn (*Antilocapra americana*), white-tailed deer (*Odocoileus virginianus*), mule deer (*Odocoileus hemionus*), and mountain lions (*puma concolor*). Adjacent to and on the Standing Rock Reservation, mule deer, white-tailed deer, and pronghorn are the most common big game animals. Smaller species in the area include coyote (*Canis latrans*), badger (*Taxidea taxus*), red fox (*Vulpes vulpes*), raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), fisher (*Martes pennant*), mink (*Neovison vison*), and long-tailed weasel (*Mustela frenata*). Beaver (*Castor canadensis*) and muskrat (*Ondatra zibethicus*) are common semi-aquatic mammals hunted for their fur.

Based on data provided by the SRST in the form of letters, declarations, and reports as well as the Department of Game, Fish and Wildlife Conservation's list of wildlife requiring hunting and fishing permits, a list of commonly used subsistence resources is provided in Table 3.8.2-4. This list is not comprehensive because it does not include subsistence resources for which permits are not needed or have not been provided by the Tribe (e.g., berries).

Table 3.8.2-4: Subsistence Resources for Standing Rock Sioux Tribe

Resource [a]	Scientific Name
Big Game	
Mule deer	*Odocoileus hemionus*
Pronghorn antelope	*Antilocapra americana*
White-tailed deer	*Odocoileus virginianus*
Furbearer	
Beaver	*Castor canadensis*
Bobcat	*lynx rufus*
Coyote	*Canis latrans*
Mink	*Mustela vison*
Mountain lion	*Puma concolor*
Muskrat	*Ondatra zibethicus*
Raccoon	*Procyon lotor*
Red fox	*Vulpes*
Small Game	
Eastern cottontail rabbit	*Sylvilagus floridanus*
Squirrel	*Sciurus spp.*
White-tailed jackrabbit	*Lepus townsendii*
Fish	
Bluegill/Sunfish	*Lepomis macrochirus*
Bullhead	*Ameiurus natalis*
Burbot	*Lota*
Channel catfish	*Ictafurus punclatus*
Crappie	*Pomoxis annularis*

Resource [a]	Scientific Name
Largemouth bass	*Micropterus salmoides*
Muskellunge/Tiger cross (Tiger muskellunge))	*Esox masquinongy X Esox lucius*
Northern pike	*Esox fucius*
Smallmouth bass	*Micropterus dolomieu*
Smelt	*Osmerus*
White bass	*Morone chrysops*
Walleye/Sauger/Saugeye	*Sander vitreus*
Yellow perch	*Perea jlavescens*
Waterfowl	
Canada goose	*Branta canadensis*
Canvasback	*Aythya valisineria*
Coot	*Fulica Americana*
Light geese	*Anser spp.*
Mallard	*Anas platyrhynchos*
Merganser	*Mergus spp.*
Pintail	*Anus spp.*
Redhead	*Aythya Americana*
Scaup	*Aythya spp.*
Wood duck	*Aix sponsa*
Upland Bird	
Dove	*Zenaida macroura and Streptopelia decaocto*
Grouse	*Tympanuchus spp.*
Partridge	*Perdix perdix*
Pheasant	*Phasianus colchicus*
Turkey	*Meleagris gallopavo*
Fruit and Berries	
Chokecherry	*Prunus virginiana*
Plum	*Orunus sp.*
Vegetation	
Bergamot	*Monarda fistulosa*
Big sagebrush	*Artemisia tridentata Nutt. ssp. wyomingensis*
Blue grama	*Bouteloua gracilis*
Boxelder	*Acer negundo*
Buffaloberry	*Shepherdia argentea*
Chokecherry	*Prunus virginiana*
Green ash	*Fraxinus pennsylvanica*
Green needlegrass	*Nassella viridula*
Greasewood	*Sarcobatus vermicu!atus*
Hawthorn	*Crataegus spp.*
Junegrass	*Koe!eria macrantha*
Little bluestem	*Schizachyrium scoparium*
Mountain mahogany	*Cercocarpus montanus*

Resource [a]	Scientific Name
Needleandthread	*Hesperostipa comata*
Plains cottonwood	*Populus de!toides*
Red willow	*Cornus*
Rubber rabbitbrush	*Ericameria nauseosa*
Sandbar willow	*Salix interior*
Sandberg bluegrass	*Poa secunda*
Sand sagebrush	*Artemisiafilifolia)*
Silver sagebrush	*Artemisia cana*
Skunkbush sumac	*Rhus trilobata*
Sweetgrass	*Hierochloe odorata*
Western wheatgrass	*Pascopyrum smithii*
Wild Verbena	*Glandularia sp.*
Yucca	*Yucca glauca*

Source: SRST Game and Fish Department, 2021

Cheyenne River Sioux Tribe

The CRST Reservation includes 4,259 mi^2 of land (1,450,644 acres) in Dewey and Ziebach counties, South Dakota. Enrolled membership is 15,993 with a population of 7,806 on the Reservation (U.S. Census Bureau, 2021b). The middle of the main channel of the Missouri River is the eastern boundary of the Reservation and the Cheyenne River forms its southern boundary.

About 38.3 percent of the residents were below poverty level in 2021 (U.S. Census Bureau, 2021b); however, the CRST stated that 96 percent of tribal member are below poverty level[53] (CRST, 2018). A review of the USDA Food Environment Atlas and Food Access Research Atlas (ERS, 2020 and 2021) depicts the Reservation as low income census tracts in which a substantial number of individuals are more than 20 miles from the nearest grocery store. See Table 3.8.2-3 for the number of grocery stores by county.

In a letter dated April 4, 2018, the CRST commented that tribal members are dependent upon the riparian habitats of Lake Oahe for subsistence uses because of the severe poverty on the Reservation. Many species of fish are consumed out of economic necessity. Additionally, fish are used in traditional ceremonies. Lake Oahe is where most tribal members fish (CRST, 2018). Popular fishing locations for tribal members include “waters near Blackfoot, South Dakota, in Bender Bay, around the confluence of Moreau River and Lake Oahe, and around the confluence of the Cheyenne River and Lake Oahe.”

[53] Declaration of Carlyle Ducheneaux in Support of Cheyenne River Sioux Tribe on Remand to the Corps of Engineers, April 18, 2018, in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB

Subsistence deer hunting is also important to the Tribe and provides an "important part of the diet for many Tribal members."[54] One estimate, relying on anecdotal information, was that over 75 percent of tribal members include deer meat as part of their diet.

Between 1998 and 2005, the CRST completed an ethnographic study to document the Tribe's use of riparian habitats (CRST, 2018). Based on data provided by the Tribe in the ethnographic report, letters, and declarations as well as the wildlife species requiring tribal hunting and fishing permits, a list of commonly used subsistence resources is provided in Table 3.8.2-5. This table is not a comprehensive list of subsistence resources, but demonstrates the CRST's use of riparian habitats.

Table 3.8.2-5: Subsistence Resources for Cheyenne River Sioux Tribe

Resource	Scientific Name
Big Game	
Mule deer	*Odocoileus hemionus*
Pronghorn antelope	*Antilocapra americana*
White-tailed deer	*Odocoileus virginianus*
Furbearer	
Badger	*Taxidea taxus*
Beaver	*Castor canadensis*
Coyote	*Canis latrans*
Muskrat	*Ondatra zibethicus*
Porcupine	*Erethizon dorsatum*
Raccoon	*Procyon lotor*
Red fox	*Vulpes*
Skunk	*Mephitis*
Weasels	*Neogale frenata*
Other game	
Bobcat	*Lynx rufus*
Small Game	
Eastern cottontail rabbit	*Sylvilagus floridanus*
Prairie dog	*Cynomys ludovicianus*
Fish	
Bluegill/Sunfish	*Lepomis macrochirus*
Bullhead	*Ameiurus nebulosus*
Burbot	*Lota*
Channel catfish	*Jctafurus punclatus*
Chinook salmon	*Oncorhynchus tshawytscha*
Crappie - black	*Pomoxis nigromaculatus*
Crappie - white	*Pomoxis annularis*
Flathead catfish	*Pylodictis olivaris*

[54] Declaration of Chalmer Combellick [Wildlife Biologist, CRST Game, Fish, and Parks Department] in Support of Cheyenne River Sioux Tribe on Remand to the Corps of Engineers, April 20, 2018, in *Standing Rock Sioux Tribe v. U.S. Army Corps of Engineers*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB

Resource	Scientific Name
Freshwater drum	*Aplodinotus grunniens*
Green sunfish	*Lepomis cyanellus*
Largemouth bass [a]	*Micropterus salmoides*
Northern pike [a]	*Esox fucius*
Rainbow trout	*Oncorhynchus mykiss*
River carpsucker	*Carpiodes carpio*
Shorthead redhorse	*Moxostoma macrolepidotum*
Shortnose gar	*Lepisosteus platostomus*
Shovelnose sturgeon	*Scaphirhynchus platorynchus*
Skipjack herring	*Alosa chrysochloris*
Smallmouth bass [a]	*Micropterus dolomieu*
Smallmouth buffalo	*Ictiobus bubalus*
Smelt	family, *Osmeridae*
Suckers – blue	*Cycleptus elongatus*
Suckers - white	*Catostomus commersonii*
Sunfish	family, *Centrarchidae*
Walleye/Sauger/Saugeye [a]	*Sander vitreus*
Walleye [a]	*Sander vitreus*
White Bass [a]	*Morone chrysops*
Yellow perch	*Perea jlavescens*
Upland Bird	
Gray Partridge	*Perdix perdix*
Mourning Dove	*Zenaida macroura*
Ring-neck pheasant	*Phasianus colchicus*
Sharp-tailed Grouse	*Tympanuchus phasianellus*
Turkey	*Meleagris gallopavo*
Shellfish	
Mussel	Family, *Unionidae*
Vegetation [b]	
Arrowhead	*Sagittaria latifolia*
Bull berry	*Shepherdia argentea*
Chokecherry	*Prunus virginiana*
Currant	*Ribes* spp.
Gooseberry	*Ribes Grossularia*
Ground bean	*Amphicarpaea bracteata*
Red plum	*Prunus americana*
Rosebud	[scientific name unknown, assumed to be *Rosa* spp.]
Serviceberry	*Amelanchier alnifolia*
Sour grape	*Vitis riparia*
Wild carrot	*Daucus carota*
Wild turnip	*Psoralea esculenta*
Yampa	*Perideridia americana*

Sources: CRST Game, Fish & Parks, n.d.; CRST, 2018

[a] Most popular fish species harvested
[b] The list of vegetation includes historic use; some of these plants may no longer be available.

3.8.2.6. Impacts and Mitigation

Project-related impacts on environmental justice populations' treaty rights and subsistence are characterized as short-term, long-term, and permanent. Impacts would vary based on the alternative being evaluated and the alternative's scope, location, duration, and intensity. Impacts on environmental justice populations would be similar to those experienced by the general community; however, low-income or minority populations could experience disproportionate impacts. Environmental justice communities have historically been burdened by a variety of energy projects resulting in impacts because these communities often lack resources, opportunity, and power to influence decisions that affect the environment and their communities (Jonasson et al., 2019). Impacts have the potential to be disproportionately high and adverse on tribal communities who live, work, and use the lands for subsistence, continuing cultural practices, and/or recreation in or near the Project Area. The intensity of impacts may be greater on tribal communities because of their cultural and spiritual connection to the natural environment. Mitigation measures have been developed to minimize and reduce impacts on tribal communities.

Alternative 1

Alternative 1 would require extensive earthwork to remove the existing pipeline by excavation that may include dredging. Dakota Access determined it would need to divert lake flow and excavate about 77 acres of the lake bed in two phases to remove the pipeline, resulting in a total of about 12.3 million cubic yards of excavated material. Dakota Access would require about 1,400 acres of onshore workspace for the spoil storage. Dakota Access estimates that construction to remove the pipeline would occur over multiple seasons and could take 6 to 20 years or more of construction with several seasons for restoration. The nearby Northern Border natural gas pipelines would also need to be removed and rerouted, resulting in additional disturbance to the lake bottom and terrestrial habitat. Northern Border activities would be authorized by FERC and are not addressed here.

The disturbance of terrestrial and aquatic habitat resulting from the excavation of the pipeline and spoil storage is described in detail in Section 3.5, Wildlife and Aquatic Resources. Terrestrial species would be displaced from the spoil storage area to nearby suitable habitat. However, injury or mortality of burrowing animals is possible. Waterfowl would also be displaced to nearby habitat during dredging or excavation in Lake Oahe. Because existing habitats would be restored and impacts would not likely result in mortality or permanent reduced productivity of terrestrial and waterfowl species, impacts on the species would not be significant.

Dakota Access would construct cofferdams to allow water flow on one side of Lake Oahe during excavation or dredging on the opposite side. These activities would result in long-term impacts on aquatic habitat as a result of the mixing of benthic sediments, increased turbidity, resuspension of contaminants in the water column, and increased sedimentation. The changes in water quality and habitat could have indirect effects of stress, decreased reproductive success, or mortality of aquatic species. Direct effects on aquatic species could include injury or mortality during dredging or excavation and damming. Given the short- to long-term effects on aquatic resources and the potential for mortality of aquatic organisms at the crossing location and downstream, impacts would be major and significant.

The impact on a subsistence user to harvest displaced species is dependent upon the cultural values that tie a subsistence user to a specific harvest area, the cost and time available to support harvest trips, and ease of access to the harvest location. In the case of a decreased abundance of species due to mortality or productivity, harvester success may be diminished. The impact of reduced harvest success is dependent on the availability of other subsistence resources. The potential changes to harvest location and harvest abundance over multiple harvest seasons represent a long-term impact of moderate intensity.

Under Alternative 1, the pipeline would no longer be operational and the Project Area would be restored to pre-construction conditions; therefore, no impacts on subsistence and associated tribal treaty rights would occur from operation of the Project.

In conclusion, as a result of the potential effects identified above, construction activities associated with Alternative 1 could result in significant impacts on subsistence and associated tribal treaty rights, and on environmental justice communities representing a high and adverse and disproportionate impact on these communities.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Minor ground disturbing construction activities within the previous HDD workspaces to purge, cut, cap, and abandon the pipeline in place may impact subsistence resources in the Project Area since these resources may be temporarily inaccessible or may temporarily disperse from the construction area (with the exception of non-mobile species such as mussels) due to human presence, lighting, and noise. Species and access would return to prior conditions after construction is completed. Impacts would be temporary and minor.

The pipeline would no longer be operational under Alternative 2; therefore, there would be no potential for a crude oil release, and subsistence and treaty rights would not be affected.

In conclusion, given the temporary and minor impacts discussed above, Alternative 1 would not result in significant impacts on subsistence and associated tribal treaty rights, or on environmental justice communities. High and adverse disproportionate impacts on environmental justice communities are not anticipated.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternative 3

There would be no new construction activity associated with Alternative 3; therefore, there would be no construction impacts on subsistence, water, and treaty rights.

Operation of the Project under Alternative 3 includes the risk of a crude oil release. The USACE considered the likelihood of the occurrence of a crude oil release during operation and potential magnitude of a release, the fate and transport of an inadvertent release of crude oil into Lake Oahe, the potential impacts on hunting and fishing resources in and adjacent to Lake Oahe, and their duration based on modeling of WCD release scenarios as presented in Section 3.1, Reliability and Safety (see also the PHMSA Modeling Report and FRP Modeling Report in Appendix G). The modeling considered 18 conservative or worst-case scenarios and included low water flow, high winds, and ice cover conditions for mitigated and unmitigated releases. Additionally, the USACE assessed unmodeled release scenarios in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Unmodeled Release Scenarios, including a slow or rapid release of crude oil beneath Lake Oahe that would follow the HDD profile, and a slow release at the ND-380 valve site.

As described in Section 3.1, Reliability and Safety, a WCD crude oil release could occur at the Lake Oahe crossing, but such a release is remote to very unlikely and would be minimized by implementation of Dakota Access's response plan. Several types of subsistence resources could be affected by a crude oil release; however, the duration and intensity of the effects would vary. A WCD crude oil release during operation of the Project would result in temporary to short-term impacts of minor intensity on vegetation, including vegetation used for traditional purposes, wildlife, and fish used for subsistence. The modeling quantifies impacts on terrestrial and aquatic species in one value, EA-100, to assess acute mortality based on oil compound concentrations, duration, and exposure for specific types of receptors. The modeling does not consider mobility of species nor species sensitivity to hydrocarbons. The farthest distance for effects on terrestrial species is less than 0.04 mi^2 during mitigated and unmitigated ice-free conditions. The farthest distance for effects on aquatic biota is less than 0.04 to 2.4 mi^2 during both ice-free and ice-covered conditions. For vegetation, shoreline length oiled at a thickness of more than 100 µm is the threshold rather than an EA-100 value.

Once at the surface of the water, oil could adhere to shoreline vegetation, waterfowl, reptiles, and semi-aquatic and aquatic mammals. Oil entrained in the water column and adhered to sediments could be ingested by fish and fish prey and cause mortality and reduced productivity through acute and chronic toxicity. The loss of access to these subsistence resources may necessitate some harvesters dependent on these resources to seek other locations to hunt, fish, and gather until remediation is complete. Because wild foods often supplement cash incomes, the loss could be substantial depending on the timing/season and duration and concentration of the release and remediation.

As discussed in Section 3.5, Wildlife and Aquatic Resources, impacts from a surface release under mitigated and unmitigated scenarios could include the oiling of semi-aquatic and aquatic species, waterbirds and waterfowl, shoreline vegetation, and the associated acute and chronic health effects from inhalation or ingestion of released hydrocarbons by terrestrial species that rely on shoreline habitats.

A surface release under the mitigated and unmitigated scenarios would have negative direct, short- to long-term effects on subsistence resources including fish, migratory birds, plants, and semi-aquatic and terrestrial wildlife (see Section 3.5, Wildlife and Aquatic Resources). These effects, representing a minor to moderate impact on wildlife, could result in the diminishment of tribal members' ability to continue to exercise their treaty rights to practice subsistence harvesting. However, the likelihood for occurrence is remote to very unlikely, and the resulting risk of a crude oil release is negligible to moderate and not significant.

An unmodeled discharge scenario that could result in a rapid, large volume release within the former HDD site or valve site, or a large release along the pipeline where the burial depth is shallow could occur, resulting in oil flowing downslope on the surface or in-water via the Cannonball River impacting shoreline vegetation before flowing into Lake Oahe. These scenarios could result in minor to moderate impacts on vegetation used for subsistence depending on the location, volume, and extent of the release; however, a large area of vegetation is not anticipated to be affected due to safeguards such as monitoring and leak detection. The duration of the impact on vegetation would range from short- to long-term depending on the restoration timeframe.

In the event of the unmodeled scenarios of a small leak in the pipe underneath Lake Oahe, oil would either travel along the pipe and emerge at a more shallow location along the shoreline (similar to a release at the valve site resulting in impacts along the shoreline) or seep up through the sediments into the lake. In the latter case, a small, slow leak would seep upward through approximately 95 to 126 feet of sediment. Much of the oil would likely be retained in the sediment rather than reaching the lake. The contamination would be localized and mostly be limited to potential chronic toxicity of benthic organisms (see Section 3.5, Wildlife and Aquatic Resources). Bioaccumulation in subsistence species that rely on benthic organisms for food could occur. Remediation through removal of the contaminated sediments could release oil into the water column expanding the affected area. Because the various oil constituents would degrade, vaporize, and/or become diluted over time, and the contaminated area would be localized, subsistence impacts would minor to moderate depending on the duration of the remediation.

As is discussed in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Unmodeled Release Scenarios, the unmodeled scenarios would have a remote to unlikely likelihood of occurrence, and a resulting risk ranking ranging from negligible to moderate and could result in minor to moderate impacts on subsistence and treaty rights.

The PHMSA Modeling Report and FRP Modeling Report (Appendix G) include additional modeling analysis to identify impacts on drinking water intakes upstream and downstream of the crossing location. This analysis predicts that no dissolved hydrocarbon concentrations are predicted at water depths greater than 32.4 feet or beyond 65 miles of the release location within the 10-day modeling period. The SRST water intake is about 75 miles downstream of the crossing location and the intake is located at depths of 60 to 80 feet. The modeling predicts that there would be no dissolved hydrocarbons present at this depth or distance and the SRST drinking water intake would likely be unaffected (see Section 3.3, Water Resources, for a discussion of surface water intakes). Although the modeling results indicate that the SRST drinking water intake would not be affected, SRST agricultural intakes may be affected by a WCD. As discussed in Section 3.3, Water Resources, affected agricultural intakes may need to be shut down while remediation activities occur. However, the likelihood of a WCD occurring is remote to very unlikely; therefore, the resulting risk of a crude oil release is negligible to moderate.

The pipeline would be operated and maintained as described in the 2016 EA. Dakota Access would implement monitoring plans, routine inspections, and maintenance in compliance with state and federal permitting requirements to ensure the safe operation of the pipeline (see Section 2.6.1, [Alternatives] Alternative 3: Grant Requested Easement Consistent with Vacated Easement Conditions). In conclusion, construction and operation impacts (including the risk of a crude oil release) on treaty subsistence use and associated treaty rights of environmental justice communities would be minor and not significant. Therefore, high and adverse disproportionate impacts on these communities are not anticipated.

Alternative 4

Alternative 4 requires no new construction, and therefore no impacts on subsistence and treaty rights would occur.

Operational impacts would be similar to Alternative 3. However, the USACE recommends additional measures to be implemented by Dakota Access for Alternative 4, along with those listed in Chapter 2, Alternatives; Section 3.3.1, [Water Resources] Surface Waters; and Section 3.5.2, [Wildlife and Aquatic Resources] Aquatic Resources. Since it began operating nearly 6 years ago, there have been no releases at the Lake Oahe crossing or anywhere else along the nearly 1,200-mile mainline. Although the potential for a WCD crude oil release is considered remote to very unlikely, the following measures, which would become requirements when added as conditions to the easement, would further reduce the possibility of impacts in the event of a release, including minimizing impacts on tribal lands.

- Dakota Access shall implement improved leak detection systems for the Lake Oahe crossing as new technology becomes available and implement frequent drills and simulations for emergency response and preparedness with potentially affected communities in the event of a release incident. Dakota Access shall evaluate and implement new leak detection technology based on a review of industry-wide commercially available and economically feasible technology every 5 years. The technologies shall have a proven record of success for an equivalent application before being required.
- Dakota Access shall develop and implements a plan for food distribution to environmental justice communities that rely on traditional subsistence resources in the event of a crude oil release from DAPL at the Lake Oahe crossing that affects the availability of wild caught subsistence resources to minimize potential community hunger.
- Within 6 months of easement issuance, Dakota Access shall facilitate a separate meeting(s) (offering several date and time options) with the SRST and the CRST to discuss each Tribe’s interest in undertaking systematic subsistence studies. More than one meeting with each Tribe may be needed to discuss the potential for a community-based participatory study. The purpose of the studies would be to develop a baseline of subsistence use (e.g., season of use, species harvested, number of households using each species harvested) on the federal lands and waters at the Lake Oahe crossing. Dakota Access shall document efforts to coordinate each meeting and provide a summary of meetings held. If the Tribes do not wish to participate in a meeting and/or systematic subsistence studies, Dakota Access will have no further requirements. If the Tribes are interested in undertaking subsistence studies on the federal lands and waters, a study plan shall be developed and implemented. The plan and reports of the subsistence study results will be shared with the USACE.

Other additional easement conditions discussed in this EIS include Dakota Access: 1) develop a plan for providing an alternative source of clean drinking water (not as a substitute for ritual purposes) should a crude oil release occur and reach water intakes (see Section 3.3.1.3, [Water Resources, Surface Waters] Impacts and Mitigation), and 2) conduct biannual surveys and sampling at the Lake Oahe crossing to monitor for the presence of petroleum-based hydrocarbons, as well as develop a plan for testing for carcinogenic DHCs in fish in the event of a crude oil release (see Section 3.5.2, [Wildlife and Aquatic Resources] Aquatic Resources). These additional measures would reduce the response time should a release occur and would minimize the impacts of a release.

In conclusion, impacts on treaty rights and subsistence from operation of Alternative 4 are expected to be less than Alternative 3; therefore, high and adverse disproportionate impacts on environmental justice communities are not anticipated with the implementation of the additional easement conditions.

Alternative 5

The North Bismarck Reroute would cross primarily private agricultural and pasture lands along the 111-mile route. No federal lands or reservoirs would be crossed by Alternative 5. Overall, access for subsistence harvesting on private lands would be limited to locations where permission from a landowner or leasee is granted (North Dakota Century Code, Title 20.1). However, subsistence use on the Missouri River and Lake Oahe, located about 15 miles south of the alternative crossing location, would not be subject to the same laws and subsistence harvesting could occur under the appropriate hunting and fishing licenses.

Operation of a pipeline along Alternative 5 would include the potential for an inadvertent release of crude oil into aquatic habitat, including in the Missouri River about 15 miles upstream from the north end of Lake Oahe. The resulting indirect impacts on aquatic habitat from a release would be minor to major given the potential for contamination, as discussed above for Alternative 3. The likelihood of a WCD release is dependent on burial depth and overlying soils information but is estimated to be remote to very unlikely. However, a decline in aquatic species is not anticipated (see Section 3.5, Wildlife and Aquatic Resources). The impact on subsistence use by the SRST and the CRST, communities living downstream from a potential release, and associated treaty rights would be minor.

As a cooperating agency, the State provided input that environmental justice communities are present near Alternative 5 and could be impacted by its construction and operation. The following desktop analysis was completed using EPA guidance to determine presence of minority and low-income populations and assess whether high and adverse environmental impacts fall disproportionately on minority or low-income communities identified along the North Bismarck Reroute.

Table 3.8.2-6 provides the results of a desktop review of demographic and income data based on the EPA's Environmental Justice Mapping and Screening Tool (EJSCREEN; EPA, 2022) for the 10 CBGs crossed by Alternative 5. The purpose of this desktop review is to determine if minority and low-income populations are present in the vicinity of Alternative 5. The 10 CBGs represent the desktop analysis area.

Individuals who identify as any race other than white and/or list their ethnicity as Hispanic or Latino are considered minority (EPA, 2021). According to federal guidelines, an area where the minority population exceeds 50 percent of the total population or where the minority population percentage is "meaningfully greater" than the minority population of an appropriate unit of geographic analysis (e.g., 10 percent greater than the county population), referred to as a reference population, is determined to be an environmental justice population (CEQ, 1997).

There is no quantitative definition of what proportion of low-income populations constitutes an environmental justice population. Guidelines suggest using an appropriate poverty threshold and comparing the low-income population in an affected area to a reference population (Federal Interagency Working Group on Environmental Justice and NEPA Committee, 2016). Low-income is defined by the EPA as households where the income is less than or equal to twice the federal poverty level (EPA, 2021).

While the federal definition of environmental justice addresses race, ethnicity, and income, federal recommendations include considering additional demographic factors related to age (pursuant to EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks* [62 Fed. Reg. 19885]) and language to help determine the presence of environmental justice populations. Age populations (younger than age 4 and older than age 65) and "linguistically isolated" populations in which all members in the household age 14 and over speak a non-English language and also have difficulty with English (EPA, 2021) are also considered.

This review uses North Dakota as the reference population and follows federal guidance. The minority, low-income, linguistic, and age populations within the reference population are low; therefore, the application of a 20 percent greater-than threshold compared to the reference population was used to identify potential environmental justice communities for this review. None of the CBGs crossed by the North Bismarck Reroute are considered potential environmental justice populations based on this high level review (Table 3.8.2-6). These desktop results suggest that low-income and age populations (i.e., potential environmental justice communities) are present in the CBGs and, could be affected by the construction and operation of Alternative 5 within the desktop analysis area.

The State of North Dakota commented that environmental justice populations in Bismarck and Mandan could be affected by a release at the Missouri River crossing of Alternative 5. The Native American population in Mandan represents 4.5 percent of the population and approximately 4.3 percent of the Native American population is low income (U.S. Census Bureau, 2021g and 2021h). In Bismarck, the Native American population represents 4 percent of the population, approximately 4 percent of the Native American population is low income (U.S. Census Bureau, 2021e and 2021f). Based on the federal guidance described above, this desktop analysis suggests that low-income and minority populations (i.e., potential environmental justice communities) are not present in Bismarck and Mandan.

Table 3.8.2-6: Environmental Justice Demographic and Socioeconomic Indicators: Income, Language, and Age

State/County Census Block Group (CBG)	Population	Minority Population (%)	Low Income Population (%)	Linguistically Isolated Population (%)	Population Under Age 5 (%)	Population over Age 64 (%)
North Dakota	760,394	16	26	7	7	15
Burleigh	95509	13	17	1	7.0	16
380150110024	1,095	1	7	0	5	36
380150111051	790	7	0	0	4	18
380150111053	2,275	8	7	0	7	4

State/County Census Block Group (CBG)	Population	Minority Population (%)	Low Income Population (%)	Linguistically Isolated Population (%)	Population Under Age 5 (%)	Population over Age 64 (%)
380150114001	959	19	25	0	3	16.0
380150114002	1,824	2	12	0	6	12
Emmons	3,262	3	27	1	6	30.
380299665001	772	2	18	0	6	31
Mercer	8,359	9	22	3	6	19
380579618001	1,292	17	26	8	5	21
Morton	31,118	11	22	1	6	16
380590204001	1,663	5	7	0	5	17
Oliver	1,962	9.0	23	1	8	24
380659612001	1,067	8.0	14	2	9	26
380659612002	895	10	35	0	6	23

Source: EPA, 2022

Note: Gray highlighted cells reflect populations that exceed a demographic or socioeconomic threshold.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. The existing route may require minor ground disturbance to expose, cut, and cap the pipe. Following the capping of the pipe, the area materials would be returned to the excavated areas and the surface would be stabilized and revegetated, minimizing the potential for stormwater runoff to affect turbidity in Lake Oahe. Similar to Alternative 2, the pipeline would no longer be operational; therefore, there would be no potential for a crude oil release, and subsistence and treaty rights would not be affected. This EIS assumes that Dakota Access would use existing transportation infrastructure during the construction of the North Bismarck Reroute and would not build new railways or roads. The use of trucking and/or rail to transport the crude oil during construction of the North Bismarck Reroute could result in effects on subsistence. An increase in the number of trucks and trains carrying crude oil would increase the potential for vehicle collisions with wildlife as well as the inadvertent release of crude oil into terrestrial habitat or aquatic habitat. As described in Section 3.1.6.5, [Reliability and Safety, Impacts and Mitigation] Alternative 5, transportation of oil by truck or rail would likely result in more frequent, lower volume releases. If a crude oil release occurs during rail or truck transportation, the magnitude of the impact would be dependent on the size of the release. As described in Chapter 2, Alternatives, transportation of oil by truck or rail would likely result in more frequent, lower volume releases. These releases could have adverse effects on terrestrial and aquatic resources; therefore, impacts on subsistence could range from negligible to moderate.

The impact of greenhouse gas (GHG) emissions on subsistence resources was a concern identified during Project scoping. There is insufficient infrastructure to accommodate the entire Project volumes via rail. Therefore, some amount of truck transport would be required. Truck transport would generate greater operational GHG emissions as compared to pipeline transportation, but the amount would be negligible (see Section 3.12, Climate Change). GHG emissions on subsistence resources as a result of truck transport are not anticipated to change the patterns of seasonally available species in traditional harvest areas.

In conclusion, construction and operation impacts on subsistence and treaty rights, and therefore impacts on environmental justice communities for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on environmental justice communities for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on environmental justice communities for Alternatives 5 and 2 would not be significant. Therefore, high and adverse disproportionate impacts on environmental justice communities are not anticipated.

3.8.3. Health

This section provides Project background on health concerns in tribal communities, and an analysis of the affected area, impacts, and mitigation from the past and future Project activities under the five alternatives on environmental justice communities (Section 3.8.2.6, [Environmental Justice] Impacts and Mitigation). Numerous sources were reviewed to characterize health issues relevant to tribal communities. The Indian Health Service reports that American Indian and Alaska Native people have lower life expectancies when compared with the general population in the United States. For the time period between 2009 and 2011, the Indian Health Service documented the leading causes of American Indian and Alaska Native death as heart disease, cancer, unintentional injuries (including motor vehicle accidents), and diabetes (IHS, 2019). The agency links disproportionate disease present in tribal communities to disproportionate poverty, cultural differences, and the level of education achieved among other factors (IHS, 2019). The Agency for Toxic Substances and Disease Registry in coordination with the Centers for Disease Control and Prevention created two high-level geospatial screening tools, the Social Vulnerability Index (SVI) and the Environmental Justice Index (EJI), to assist communities and policy makers identify and respond to environmental and/or social factors that may affect public health. Neither tool captures all environmental or health issues a community could face because these tools rely on nationally available datasets. Nevertheless, they are useful screening tools to identify where high environmental burdens may exist. Neither tool provides risk assessments, which seek to quantify the likelihood that a population will experience harm due to a hazardous event. For example, the proximity to hazardous waste site does not constitute an exposure, but rather an environmental burden faced by a community.

The SVI was developed to assist public health officials and emergency response planners to prepare for hazardous events such as natural disasters or anthropogenic events using a mapping tool to identify communities that would likely need support during such events (USDHHS, 2022a). The geospatial tool is based on socioeconomic and demographic indicators by census tract from the U.S. Census Bureau's American Community Survey, 5-year Estimate (2017 to 2020). The indicators are organized into four themes, including socioeconomic status, household characteristics, racial and ethnic minority status, and housing type and transportation, and they are ranked based on their percentile among all census tracts either in the U.S. or in a state. The SVI values range between 0 and 1 with 0 representing the lowest vulnerability and 1 representing the highest vulnerability census tracts. Community attributes associated with higher SVIs generally increase a community's risk for adverse health outcomes during and following a hazardous event. The level of vulnerability for Sioux County, North Dakota, and Corson, Dewey and Ziebach counties, South Dakota, have high levels of vulnerability ranging between 0.7692 and 0.9615.

The EJI identifies communities that face cumulative impacts[55] resulting from environmental burdens on health and that may need help responding to hazardous events. The EJI assigns a ranking of social, environmental, and health vulnerabilities. Health vulnerability is an estimate of individual's self-identified days during the past 30 days that are identified as good physical and mental health days versus unhealthy days (USDHHS, 2023). The EJI tool provides an indicator called High Estimated Prevalence of Poor Mental Health, which is based on poor mental health (greater than or equal to 14 days during the previous 30 days among adults 18 and older) prevalence data at the census tract level and where only local values in the top third of national percentiles (greater than 66.66 percent of all tracts in the dataset) are ranked as "high" prevalence. Sioux County, North Dakota, and Corson, Dewey and Ziebach counties, South Dakota, are characterized as having a high prevalence of poor mental health.

Tribal communities may have unique health issues related to social determinants such as historic trauma, human trafficking, food insecurity, exposure to hazardous pollutants, accidents and injuries, cultural differences, and overall systemic racism such that these communities often bear disproportionate impacts from pollution and other health hazards. The EPA (2019b) states that exposure scenarios "for tribal and indigenous populations differ from the general population exposure scenarios, in that subsistence lifeways and diets are relevant, outdoor activities are prevalent and traditional and cultural activities are frequent." The American Indian Public Health Resource Center, the NDDOH, the Office of Indian Affairs Commission, and the North Dakota Department of Human Services provide data on tribal health disparities. Research indicates that Northern Plains American Indians have some of the worst health disparities in the United States (Warne and Lajimodiere, 2015). Public health conditions in the Project region or state are provided where data is available, and potential Project impacts on the health of the environmental justice communities are addressed in this section.

The following health impact categories are considered potential environmental hazards and topics that were raised during Project scoping:

- Exposure to potentially hazardous pollutants that result in illness associated with pollutants;
- Accidents and injuries related to traffic patterns as well as distance and access to health services, including urgent care;
- Impacts on food choices (e.g., consumption of wild harvested foods) and food security (the lack of consistent access to food); and
- Human trafficking that affects individuals, families, and communities.

[55] The EJI tool defines "cumulative impacts" as "the total harm to human health that occurs from the combination of environmental burden, pre-existing health conditions, and social factors" that may result from long-term exposure to environmental pollution, loss of natural resources, or other resources (USDHHS, 2022b).

The concept of historical trauma was developed in the field of psychology in the 1990s to characterize high rates of psychological stress among indigenous populations (Gone et al., 2019). Historical trauma is defined as "cumulative emotional and psychological wounding, over the lifespan and across generations, emanating from massive group trauma experiences" such as relocation as a result of land cessations through treaties or congressional acts (American Psychiatric Association, 2021). The effects born by this multigenerational, collective experience may include disruption to the sense of community and overall poor physical or mental health.

The SRST provided a letter (Eagle, 2021) from Jon Eagle, Sr., the SRST's THPO, explaining that Tribes attach cultural affiliation to the Missouri River and that past USACE projects impacting the river combined with the DAPL Project have a cumulative impact on their wellness and overall health as a result of historic trauma. Mr. Eagle states that degradation to the natural environment and tribal resources that could be affected by a crude oil pipeline release would contribute to the negative mental and spiritual effects on their communities.

In addition to historic trauma, Richard White, a consulting civil and environmental engineer for the Oglala Sioux Tribe, noted that a release would have a psychological impact on tribal communities. Further, the psychological harm could be manifested in physical health conditions. In the event of release, increased uncertainty about the safety of the water and aquatic resources would be diminished through the timely implementation of emergency response measures in close coordination with tribal communities and conducting PAH fish tissue sampling to support when PAH levels in fish return to pre-release conditions.

While this EIS addresses the spiritual and cultural connection to the land, performing an analysis of all possible community-wide psychological effects that the presence of a pipeline and risk of a crude oil release could have on the surrounding population is outside of the purpose of the environmental analysis required by NEPA. NEPA is a "forward-looking, not remedial, statute," which is intended to require agencies to assess the future effects of future actions (see e.g., *Friends of Congaree Swamp, et al. v. Federal Highway Administration, et al.*, 786 F. Supp. 2d 1054, 1068 [D.S.C. 2011]). NEPA does not ask agencies to examine psychological effects associated with increased risk (see e.g., *New Jersey Department of Environmental Protection v. United States Nuclear Regulatory Commission*, 561 F.3d 132, 141 [3d Cir. 2009]).

3.8.3.1. Past Project Impacts and Mitigation

The 2016 EA did not address Project impacts on health. No health impacts have been reported as a result of Project construction. Project operation to date has not resulted in any crude oil releases that would affect health through inhalation of chemicals, ingestion of contaminated subsistence resources, or physical contact with chemicals. Additionally, work camps were not established during Project construction that contributed to human trafficking.

3.8.3.2. Current Affected Environment and Impacts

The characterization of the affected environment for health impacts examines the possible health impacts on the potentially affected communities (defined in Section 3.8.2.5, [Environmental Justice] Current Affected Environment, as 4 miles north of the Project and 65 miles south of the Project), including the

SRST and the CRST. Baseline indicators that are useful to characterize health effects categories are listed in Table 3.8.3-1. Some of these categories are addressed in other sections of this EIS and are referenced as appropriate.

Table 3.8.3-1: Health Effects Categories

Health Effect Category	Outcomes and Determinants
Exposure to potentially hazardous pollutants	The key health outcomes considered are increases and decreases in documented illnesses or exacerbation of illnesses commonly associated with fugitive dust and pollutants of potential concern. The exposure pathways include inhalation, ingestion, or physical contact.
Accidents and injuries related to traffic patterns, distance and access to health services, including urgent care	The key health outcomes are changes in unintentional injuries with fatal and nonfatal results. The determinants in this category include traffic patterns as well as distance and access to emergency services.
Impacts on food choices (e.g., consumption of wild harvested foods) and food security (the lack of consistent access to food)	The key health outcomes are nutrition levels. The determinants include diet composition, food security, and the consumption of subsistence foods.
Human trafficking	The key health outcomes are infections and infectious disease, physical abuse, malnourishment, sexually transmitted disease, depression, anxiety, suicidal thoughts, and substance abuse. The determinants include poverty, lack of job opportunities, female gender, lack of policy, and/or enforcement.

Exposure to Potentially Hazardous Materials

Human exposure to potentially hazardous materials can cause or exacerbate certain health conditions and sometimes increase the risk of chronic illnesses. Respiratory exposure pathways linked to air emissions may include criteria pollutants as defined under National Ambient Air Quality Standards (40 CFR Part 50) and non-criteria pollutants, such as volatile organic compounds (VOCs) and hazardous air pollutants (HAPs). Limited research has demonstrated long-term health effects on workers in the oil and gas industry, particularly as a result of cleanup of a crude oil release, include alterations to hematological, hepatic, pulmonary, and cardiac functions 7 years after exposure (D'Andrea and Reddy, 2018).

Monitoring data for air quality monitoring stations in the Project Area from 2003 to 2013 showed pollutant levels for sulfur dioxide, nitrogen dioxide (NO_2), ozone, and particulate matter did not exceed state or federal ambient air quality standards at any of the state-operated monitoring sites (see Section 3.11, Air Quality and Noise).

Ingestion exposure of hazardous materials to humans could include chemicals such as mercury or pesticides identified in traditional foods (e.g., fish) that bioaccumulate in the food web or through contaminated drinking water. Studies have documented that acute and chronic exposures related to consumption of traditional foods that may contain chemicals in oil pose risks for serious health affects including chronic diseases such as diabetes and cancer (Akande et al., 2015; Assembly of First Nations, 2007). Currently, baseline health data regarding the consumption of subsistence resources exposed to crude oil chemicals within the potentially affected communities is not available, nor is baseline data available for the ingestion of contaminated drinking water. Project-related crude oil releases have not occurred on Lake Oahe.

Physical contact with chemicals in oil is more common among oil industry workers and cleanup workers than residential populations who are potentially exposed during a crude oil release. Acute effects after exposure to crude oil releases among cleanup workers are respiratory, eye and skin irritation, headache, nausea, dizziness, and fatigue. Since it began operating nearly 6 years ago, there have been no releases at the Lake Oahe crossing or anywhere else along the nearly 1,200-mile mainline.

Accidents and Injuries

In North Dakota, accidents and injuries are an important cause of mortality. Unintentional injury (injury or death other than suicide and homicide) is the fourth leading cause of death in the state, while assault (homicide) is not within the top ten causes of mortality (CDC, 2021a). In terms of traffic accidents, the number of fatalities fluctuated from 100 to 170 between 2010 and 2019 (NDDOT, 2019). The greatest number of fatalities (170) was recorded in 2012 and the number of fatalities has generally declined to 100 fatalities in 2019. The MHA Nation commented that on the Fort Berthold Reservation, the number of fatalities decreased by five per year after the pipeline began operating in 2017 due to the reduction of truck transport of crude oil.[56]

In South Dakota, unintentional injury (injury or death other than suicide and homicide) is the third leading cause of death in the state, while assault (homicide) is not within the top ten causes of mortality (CDC, 2021b). In 2018, injuries resulting from vehicular accidents were the leading cause of death for South Dakotans between the ages of 1 and 44 years (South Dakota Department of Health, 2020). In terms of traffic accidents, the number of fatalities fluctuated between 28 and 55 between 2013 and 2019 (Department of Public Safety, 2019). Vehicular accidents are the second leading cause of injury-related deaths. Overall, the injury-related deaths among Native Americans were 2.8 times higher than the White population (South Dakota Department of Health, 2020).

Access to emergency care is available on the SRST and the CRST Reservations. The Fort Yates Hospital, located near the Missouri River on the SRST Reservation at Fort Yates, North Dakota, is a fully accredited 12-bed hospital. The hospital emergency department offers 24/7 care and is designated as a Level IV trauma center (IHS, 2021a).

In 2012, the Eagle Butte Hospital in Eagle Butte, South Dakota, was replaced with an alternative rural health center to which the CRST has access. The facility has an 8-bed acute care nursing unit, 2-bed low risk birthing unit, emergency room, expanded outpatient department, dental, community health department, and other support services. Additionally, the CRST operates four satellite health stations which offer basic ambulatory services at Cherry Creek, Red Scaffold, Swiftbird, and Whitehorse, South Dakota (IHS, 2021b).

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[56] Declaration of Mark N. Fox, April 19, 2021, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al.*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-1796 and 17-cv-267)

Food and Subsistence Activity

Subsistence fishing and hunting are used to supplement diets throughout the year, as discussed in Section 3.8.2.5, [Environmental Justice] Current Affected Environment, Subsistence. Effects on the diet considers how changes in wildlife habitat, hunting, fishing, and gathering practices and food choice affects the diet of the tribal communities. Nutritional surveys are effective at assessing dietary intake; however, none are available for the potentially affected communicates. Effects on food security are typically related to the cost of living, access, and income. The currently available data presented in the subsistence discussion above suggests that the tribal populations have limited access to healthy food (referring to the percentage of the population who are low income and do not live close to a grocery store).

Human Trafficking

In the Bakken oil region of North Dakota, increased oil and gas extraction activities are associated with human traffickers near the Fort Berthold Reservation. The traffickers take advantage of work settings that are physically remote, and therefore victims are often isolated from community support networks and government oversight and may have less access to protective services, advocates, and law enforcement. The effects on tribal communities, particularly indigenous women and children, increased as the result the rapid rise of oil and gas workers in the Bakken region (University of Colorado Boulder, 2020). The population increase, which is often housed in work camps, may strain law enforcement. A review of violent victimization trends attributed to the work camps in the Bakken region showed an increase in violence against Native Americans and Blacks that was 2.5 times higher than corresponding rates for Whites (University of Colorado Boulder, 2020).

3.8.3.3. Impacts and Mitigation

Health stressors as a result of a crude oil release could be greater on tribal communities that already face health disparities such as diabetes, heart disease, cancer, substance abuse, infant mortality, and suicide. However, as assessed in Section 3.8.2, Environmental Justice, the risk of a crude oil release was determined to be minor and mitigation measures are described in Section 3.1, Reliability and Safety. In this section, health impacts are assessed based on the predicted severity of the potential impact, considering the nature of the health outcome, duration, frequency and magnitude, and likelihood of the impact.

Alternative 1

Alternative 1 would require extensive earthwork to remove the existing pipeline by excavation or dredging. Dakota Access estimates that construction to remove the pipeline would occur over multiple seasons and could take 6 to 20 years or more of construction, including several seasons for restoration. Based on the amount of work required, including site preparation, dredging, spoil storage and disposal, and restoration, the amount of direct construction emissions associated with Alternative 1 would result in a short- to long-term increase in criteria pollutants and HAPs during the removal construction activities, but would not impact air quality (see Section 3.11, Air Quality and Noise). Also, during pipeline removal no exposure to pollutants through ingestion or physical contact are anticipated.

Project-related traffic would require intermittent lane or highway closures to accommodate vehicle access to the Project Area. While activities would occur throughout several years of construction and represent a long-term impact, mitigation measures such as developing a detailed construction schedule and a traffic management plan would minimize the amount of construction traffic on roads during peak use. The plan would outline the requirements for training on transportation safety, safety meetings, and accident investigation protocols. The overall impacts on transportation and traffic—and thereby increases in vehicular accidents, human injuries, and fatalities—would be minor.

Project non-related injuries/illnesses requiring medical treatment at local medical facilities could be minimized through the implementation "fit-for-duty" screenings of incoming construction workers.

The impacts on subsistence food during the removal of the pipeline via excavation that may include dredging would be the same as described under Alternative 1 for Subsistence (in Section 3.8.2.6 [Environmental Justice]), which was assessed as is a significant impact on subsistence resources. The potential to affect the nutritional intake would be dependent upon the percentage of traditional food harvested. Nutritional shortages could be offset by the use of store bought foods, provided that access to nutritionally comparable options is available and that these options are affordable. Therefore, health impacts would range from minor to major depending on these variables.

The influx of construction workers would find temporary lodging in hotels, motels or other rental units throughout the region rather than concentrated in work camps, limiting the potential for human trafficking.

Alternative 1 would also have indirect effects on tribal oil and gas extraction. The MHA Nation commented that the Tribe would lose millions of dollars in tax and royalty revenue from the Project while oil is not flowing through the pipeline that transports a large percentage of the MHA Nation's oil production to market. Approximately 80 percent of the MHA Nation's budget is derived from oil production and based on their calculations, the estimated revenue loss would exceed $160,000,000 over a 1-year period with annual health insurance costs totaling about one quarter of this amount. The oil tax and revenue funds are used by the MHA Nation for programs such as drug enforcement, health clinics, health insurance, child and elder care services, and emergency management centers.

There would be no operational impacts on health under Alternative 1 resulting from the operation of the pipeline itself, because the pipeline would be abandoned by removal and the Project Area would be restored to pre-construction conditions.

In conclusion, the construction and operational impacts on health associated with Alternative 1 are not expected to be significant, with the exception of food acquisition.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Under Alternative 2, the pipeline would be removed from service with limited construction activity in order to purge, cut, and cap the pipeline and abandon it in place. Air emissions of criteria pollutants and

HAPs would be less that the original construction. The in-place abandonment of the pipeline would result in a negligible, temporary impact on air quality (see Section 3.11, Air Quality and Noise). Also, during pipeline abandonment no exposure to pollutants through ingestion or physical contact are anticipated.

Accidents and injuries related to road or extended lane closures could be expected from this alternative as a result of construction traffic. Localized, temporary, negligible impacts on transportation and traffic would result from Alternative 2. Vehicular accidents are not expected to increase as a result of the abandonment activities.

Construction activities may impact subsistence resources in the Project Area because these resources may be temporarily inaccessible or may temporarily disperse from the construction area (with the exception of non-mobile species such as mussels) due to human presence, lighting, and noise. Species and access would return to prior conditions after construction is completed. Impacts would be temporary, and minor on the nutritional health of subsistence users.

The number of construction workers needed to abandon the pipeline in place would be less than the original pipeline construction. These workers would find temporary lodging in hotels, motels or other rental units. Therefore, human trafficking, which is typically associated with increased populations housed at work camps, is not anticipated.

There would be no operational impacts on health under Alternative 2 as the pipeline would be abandoned in place and cease to operate.

In conclusion, the impacts on health discussed above from Alternative 2 are not likely to be significant. Therefore, high and adverse disproportionate impacts on environmental justice communities are not anticipated.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5 below.

Alternative 3

In the Remand Analysis (USACE, 2018), the USACE concluded that human health impacts would be possible if a crude oil release were to occur in or near Lake Oahe. The health effects could result from the inhalation of volatile chemicals, through the digestion of fish that could become contaminated (see Section 3.5.2, [Wildlife and Aquatic Resources] Aquatic Resources), or through drinking contaminated water—either through water intakes from Lake Oahe or direct consumption from the lake. The USACE concluded that the likelihood of health impacts resulting from a crude oil release would be very low for each of these potential human health pathways.

Accidents and injuries to the first responders (e.g., inhalation of pollutants and physical contact with crude oil) may be temporary or short- to long-term and minor to major depending upon the duration and type of pollutant exposure that could occur. However, using appropriate protective gear and following safety protocols would limit the severity of the health impact. The GRP and FRP address training and protective gear for response personnel (Appendix F). The potential magnitude of the impact could range from minor to major.

Accidents and injuries during the remediation efforts for a crude oil release could change traffic patterns due to the mobilization of emergency response vehicles. An emergency response plan would be implemented and would include interagency coordination including coordination with law enforcement, Tribes, and local and highway departments. The impacts on road traffic during a crude oil release response would be minor to moderate and could be local or regional, depending on the location of a release and duration of remediation. The need to route traffic away from the area of a release in a safe manner would minimize the potential for vehicular accidents.

Emergency responders would be a combination of local and non-local personnel. Non-local responders would seek rental housing rather being housed in work camps. Therefore, human trafficking, which is typically associated with increased populations housed at work camps, is not anticipated.

As identified in Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3] Modeled Release Scenarios, the likelihood of each modeled release scenario is remote to very unlikely. If any of the modeled release scenarios were to occur, impacts would range from minor to major. Mitigation measures have been developed to further reduce the likelihood and intensity of these potential impacts as described in the GRP and FRP (Appendix F) and compliance with PHMSA's pipeline safety regulations under 49 CFR 194.105. The consequence of a WCD crude oil release combined with the likelihood of occurrence results in a negligible to moderate risk and therefore the health impacts on environmental justice communities would not be significant.

Alternative 4

Under Alternative 4, the USACE would allow for the operation and maintenance of the existing pipeline and continued transport of crude oil. The health impacts would be similar to those discussed under Alternative 3. However, as discussed in Alternative 3, the likelihood of any crude oil release in or near Lake Oahe is remote to unlikely. Since it began operating nearly 6 years ago, there have been no releases at the Lake Oahe crossing or anywhere else along the nearly 1,200-mile mainline.

Operational impacts would be similar to Alternative 3. However, under Alternative 4 Dakota Access would implement additional easement conditions, including:

- Developing a plan for providing an alternative source of clean agricultural or drinking water should a crude oil release from DAPL occur and reach water intakes (see Section 3.3.1.3, [Water Resources Surface Waters] Impacts and Mitigation).
- Conducting PAH fish tissue sampling in accordance with sampling protocols that the State of North Dakota utilizes for its monitoring program on the lake for methyl-mercury analysis to support when PAH levels in fish return to pre-release conditions following a crude oil release from DAPL, should one occur (see Section 3.5.2, [Wildlife and Aquatic Resources] Aquatic Resources).
- Conducting systematic subsistence studies for the SRST and the CRST (see Section 3.8.2.6, [Environmental Justice] Alternative 4).

In conclusion, health impacts associated with Alternative 4 would not be significant. Therefore, high and adverse disproportionate impacts on environmental justice communities are not anticipated.

Alternative 5

The 111-mile-long North Bismarck Reroute would have the potential to impact health during construction. Construction activities would create non-road and on-road gasoline and diesel emissions as well as fugitive dust from earth-disturbing activities. These activities would result in temporary increases in criteria pollutant emissions and HAPs. The pollutant emissions would represent a minor, temporary impact on air quality in the Project vicinity.

Construction impacts on health related to injuries and accidents, food/nutrition, and human trafficking would be similar to those described under Alternative 1.

Operation impacts on health would be similar to those described under Alternative 3.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below. The USACE assumes that existing roads and rail would be used.

The use of truck and/or rail to transport the crude oil during construction of the North Bismarck Reroute could result in effects on nutritional health for subsistence users. An increase in the number of trucks and trains carrying crude oil would increase the potential for vehicle collisions with wildlife as well as the inadvertent release of crude oil into terrestrial habitat or aquatic habitat. If a crude oil release occurs during rail or truck transportation, the magnitude of the impact would be dependent on the size of the release. As described in Chapter 2, Alternatives, transportation of oil by truck or rail would likely result in more frequent, lower volume releases. These releases could have adverse effects on terrestrial and aquatic resources; therefore, impacts on subsistence could translate into human health impacts if alternative comparable food options were not available. Truck transport would generate greater operational GHG emissions as compared to pipeline transportation (see Section 3.12, Climate Change). GHG emissions on subsistence resources as a result of truck transport are not anticipated to change the patterns of seasonally available species in traditional harvest areas and, therefore, would not represent a considerable impact on nutrition.

Research has demonstrated that traffic accidents and fatalities attributable to daily tanker truck trips average about six times higher than from pipeline accidents (see Section 3.9, Transportation and Traffic). The impact of accidents or injuries related to truck transportation would be likely short-term and moderate, resulting in a moderate risk.

The transition to truck and/or rail to transport the crude oil extracted from MHA Nation wells is anticipated to occur gradually (months to a year), with a need to restart loading/offloading terminals and hire more workers. During the transition to truck and/or rail transport, the economic impact on MHA Nation programs related to health would be temporary.

In conclusion, construction and operation impacts on overall health for Alternative 5 would not be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Impacts associated with Alternative 5 also includes the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on health for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on health for Alternatives 5 and 2 would not be significant.

3.9. Transportation and Traffic

This section provides an analysis of the affected area, impacts, and mitigation from the past and future Project activities under the five alternatives on transportation and traffic. The past affected environment is described in the Project Background (Section 3.9.1). Sections 3.9.2 and 3.9.3 address the current affected environment and associated impacts and mitigation, respectively.

3.9.1. Project Background: Affected Environment and Impacts

During construction, the Project was accessed from both private and public roads, including ND Highway 1806 on the west side of Lake Oahe and ND Highway 1804 on the east side of Lake Oahe, and a permanent access road owned by Northern Border Pipeline Company (Northern Border). Near the Project, both highways are two-lane roads.

On ND Highway 1806, there was a daily average traffic count of approximately 1,610 vehicles in 2014 and approximately 1,560 vehicles in 2016. The daily average traffic count on ND Highway 1804 was 175 vehicles in 2014 and 210 vehicles in 2016. These traffic counts are based on historical data contained in the North Dakota Department of Transportation Information Map (NDDOT, n.d.).

The Project did not require the construction of new roads, but some locations required modifications (e.g., turn-off improvements). During the HDD construction, personnel entered the pipeline right-of-way from ND Highway 1806. On the east side of the lake, construction personnel accessed the Project Area from ND Highway 1804 and traveled on Northern Border's existing permanent access road to reach the Project right-of-way.

Six types of vehicles were used during construction of the Project: buses, dump trucks, fuel trucks, vacuum trucks, tractor-trailers carrying heavy construction equipment, and Environmental Inspector vehicles (Table 3.9.1-1). All vehicles complied with federal, state, and local regulations, including local weight limitations and restrictions on public roadways. Grading was necessary to allow construction equipment safe access to the Project right-of-way from ND Highway 1806. Dakota Access removed soil or other detritus that fell onto roadway surfaces from construction equipment. No roads were closed as a result of Project construction.

Dakota Access implemented safety measures to keep non-emergency and emergency vehicle passage on roadways open during construction. Flaggers and signage were used to slow or direct traffic while construction vehicles entered the right-of-way. Additionally, law enforcement implemented controlled access points on ND Highway 1806 for non-construction-related purposes. Implementation of these measures was coordinated between local stakeholders and at the discretion of local law enforcement.

With implementation of the Project's traffic mitigation measures, adherence to applicable regulations and limited lane closures, the impacts on transportation and traffic during construction were localized, temporary, and minor. Therefore, construction impacts on traffic were not significant.

Table 3.9.1-1: Vehicles Used during Construction

Vehicle Type	Maximum Number of Vehicles	
	Construction	Operations
Buses	2	0
Pickup trucks	22	2
Dump trucks	8	0
Tractor-trailers	13	0
Fuel trucks	2	0
Vacuum trucks	2	0

Existing local, state, and approved private roads have been used for routine operations and maintenance activities. Vehicles used during operations generally include pickup trucks (see Table 3.9.1-1). One monitor performs routine visual inspection and valve maintenance twice per month. There have been no impacts on traffic patterns from routine operations and maintenance.

3.9.2. Current Affected Environment

Private and public roads provide access to the Project, including ND Highway 1806 on the west side of Lake Oahe and ND Highway 1804 on the east side of Lake Oahe, and a permanent access road owned by Northern Border. The most recent data indicate that in 2019, the daily average traffic count was approximately 1,170 vehicles on ND Highway 1806 and approximately 82 vehicles on ND Highway 1804 (NDDOT, n.d.), indicating a reduction in daily traffic on both roads since the Project was constructed.

Existing local, state, and approved private roads are used for routine operation and maintenance activities. One monitor, traveling by pickup truck, performs routine visual inspection and valve maintenance twice per month.

3.9.3. Impacts and Mitigation

Five alternatives are considered with regard to their construction and operations impacts on traffic and transportation.

3.9.3.1. Alternative 1

Alternative 1 would require extensive earthwork and engineering to remove the existing pipeline. Dakota Access estimates that construction to remove the pipeline would occur over multiple seasons and would take 6 to 20 years or more to complete with the use of standard large construction vehicles and equipment.

Under Alternative 1, Dakota Access would mobilize large construction equipment to the Project Area. Existing highways would be used by workers to travel between the Project Area and their housing (e.g., rental units, hotels, campgrounds, or RV parks) and to transport the construction equipment to the Project Area. Project-related traffic volume increases by construction workers would occur up to year-round but would likely comprise a small share of traffic. Therefore, Project-related traffic would not contribute to congestion or delays.

Project-related road improvements to accommodate large construction vehicles that exceed existing size or weight standards are anticipated as well as intermittent lane or highway closures to accommodate vehicle access to the Project Area. The USACE assumes that the duration of closures would be several hours for access to the Project and days to weeks for road improvements, but the frequency of closures is unknown. These activities would occur throughout several years of construction and represent a long-term impact. Mitigation measures such as developing a detailed construction schedule and a construction execution plan would allow lane closures to be scheduled at night and detours to be developed and advertised in advance to allow road users to make alternate plans. Therefore, traffic delays due to Project-related road closures would be long-term, localized and minor.

Although regular boating traffic data along this area of the river is not available, there are no boat access points or public swimming beaches within 1 mile of the Project Area. During the phased pipeline removal, river flow would be diverted to the opposite side of the lake from the cofferdams. Any boat traffic would be diverted around the cofferdams. Therefore, the construction phase of pipeline removal would have a long-term, localized, moderate impact on boat traffic.

There would be no operational impacts under Alternative 1 because the pipeline would be abandoned by removal and the Project Area would be restored to pre-construction conditions. Prior to removal, the pipeline would be shut down and there would be no impacts on transportation and traffic as a result of this shutdown.

In conclusion, impacts on transportation and traffic from construction and operation associated with the pipeline shutdown and removal under Alternative 1 are not expected to be significant.

However, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. During the permitting and construction period, other modes of transportation (truck or rail) are likely to be in demand by current DAPL Project shippers. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment by removal of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also are likely to include additional demand for truck and rail shipping during an interim period as well as the transportation impacts of constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

3.9.3.2. Alternative 2

Under Alternative 2, the pipeline would be removed from service with limited construction activity to purge, cut, and cap the pipeline. No road or extended lane closures would be expected from this alternative as a result of construction traffic. Localized, temporary, negligible impacts on transportation and traffic would result from Alternative 2. There would be no operational impacts under Alternative 2 as the pipeline would be abandoned in place and cease to operate. Prior to abandonment, the pipeline would be shut down, and there would be no impacts on transportation and traffic as a result of this shutdown.

In conclusion, impacts on transportation and traffic from construction and operation associated with the pipeline shutdown under Alternative 2 are not expected to be significant.

However, under Alternative 2, Dakota Access would likely seek to construct and operate a pipeline reroute as described under Alternative 1. During the permitting and construction period, other modes of transportation (truck or rail) are likely to be in demand by current DAPL Project shippers. Therefore, impacts associated with Alternative 2 are likely to include additional demand for truck and rail shipping during this interim period. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the likely combined impacts of Alternatives 2 and 5 are described under Alternative 5, below.

3.9.3.3. Alternative 3

Under Alternative 3, the easement would allow for the operation and maintenance of the existing 30-inch diameter buried pipeline, and the continued transport of crude oil from North Dakota to Illinois via pipeline. There would be no new construction activity associated with Alternative 3 as the pipeline is already constructed; therefore, there would be no construction-related traffic impacts.

Vehicles used during pipeline operation generally include pickup trucks (see Table 3.9.1-1). Operations personnel would perform routine visual inspection and valve maintenance twice per month. Impacts on traffic patterns or transportation resulting from routine operations and maintenance would be long-term, localized, and negligible. As a result, Alternative 3 would have no significant effects on transportation and traffic patterns.

Operation of the Project would continue to have a moderate beneficial effect on transportation and traffic in eliminating the need for tanker trucks and trains to transport the crude oil, including routes through Morton County. Continued use of transportation via pipeline for the Project would not increase wear and tear on public roads, traffic on roads and railways, noise pollution adjacent to roads, exhaust from diesel combustion, and pollution from potential releases during the filling operations for trucks. Continued operation would also benefit public safety as it would not contribute to increased accidents or fatalities attributable to truck or rail shipments. For hazardous liquid transportation, the number of incidents resulting in serious injuries or fatalities is greater for truck or rail than pipeline (per volume transported) (Furchtgott-Roth and Green, 2013; PHMSA, 2018). The rate of all incidents resulting in a release of crude oil is also greater for truck and rail transportation; for pipelines, an incident occurred approximately once every 720 million gallons of crude oil shipped, as compared with once every 50 million gallons shipped by rail and once every 55 million gallons shipped by truck (PHMSA, 2018) (see detailed discussion in Section 3.1.6.5, [Reliability and Safety, Impacts and Mitigation] Alternative 5).

Implementing Alternative 3 would not increase the number of trains needed for transportation of crude oil out of North Dakota and specifically through Morton County (crude oil trains do not pass through Emmons County). For comparison, if the pipeline was not in operation and the crude oil were to be transported by rail, an additional approximately 3.5 loaded crude oil trains (100 cars each) would pass through Morton County each day. This would only account for approximately 260,000 bpd of the crude oil from the Optimization Project due to limited terminal loading capacities. As a result, rail operation would also require either additional construction of higher capacity terminals and rail lines or supplemental transportation via truck or pipeline.

A crude oil release during pipeline operations would affect road and waterway transportation and traffic patterns. Section 3.1.6, [Reliability and Safety, Impacts and Mitigation] Alternative 3, details 18 WCD crude oil release scenarios. While each of these modeled scenarios has a different range of effect, the effects on transportation are similar across all 18 scenarios. Roads and waterways could be temporarily closed until remediation is complete, and a variety of response vehicles would increase road and/or water traffic, depending on the extent of the release. Additional traffic, restrictions, and potential closures would result in changes to traffic patterns and traffic delays on roads. The effects on road traffic during a crude oil release response would be temporary to short-term, local or regional, depending on the location of the release and duration of remediation, and minor to moderate in impact. The likelihood of a WCD release during pipeline operation is remote to very unlikely. The minor to moderate impacts on road traffic in combination with a remote to very unlikely release likelihood results in a negligible to minor risk for road traffic and transportation.

Boating traffic data along this area of the river is not available, but waterway traffic consists primarily of recreational vessels and non-commercial fishing vessels. Impacts on recreational boating are described in Section 3.6.3, [Land Use and Recreation] Recreation and Special Interest Areas, and would also apply to use of boats for subsistence fishing. In the event of an in-water WCD crude oil release, there would likely be temporary to short-term, localized to regional, moderate to major impacts on river transportation, as parts of the river would be closed off to boat traffic during remediation efforts. Given the likelihood of these occurrences as remote to very unlikely, the risk level would be negligible to moderate.

In conclusion, Alternative 3 is most likely to result in beneficial impacts on transportation and traffic compared with the other alternatives, but a crude oil release may result in negligible to moderate risks to transportation and traffic that would not be considered significant.

3.9.3.4. Alternative 4

Similar to Alternative 3, under Alternative 4, the USACE easement would allow for the operation and maintenance of the existing pipeline and continued transport of crude oil. There would be no construction activity associated with Alternative 4; therefore, there would be no impacts on transportation and traffic patterns.

Operational impacts on traffic and transportation under Alternative 4 would result in similar impacts as Alternative 3. However, additional easement conditions imposed under Alternative 4 would minimize the likelihood and impact of a WCD crude oil release during operation of the pipeline, thereby reducing the severity of impacts on traffic in response to a release, although it is unknown to what extent. Therefore, impacts on and risk to transportation and traffic would be similar to or less than as for Alternative 3: minor to major impacts on traffic and transportation during cleanup and remote to very unlikely likelihood, resulting in a negligible to moderate risk level.

In conclusion, Alternative 4 is most likely to result in beneficial impacts on transportation and traffic, as described for Alternative 3. The negligible to moderate risks to transportation and traffic resulting from a crude oil release would not be considered significant.

3.9.3.5. Alternative 5

This EIS assumes that an alternate pipeline route would be similar to the North Bismarck Reroute as identified in Section 2.6.3, Alternative 5: North Bismarck Reroute. The 111-mile route of the North Bismarck Reroute is estimated to require 85 county road crossings, 7 highway crossings (including

Interstate 94, U.S. Route 83, and 5 state highways) and 4 railroad crossings (see Appendix E, Alternative 5 North Bismarck Reroute Right-of-Way and Centerline Potentially Affected Resources). Depending on the crossing method used, road and rail line crossings would require short-term shoulder or lane closures and associated traffic delays. The road corridors used during construction would have various traffic volumes and size and weight restrictions The area of the North Bismarck Reroute is served by two four-lane divided highways (Interstate 94 and U.S. Route 83), as well as two-lane state or county roads and unpaved roads. It is assumed that construction-related traffic volumes would increase, lane or road closures would occur, and road improvements would occur.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. Activities such as capping and removal at various locations would result in additional truck and worker travel on roads in the region.

Under Alternative 5, Dakota Access would mobilize construction crews and large construction equipment to the locations required for the North Bismarck Reroute and the about 100-mile pipeline abandonment. Existing highways would be used by workers to travel between worksites and their housing (e.g., rental units, hotels, campgrounds, or RV parks) and to transport the construction equipment to worksites. Project-related traffic volume increases by construction workers would occur year-round but would likely comprise a small share of traffic. Project-related road improvements to accommodate large construction vehicles that exceed existing size or weight standards are anticipated as well as intermittent lane or highway closures to accommodate vehicle access to the worksites along the pipeline route.

Mitigation measures such as a detailed construction schedule and a traffic mitigation plan would be prepared to schedule lane closures or equipment and material delivery during off-peak traffic hours, provide advance notice of road closures and detours, and implement traffic control measures (e.g., flaggers, signage, barriers) to minimize effects on traffic and transportation. The North Bismarck Reroute would generate traffic regionally during the entire construction period, but the timeframe for completion of specific road crossings or use of local road segments for vehicle access to specific Project segments would be shorter. Accordingly, impacts on traffic volume and traffic delays due to the Project would be short-term, localized, and minor.

During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below. If Project shippers seek to transport the oil using rail or trucking to meet the Project’s stated purpose and need, this EIS assumes that existing transportation infrastructure would be used. The number of trains and trucks that would be used as a substitute for the pipeline would be affected by the availability of those modes of transportation and the cost of those modes of transportation as compared to the pipeline, which would affect the amount of oil transported.

Transportation of the entire Optimization Project by rail would not be possible. The State of North Dakota provided information regarding the capacity of rail to transport the crude oil if the pipeline were not in operation. In 2014, railroads in North Dakota transported up to 800,000 barrels of oil each day. However, since that time, the NDPSC provided the declaration of William Rennicke, a Partner with Oliver Wyman, to the U.S. District Court explaining that the Fixing America’s Surface Transportation Act restricted the use of certain railcars to transport crude oil, resulting in a crude oil tank car fleet that has shrunk by 58 percent, or to approximately 300,000 bpd.[57] Further, there is only one rail facility within 500 miles of the DAPL Project's terminus in Illinois capable of unloading trains of crude oil. That terminal (the Gateway Terminal in Sauget, Illinois) can unload only one train of 96 cars per day (approximately 67,200 bpd). Even if other rail terminus points were identified to handle the capacity, Mr. Rennicke states that some loading facilities in the Bakken Region that were available in 2014 have been shut down since the DAPL Project was put into service. Moving the Project's volume back to rail would require additional time to bring these closed facilities back online, which may not be possible during the time period that the DAPL Project would be shut down while a reroute is permitted and constructed. Therefore, a lack of loading and unloading capacity likely would remain a substantial constraint on rail capacity.

If the pipeline were not in operation and a comparable volume of crude oil was capable of being transported by rail, approximately 3.5 loaded crude oil trains (100 cars each) would pass through Morton County each day. The increase in rail tank cars to transport the oil would result in more congestion and delays on segments of the rail network and affect rail service for other industries that depend on rail transportation for shipping. The transportation bottleneck is related to limited terminal capacity rather than rail capacity; therefore, depending on the volume of rail cars used for crude oil shipment, the impact on rail transportation would likely be minor to moderate.

If the pipeline were not in operation and crude oil was instead transported by road, a fleet of over 15,000 tanker trucks driving around the clock would be required to transport the crude oil from the Optimization Project. This would include approximately 5,000 tanker trucks being filled with product, 5,000 tanker trucks hauling product to the appropriate facilities, and another 5,000 empty trucks returning from their deliveries ready to be filled. As with rail traffic, the limited capacity of loading/unloading facilities and trucks is likely to constrain truck transportation volumes. Nevertheless, the increase in road traffic from the additional tanker trucks would have a noticeable short-term, moderate impact on local traffic patterns, with potential congestion near the filling locations, which are not near the Project Area. Truck traffic would also have a minor impact due to the increased wear and deterioration of roads and highways, especially near the filling locations, resulting from the increased heavy vehicle traffic.

The increase in rail and truck traffic would also harm public safety by increasing accidents or fatalities attributable to truck or rail shipments. For hazardous liquid transportation, the number of incidents resulting in serious injuries or fatalities is greater for truck or rail than pipeline (per volume transported) (Furchtgott-Roth and Green, 2013; PHMSA, 2018). The rate of all incidents resulting in a release of crude oil is also greater for truck and rail transportation; for pipelines, an incident occurred approximately once every 720 million gallons of crude oil shipped, as compared with once every 50 million gallons shipped by rail and once every 55 million gallons shipped by truck (PHMSA, 2018) (see detailed discussion in Section 3.1.6.5, [Reliability and Safety, Impacts and Mitigation] Alternative 5).

If a crude oil release occurs during rail or truck transportation, the magnitude of the impact would depend on the size of the release. As described in Section 2.4, Alternative Transportation Methods, transportation of oil by truck or rail would likely result in more frequent, lower volume crude oil releases.

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[57] Second Declaration of William J. Rennicke, June 8, 2020, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al.*, United States District Court for the District of Columbia, Case No. 1:16-cv-1534-JEB.

In conclusion, construction and operational impacts on transportation and traffic resources for Alternative 5 would be minor to moderate, and not considered significant.

Alternative 5 results from abandonment of the Lake Oahe Crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The extensive construction impacts associated with Alternative 1 would not have significant impacts on road or river traffic, and the combined construction and operational impacts on transportation and traffic for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on transportation and traffic for Alternatives 5 and 2 also would not be significant.

3.10. Hazardous Waste

The EPA defines hazardous waste as waste that is dangerous or potentially harmful to human 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 and the Resource Conservation and Recovery Act.

3.10.1. Project Background: Affected Environment and Impacts

A review of regulated facilities for hazardous materials near the Project Area was conducted by searching online records maintained by the EPA (U.S. Environmental Protection Agency, 2014 as cited in USACE, 2016). There were no recognized Radiation Information Database, Brownfield, Superfund, Toxic Release Inventory, or air emission sites within 1 mile of the Project Area. No operating sensitive receptors, such as schools or hospitals, were reported within at least 1 mile, including sensitive tribal receptors. Additionally, there were no National Pollutant Discharge Elimination System discharge sites within 1 mile of the Project Area.

As described in the 2016 EA, there was potential for temporary impacts on public safety from hazardous material use for the Project; however, no impacts from hazardous materials during construction occurred. Because there were no regulated sites found within the 1-mile search radius of the Project Area, no impacts on the Project Area, Project media, or worker safety occurred. Dakota Access' UDP was used during all Project construction activities to direct activity and minimize impacts in the event contamination was encountered during construction. However, no unanticipated hazardous materials were discovered during construction. As referenced in the 2016 EA, any hazardous materials discovered, generated, or used during construction were managed and disposed of in accordance with applicable local, tribal, state, and federal regulations. Therefore, past impacts that occurred during construction were not significant.

3.10.2. Current Affected Environment

No substantial changes in the affected environment have occurred since the 2016 EA.

3.10.3. Impacts and Mitigation

Five alternatives are considered with regard to construction and operational impacts from hazardous waste.

3.10.3.1. Alternative 1

Under Alternative 1, the construction activities required to remove the pipeline and restore the Project Area to pre-pipeline conditions would generate a large amount of solid waste including hazardous wastes, non-hazardous wastes, special wastes, and universal wastes. Implementation of Alternative 1 would have short-term to long-term impacts dependent on volume of waste generated and how quickly the waste is characterized, profiled, and transported to the disposal facility. Activities to abandon the pipeline by removal would have a moderate impact due to the complexity of managing large volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste.

Solid waste management considerations would include the generation of the following potential waste streams (this list may not be all inclusive, and other waste streams could be generated):

- Removal of existing crude oil from the pipe
- Decontamination of the pipe, which would generate solvent waste and oily water waste
- Demolition concrete wastes
- Petroleum-impacted soils from releases
- Petroleum-impacted waters from releases
- Release-absorbent material, if used

The waste streams being generated would need to be appropriately characterized, managed, and disposed of in accordance with local, tribal, state, and federal solid and hazardous waste regulations at a minimum with 40 CFR 261.

Each waste stream generated would need to be appropriately characterized to determine the type of solid waste: hazardous, non-hazardous, special, or universal. The solid waste would need to be staged within the Project Area while characterization takes place, which could require additional regulation precautions and would be a critical aspect to manage. Full-time oversight would be required to execute this alternative appropriately to manage and mitigate the risks associated with cradle to grave requirements. In other words, the waste generators are responsible for all hazardous waste they create from the moment it is generated to the ultimate disposal of that waste.

Characterization would need to be sampled and testing completed to ensure proper disposal, which often includes Toxicity Characteristic Leaching Procedure (40 CFR 261.24).

Upon completion of the waste characterization, the proper disposal method(s) (e.g., landfill, solidification, oil/water separator) would need to be identified. Numerous disposal facilities would likely need to be utilized due to the volume of waste generated, and the selected disposal facilities would need to be audited prior to transporting the waste, particularly if it is a special waste or hazardous waste to mitigate risks. If the material can be recycled (e.g., concrete), a recycling company would need to be identified and audited.

Some waste streams would possibly require treatment prior to or once at the landfill, especially if any liquid waste is generated.

Transportation considerations such as the mode of transporting each waste (e.g., rail, truck) would need to be identified. This would include provisions for truck entry onto the site to pick up the material; oversite by personnel to provide appropriate documentation; appropriate required training for personnel that would be signing a hazardous waste manifest; and necessary placards or labels for the trucks that would be carrying hazardous waste.

The pipeline would be abandoned and removed from service; therefore, no impacts from hazardous waste during operation of the pipeline under Lake Oahe would occur.

In conclusion, removal activities for abandonment of the pipeline associated with Alternative 1 would not result in significant impacts from hazardous waste.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 are also likely to include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

3.10.3.2. Alternative 2

Alternative 2 would result in a minor amount of solid waste being generated during construction including hazardous wastes, non-hazardous wastes, special wastes, and universal wastes from construction and surface disturbance activities. These activities would have temporary to short-term impacts dependent on volume of waste generated and how quickly the waste is characterized, profiled, and transported to the disposal facility. This alternative would have a minor impact due to the less complex nature of managing minor volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste.

Solid waste management considerations would include the generation of the following potential waste streams (this list may not be all inclusive, and other waste streams could be generated):

- Demolition concrete wastes
- Petroleum-impacted soils from releases
- Petroleum-impacted waters from releases
- Release-absorbent material, if used

The waste streams being generated would need to be appropriately characterized, managed, and disposed of in accordance with local, tribal, state, and federal solid and hazardous waste regulations at a minimum with 40 CFR 261 as described in Alternative 1.

The pipeline would be abandoned in place and removed from service; therefore, no impacts from hazardous waste during operations of a pipeline under Lake Oahe would occur.

In conclusion, as a result of the effects identified above, construction activities associated with Alternative 2 would not result in significant impacts from hazardous waste.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. Direct and indirect impacts from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, along with the combined impacts of Alternative 2 and 5 are described under Alternative 5, below.

3.10.3.3. Alternative 3

Under Alternative 3, there would be no construction activity; therefore, there would be no construction-related hazardous waste impacts.

If the requested easement were granted with the same conditions as the vacated easement (Appendix D), the required actions that would preemptively mitigate hazardous materials or hazardous waste would also mitigate petroleum-impacted soils and petroleum-impacted water. Any solid waste would be managed in accordance with applicable local, tribal, state, and federal regulations. If a WCD release were to occur, soils and water would be impacted by hazardous waste. These impacts are further addressed in Section 3.2, Geology and Soils, and Section 3.3, Water Resources. Efforts would be required to remediate the contaminated area, which would occur from months to years depending on the size of a release. A crude oil release would result in a minor to major hazardous waste impact due to the need for managing waste within regulatory requirements. However, based on the likelihood (remote to very unlikely depending on the scenario considered), a WCD crude oil release would present a minor to moderate risk from hazardous waste.

In conclusion, hazardous waste impacts associated with Alternative 3 are not expected to be significant.

3.10.3.4. Alternative 4

Alternative 4 would not cause any surface disturbance, and there would be no construction-related hazardous waste impact.

This alternative would also include conditions that require additional monitoring and release response measures beyond those in the original easement that would aid in the identification of any releases of crude oil and response to a release. Any solid waste would be managed in accordance with applicable local, tribal, state, and federal regulations. Therefore, the impacts from a crude oil release during operations would be the same as or less than those discussed for Alternative 3 and present a minor to moderate risk from hazardous waste.

In conclusion, hazardous waste impacts associated with Alternative 4 are not expected to be significant.

3.10.3.5. Alternative 5

Alternative 5 would result in a moderate amount of solid waste being generated during construction of the North Bismarck Reroute including hazardous wastes, non-hazardous wastes, special wastes, and universal wastes from construction and surface disturbance activities. These activities would have temporary to short-term impacts dependent on volume of waste generated and how quickly the waste is characterized, profiled, and transported to the disposal facility. This alternative would have a minor impact due to the less complex nature of managing moderate volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste.

Solid waste management considerations would include the generation of the following potential waste streams (this list may not be all inclusive, and other waste streams could be generated):

- Demolition concrete wastes
- Petroleum-impacted soils from releases

- Petroleum-impacted waters from releases
- Release-absorbent material, if used

All waste streams associated with Alternative 5 would need to be appropriately characterized, managed, and disposed of in accordance with local, tribal, state, and federal solid and hazardous waste regulations at a minimum with 40 CFR 261 as described above.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

The USACE assumes that the about 100 miles of DAPL Project pipeline would be abandoned in place resulting in a moderate amount of solid waste that would be generated from minor earth disturbances for cutting and capping the line in segments as needed. These activities would have temporary to short-term impacts depending on the volume of waste generated and how quickly the waste is characterized, profiled, and transported to the disposal facility. This alternative would have a minor impact due to the less complex nature of managing moderate volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste. Solid waste management considerations would include the generation of the same potential waste streams as listed above.

Rail and truck transportation results in more frequent releases than pipeline transportation, as determined from a study performed by the Fraser Institute (Green and Jackson, 2015), with truck transportation resulting in the highest frequency of release and the highest release volume per billion ton-miles and the largest probability for fires and explosions. Rail tankers also tend to leak more frequently, but at a lower volume, than pipelines. Further, rail tankers have a larger chance of causing a fire or explosion after release, both of which can damage the environment, wildlife, and human lives.

Indirect solid waste impacts from rail or truck transportation include the generation of the following potential waste streams (this list may not be all inclusive, and other waste streams could be generated):

- Petroleum-impacted soils from releases
- Petroleum-impacted waters from releases
- Release-absorbent material, if used
- Fire-impacted materials from fire/explosions

Mobilization of resources to manage the waste from truck or rail crude oil releases (e.g., contain, characterize, dispose) may be more frequent because releases are more likely to occur.

Crude oil releases from rail or truck transportation would require remediation of petroleum contaminated soils or water, which would occur over months to years depending on the size of a release. A crude oil release is more likely to occur during truck or rail transportation than during transportation via pipeline, although it is expected to result in less volume released and would result in minor to major impacts from hazardous waste due to the need for managing waste within remediation activity regulatory requirements.

In conclusion, construction and operational impacts from hazardous waste for Alternative 5 is not expected to be significant.

Alternative 5 results from abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. The combined construction and operational impacts from hazardous waste for Alternatives 5 and 1 or Alternatives 5 and 2 are not expected to be significant.

3.11. Air Quality and Noise

3.11.1. Air Quality

This section discusses regional climate conditions and ambient air quality, as well as activities associated with construction and operation of the Project that could result in emissions that affect air quality.

3.11.1.1. Project Background: Affected Environment and Impacts

Affected Environment

In this document, air quality is defined as a measurement of pollutants in ambient air. Air pollution comes from many different sources, including stationary sources, mobile sources, and naturally occurring sources. The Clean Air Act (CAA) of 1970 requires that states adopt ambient air quality standards (National Ambient Air Quality Standards [NAAQS]). The CAA (42 USC 7401 et seq.) establishes NAAQS, permit requirements for both stationary and mobile sources, and standards for acid deposition and stratospheric ozone protection. The standards have been established 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" (42 USC 7401 et seq.). Secondary air quality standards protect public welfare by promoting ecosystem health and preventing decreased visibility and damage to crops and buildings. Areas meeting the NAAQS are termed attainment areas, and areas not meeting the NAAQS are termed nonattainment areas. If an area was in nonattainment but now attains the standard and has an EPA-approved plan to maintain the standard, it is designated a maintenance area. Areas that have insufficient data to make a determination of attainment/nonattainment are termed unclassified or not designated but are treated as being attainment areas for permitting purposes.

According to the EPA, all of North Dakota was designated as being in attainment or unclassified with respect to the NAAQS in 2016 (EPA, 2021). The Bismarck Air Quality Monitoring Station in Burleigh County located approximately 23 miles north-northwest of the Lake Oahe crossing was used to estimate air quality in the vicinity of the Proposed Action. The Bismarck Air Quality Monitoring Station measured sulfur dioxide, NO_2, particulate matter, ground-level ozone, and meteorological data (North Dakota Department of Health, 2013 as cited in USACE, 2016).

Monitoring data for this station from 2003 to 2013 showed pollutant levels for sulfur dioxide, NO_2, ozone, and particulate matter did not exceed state or federal ambient air quality standards at any of the state-operated monitoring sites (North Dakota Department of Health, 2013 as cited in USACE, 2016).

Impacts to Date

Construction

Construction of the pipeline resulted in temporary impacts on air quality. During construction, emissions from fuel-burning internal combustion engines (e.g., transportation trucks, heavy equipment, drill rigs), vehicle travel to and from the Project site to deliver equipment and workers, and fugitive dust from earth-disturbing activities temporarily increased the levels of some criteria pollutants, including carbon monoxide (CO), NO_2, ozone, particulate matter, including particulate matter less than 10 microns (PM_{10}), and particulate matter less than 2.5 microns ($PM_{2.5}$), and non-criteria pollutants, such as VOCs and HAPs. Construction of the Lake Oahe crossing occurred over the course of 16 weeks from December 2016 to March 2017, with active drilling occurring for 64 days. Table 3.11.1-1 provides an estimate of construction emissions associated with pipeline construction for the Lake Oahe crossing. Emission calculation details are provided in Appendix I.

Table 3.11.1-1: Estimated Construction Emissions

Construction Activity	NOx (tons)	CO (tons)	VOCs (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	SO_2 (tons)	HAPs (tons)	CO_2e (tons)
On-road Vehicles [a]	1.7	1.6	0.1	< 0.1	< 0.1	< 0.1	< 0.1	548
Off-road Vehicles	2.2	1.0	0.1	0.2	0.2	< 0.1	0.1	1,049
Construction Equipment	22.3	7.8	1.4	1.1	1.1	< 0.1	1.5	4,987
Construction Activity Fugitive Dust	--	--	--	15.6	1.8	--	--	--
Total	**26.2**	**10.4**	**1.6**	**16.9**	**3.1**	**< 0.1**	**1.6**	**6,584**

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; HAP = hazardous air pollutant; NOx = nitrogen oxides; PM_{10} = particulate matter less than 10 microns; $PM_{2.5}$ = particulate matter less than 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound; -- = not generated
The numbers in this table have been rounded for presentation purposes and the sum may not reflect the total of addends.
[a] On-road vehicles include employee and support vehicle traffic from the construction site.

To reduce the emission of criteria pollutants during construction, Dakota Access kept fuel-burning equipment running times to a minimum and engines were properly maintained. This temporary increase in criteria pollutant emissions and HAPs resulted in a minor, temporary impact on air quality in the Project vicinity. Based on dispersion, construction air emission impacts are typically highly localized and would not travel more than 0.5 mile from the construction area. Therefore, the air emissions associated with construction of the Project did not impact air quality or visibility in the region.

Operation

Normal pipeline operations across Lake Oahe does not generate any direct emissions of criteria air pollutants. A minor amount of emissions is associated with pipeline maintenance activities, which include vehicle travel to and from the Project Area; depending on the nature of the maintenance activity, this could also include non-road and on-road gas and diesel equipment. Therefore, pipeline operation has had a negligible impact on air quality in the Project vicinity.

3.11.1.2. Current Affected Environment

According to the EPA, all of North Dakota continues to be designated as in attainment or unclassified with respect to the NAAQS. No substantial changes to air quality have occurred in the Project Area between 2016 and today (EPA, 2021).

3.11.1.3. Impacts and Mitigation

This section describes the air quality impacts and mitigation associated with the five alternatives, including the risk of a crude oil release and associated air quality impacts.

Alternative 1

Alternative 1 involves restoration of the Project Area to pre-pipeline conditions and would include removal of the pipeline. Implementation of Alternative 1 would result in the long-term generation of construction emissions. Construction activities to remove the pipeline would occur between 6 and 20 plus years and require the amount of workspace similar to the construction of 120 miles of the DAPL Project. Based on the amount of work required, including site preparation, excavation that may include dredging, spoil storage and disposal, and restoration, the amount of direct construction emissions associated with Alternative 1 would be considerably larger than the emissions associated with the original Project pipeline construction shown in Table 3.11.1-1.

Because the pipeline would be abandoned, there would be no ongoing operational emissions associated with Alternative 1. The abandonment of the pipeline would have minor air quality benefits to the Project Area by eliminating the operational emissions associated with pipeline maintenance; however, because these emissions result in negligible air quality impacts, the benefits would also be negligible.

In conclusion, the increase in criteria pollutant emissions and HAPs during removal of the pipeline would result in a long-term, moderate impact on air quality in the Project vicinity, would not impact air quality or visibility in the region, and would not result in a significant impact.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 would involve purging the Project pipeline of oil, capping it, and abandoning it in place. Implementation of Alternative 2 would result in the temporary generation of construction emissions. Because Alternative 2 would require very little ground disturbance and minimal construction activities, the amount of construction emissions associated with Alternative 2 would be smaller than the emissions associated with the original pipeline construction shown in Table 3.11.1-1.

Because the pipeline would be abandoned, there would be no ongoing operational emissions associated with Alternative 2. The abandonment of the pipeline would have minor air quality benefits to the Project Area by eliminating the operational emissions associated with pipeline maintenance; however, because these emissions result in negligible air quality impacts, the benefits would also be negligible.

In conclusion, the temporary increase in criteria pollutant emissions and HAPs from construction would result in a negligible, temporary impact on air quality in the Project vicinity, would not impact air quality or visibility in the region, and would not result in a significant impact.

Similar to Alternative 1, Alternative 2 would likely result in the construction and operation of a pipeline reroute such as the North Bismarck Reroute. Direct and indirect impacts from the reroute, along with the combined impacts of Alternatives 2 and 5, are described under Alternative 5, below.

Alternative 3

Alternative 3 would involve the USACE granting an easement for the pipeline across its federal lands and Lake Oahe with the same conditions from the original authorization. Because the pipeline construction has already occurred, Alternative 3 would result in no new construction emissions.

Normal pipeline operations would not generate any direct emissions of criteria air pollutants; a minor amount of emissions would be associated with pipeline maintenance activities.

In the event of a crude oil release from the pipeline, air emissions would occur associated with the vaporization of the crude oil and cleanup activities. Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, describes WCD crude oil release scenarios. Release scenarios with the greatest surface air oil exposure would likely result in the greatest GHG impacts because they would require the greatest response and cleanup effort. Modeling results indicate that surface oil exposure would occur intermittently, up to 50 miles downstream for unmitigated release scenarios. The larger exposure surface area of the oil release would result in the greatest potential for crude oil vaporization, resulting in VOC and HAP emissions. Both ice-free and ice-covered release scenarios were considered, and the ice-free scenarios would result in the oil traveling the farthest distance. Crude oil release response and cleanup activities would require the use of non-road and on-road gas and diesel equipment, similar to pipeline construction. Air emissions would cease upon the completion of cleanup activities. The air emissions associated with a crude oil release would result in a minor, temporary impact on air quality in the Project vicinity. These impacts combined with the likelihood of remote to very unlikely for these WCD release scenarios result in an overall risk of negligible and would not be significant.

In conclusion, pipeline operation associated with Alternative 3 would have a temporary, negligible impact on air quality in the Project vicinity that would not be significant.

Alternative 4

Alternative 4 would involve the USACE granting an easement for the pipeline across its federal lands and Lake Oahe but with additional conditions. Because the pipeline construction has already occurred and those air impacts were minor and temporary, no additional conditions associated with air quality are proposed under Alternative 4. Alternative 4 would result in no new construction emissions.

Normal pipeline operations would not generate any direct emissions of criteria air pollutants; a minor amount of emissions would be associated with pipeline maintenance activities. Additional easement conditions for improved response times and earlier detection of a release would further reduce the risk of a large crude oil release and the associated minor, temporary impacts on air quality in the Project vicinity as a result of cleanup activities (see the discussion above for Alternative 3). No additional conditions associated with air quality are proposed under Alternative 4.

In conclusion, pipeline operation associated with Alternative 4 would have a temporary, negligible impact on air quality in the Project vicinity that would not be significant.

Alternative 5

Similar to the existing about 100-mile-long route, the North Bismarck Reroute would be located in an area in attainment or unclassified with respect to the NAAQS in 2016 (EPA, 2021) (see Section 3.11.1.1 above). Emissions would be generated during construction of the 111-mile pipeline reroute, including non-road and on-road gasoline and diesel emissions and fugitive dust from earth-disturbing activities. Table 3.11.1-2 presents an estimate of construction emissions associated with construction of a pipeline of similar length.[58] This short-term increase in criteria pollutant emissions and HAPs would result in a short-term, minor impact on air quality in the Project vicinity and would not impact air quality or visibility in the region.

Table 3.11.1-2: Estimated Construction Emissions: North Bismarck Reroute

Construction Activity	NOx (tons)	CO (tons)	VOCs (tons)	PM_{10} (tons)	$PM_{2.5}$ (tons)	SO_2 (tons)	HAPs (tons)	CO_2e (tons)
Pipeline Construction	32.1	25.2	3.4	253.4	35.7	0.1	1.8	867

Source: FERC, 2020

CO = carbon monoxide; CO_2e = carbon dioxide equivalent; HAP = hazardous air pollutant; Nox = nitrogen oxides; PM_{10} = particulate matter less than 10 microns; $PM_{2.5}$ = particulate matter less than 2.5 microns; SO_2 = sulfur dioxide; VOC = volatile organic compound

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

The pipeline abandonment process would generate additional construction emissions, including non-road and on-road gasoline and diesel emissions and fugitive dust from earth-disturbing activities. Because abandonment would involve very little ground disturbance and minimal construction activities, the amount of construction emissions associated with pipeline abandonment would be smaller than the emissions associated with the original pipeline construction shown in Table 3.11.1-1, resulting in temporary, minor impacts.

Truck and rail transport would be conducted to and from the Bakken Oil Express Terminal in Dickinson, North Dakota, and the Great Northern Midstream Terminal in Fryburg, North Dakota, during permitting and construction of the North Bismarck Reroute. Truck and rail transport would result in no new construction emissions because existing infrastructure would be used. If rail transport were used to carry a

[58] Construction emissions were estimated using the estimated construction emissions associated with the Tioga-Elkhorn Creek Pipeline, which is a 24-inch-diameter, 62.8-mile, natural gas pipeline proposed as part of WBI Energy Transmission, Inc.'s North Bakken Expansion Project (FERC, 2020). The construction emissions for the Tioga-Elkhorn Creek Pipeline were obtained from the Federal Energy Regulatory Commission's Environmental Assessment prepared for the project dated December 2020. The Tioga-Elkhorn Creek Pipeline was chosen due to its geographical proximity to the Project, as well as the similar pipeline length and diameter, and similar scope of the pipeline installation. The estimated construction emissions for construction of each mile of the Tioga-Elkhorn Creek Pipeline were calculated, and that estimate was scaled up to the 111-mile length of the North Bismarck Reroute.

comparable volume of oil as the pipeline, approximately 3.5 loaded crude oil trains (100 cars each) would pass through Morton County each day to and from the Bakken Oil Express and Great Northern Midstream terminals. Rail transport of crude oil would generate air emissions, including greenhouse gases, associated with the operation of the crude oil trains, which are typically diesel-fired engines. A 2017 report titled *The External Costs of Transporting Petroleum Products by Pipelines and Rail: Evidence from Shipments of Crude Oil from North Dakota* comparing pipeline with rail transport of crude oil estimated that rail transport of crude oil generates greater operational NO_x, $PM_{2.5}$, and VOC emissions than use of a pipa compeline per mile transported (Clay et al., 2017) but found that pipeline transport may generate greater SO_x emissions per mile transported. GHG emissions associated with Alternative 5 are addressed in Section 3.12.3.7, [Climate Change, Impacts and Mitigation] GHG Emissions Associated with Crude Oil Production and Consumption.

Table 3.11.1-3 provides an estimate of emissions per million barrel mile to transport crude oil via pipeline or rail to the Gulf Coast (Clay et al. 2017). The 2017 report was based on emissions information from 2011, therefore, it does not reflect the smaller air emission footprints from power plants that provide power for pipeline operations and likely overestimates emissions from pipeline operations. The USACE was not able to find a comparable report with more recent air emission information; therefore, this report has been used to conservatively allow for a comparison between the two transportation options.

Table 3.11.1-3: Estimated Emission Comparison: Pipeline versus Rail

Pollutant	Pipeline – Gulf Coast	Rail – Gulf Coast
	Emission (tons) per million barrel miles	Emission (tons) per million barrel miles
NO_X	0.005	0.061
SO_X	0.009	0.001
$PM_{2.5}$	0.001	0.002
VOC	Not available	0.003

Source: Clay et al., 2017

NOx = nitrogen oxides; $PM_{2.5}$ = particulate matter less than 2.5 microns; SOx = sulfur oxides; VOC = volatile organic compound

Because sufficient facilities do not exist to transport the entire DAPL Project volumes, including the Optimization Project, via rail, the use of truck transport would also be required. If truck transport were used to carry a comparable volume of oil as the pipeline, approximately 5,000 full tanker trucks would need to depart from the Bakken Oil Express and Great Northern Midstream terminals each day. The trucks would travel variable distances depending on the delivery destination, up to 1,500 miles one way to travel from the Bakken region to the Gulf Coast. Truck transport of crude oil would generate air emissions associated with the operation of the tanker trucks, which are typically diesel-fired engines, with the amount of air emissions generated depending on the amount of oil transported by truck factoring in the availability and cost of this mode of transport. Comparable emission comparisons of pipeline versus truck, as compared to pipeline versus rail, were not available; however, in general truck transport would generate a higher volume of operational emissions as compared to rail transport (Barth and Tadi, 1996). Due to the lack of existing rail facilities to transport the oil delivered by the Project, truck and rail transport combined would generate greater criteria pollutant emissions and GHG emissions as compared with pipeline transport. The air emissions that would be generated by rail or truck transport would depend on the volume of oil that would be transported, which is uncertain to be the same as would be transported by pipeline due the availability and cost of those modes of transportation. However, because the emissions would be spread over large distances, the short-term increase in criteria pollutant emissions and HAPs associated with truck or rail transport of crude oil at any given location would result in a short-term, minor impact on air quality, and would not impact air quality or visibility in the region. In the event of a crude oil release, air emissions would occur associated with the vaporization of the crude oil and cleanup activities and impacts would be similar to those discussed above in Alternatives 3 and 4.

In conclusion, construction and operational impacts on air quality for Alternative 5 would result in both temporary and short-term, minor impacts on air quality and would not be significant.

Because the DAPL Project has been constructed, implementation of Alternative 5 would require the abandonment of the Lake Oahe crossing (under Alternative 1 or Alternative 2). Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Based on the preceding assessments, the combined construction and operational impacts on air quality for Alternatives 5 and 1 would not be significant. The combined construction and operational impacts on air quality for Alternatives 5 and 2 would also not be significant.

3.11.2. Noise

This section defines noise, describes how it propagates through air, describes the existing noise conditions within the Project Area, and identifies potential noise impacts associated with construction and operation of the Project.

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

Decibels 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 dBA (see Table 3.11.2-1). 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.

Because noise levels can vary over a given time period, they are evaluated using various descriptors. The descriptors used in this analysis are the equivalent sound level (L_{eq}), which is an average of the time-varying sound energy for a specified period, and the day-night sound level (L_{dn}), which is an average of the time-varying sound energy for one 24-hour period, with a 10-decibel addition to the sound energy for the time between 10 p.m. and 7 a.m. to account for increased noise sensitivity during nighttime hours.

Table 3.11.2-1: 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 as cited in USACE, 2016

dBA = decibels of the A-weighted scale; L_{dn} = day-night average sound level; L_{eq} (24) = 24-hour equivalent sound level

For the purpose of this analysis, noise sensitive areas (NSAs) are defined as areas where elevated noise would interfere with normal activities associated with its use. Examples of NSAs include residences, schools and daycare facilities, hospitals, and places of worship.

3.11.2.1. Project Background: Affected Environment and Impacts

Affected Environment

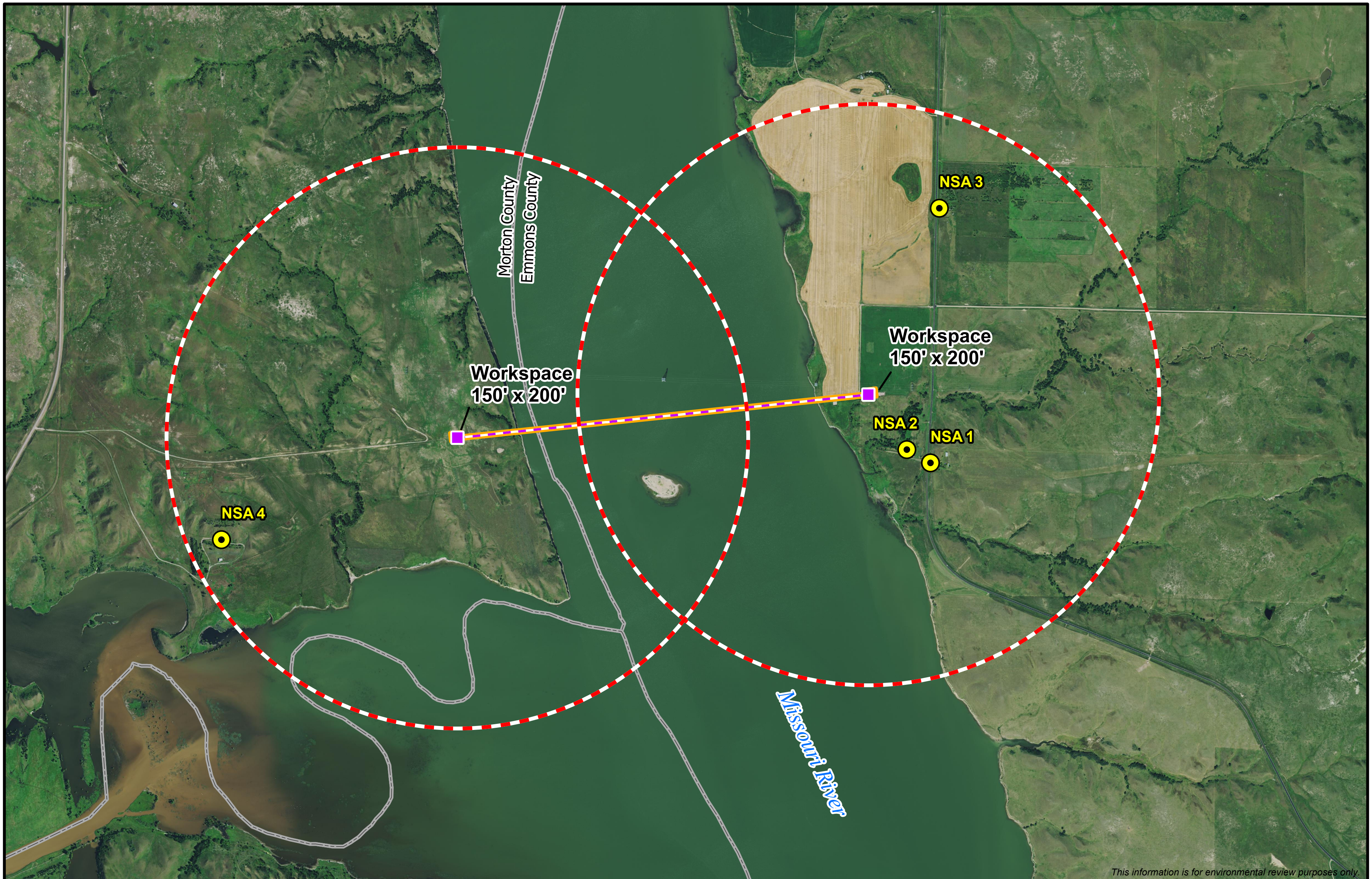
At the time of construction, the Project crossed through agricultural land and open space. A typical L_{dn} for agricultural cropland is 44 dBA, and a typical L_{dn} for rural residential areas is 39 dBA (The Engineering ToolBox, 2015 as cited in USACE, 2016).

Four NSAs were located within 1 mile of the HDD entry and exit locations. The NSAs and their distance and direction from the HDD noise areas are identified in Table 3.11.2-2. The locations of these NSAs are identified on Figure 3.11.2-1.

Table 3.11.2-2: NSAs within 1 Mile of HDD Entry and Exit Locations

NSA Identification	NSA Type	Distance and Direction from Project
NSA 1	Residence	1,530 feet southeast of eastern HDD site
NSA 2	Residence	1,060 feet southeast of eastern HDD site
NSA 3	Residence	3,480 feet northeast of eastern HDD site
NSA 4	Structure (potential residence)	4,440 feet southwest of western HDD site

HDD = horizontal directional drill; NSA = noise sensitive area



Potential Noise Sensitive Area
HDD Entry Exit
HDD Alignment
Workspaces
1 Mile Buffer
County Boundary

1:30,000
0 1,000 2,000 Feet

Figure 3.11.2-1: Noise Sensitive Areas near the Lake Oahe Crossing
Dakota Access Pipeline Lake Oahe Crossing Project
Morton County and
Emmons County, North Dakota

ERM

REVISED: 01/21/2022 | SCALE: 1:30,000

Impacts to Date

Construction

Construction of the Project temporarily affected noise levels on and around the HDD entry points, causing temporary increases in the ambient sound environment in the areas immediately surrounding active construction. Because the HDD intersect method was used, an HDD entrance site was located on each side of the Lake Oahe crossing. The use of heavy equipment or trucks were the primary noise source during construction and excavation. The level of impact varied by equipment type, duration of construction activity, and the distance between the noise source and the receptor. Because construction activities were typically limited only to daytime hours, the majority of the noise impacts occurred during the daytime.

Some HDD activities involved continuous construction that included nighttime work over 4 months; therefore, NSAs in proximity to HDD entry sites experienced elevated sound levels during the HDD portions of the Lake Oahe crossing. This EIS evaluates the potential noise impacts associated with HDD activities at the NSAs within 1 mile of HDD entry points using typical sound levels for HDD activities from previously completed noise studies (Burge and Kiteck, 2009). The estimated noise contribution from HDD activities at the nearby NSAs was based on logarithmic distance attenuation and included atmospheric absorption. This methodology is conservative as other factors that may further attenuate noise levels, such as vegetative cover and ground absorption, were not included in the estimates.

The estimated L_{dn} at the nearby NSAs associated with HDD activities is presented in Table 3.11.2-3. Noise calculations in support of these estimates are included in Appendix J.

Table 3.11.2-3: Estimated Noise from HDD Activities at NSAs

NSA Identification	Distance and Direction from Project	Estimated Noise from HDD Activities at 50 feet (dBA L_{eq}) [a]	Estimated Noise Contribution from HDD Activities at NSA (dBA L_{dn})
NSA 1	1,530 feet southeast of HDD entry site	83	56.2
NSA 2	1,060 feet southeast of HDD entry site	83	60.4
NSA 3	3,480 feet northeast of HDD entry site	83	45.5
NSA 4	4,440 feet southwest of HDD exit site	83	41.8

[a] Burge and Kiteck, 2009

dBA = A-weighted decibel; HDD = horizontal directional drill; L_{dn} = day-night average sound level; L_{eq} = equivalent sound level; NSA = noise sensitive area

Based on estimated noise associated with HDD activities and the estimated background sound levels, the noise associated with HDD activities was likely perceptible at all four of the nearby NSAs and may have exceeded 55 dBA L_{dn} at NSA 1 and 2.

Dakota Access mitigated noise impacts by limiting equipment running times. Noisy construction activities were typically limited to the least noise-sensitive times of day (daytime only), with the exception of some HDD activities that required continuous activity. All construction noise ceased upon the completion of construction. Therefore, noise-associated HDD activities resulted in a temporary, minor to moderate impact at nearby NSAs, which was not significant.

Operation

There are no aboveground facilities associated with the Project, and normal pipeline operations are not audible at the ground surface. Pipeline maintenance activities may have resulted in some temporary noise during operation, such as vehicle trips to the Project Area; however, depending on the type of maintenance being completed, the noise impacts may be either minimal (such as vehicle traffic noise) or similar to those described for construction in the event of pipeline repair work or response to a crude oil release, but shorter in duration and likely limited to daytime only work. Therefore, impacts associated with normal pipeline operations have been negligible, and impacts associated with planned or unplanned maintenance were temporary and may have varied in intensity from negligible to minor. Overall, operating noise impacts to date have not been significant.

3.11.2.2. Current Affected Environment

There have been no significant changes to land use in the Project Area since the pipeline was constructed, and no new NSAs were identified in proximity to the Project Area. No notable changes to ambient sound levels have occurred in the Project Area between 2016 and the time of this document publication.

3.11.2.3. Impacts and Mitigation

This section describes the noise impacts and mitigation associated with Alternatives 1 through 4, including the risk of a crude oil release and associated noise impacts.

Alternative 1

Alternative 1 would involve restoration of federal lands to pre-pipeline conditions and would include removal of the pipeline. Implementation of Alternative 1 would cause temporary increases in ambient sound levels in the area immediately surrounding construction activities. Based on the amount of work required, including site preparation, excavation that may include dredging, spoil storage and disposal, and restoration, the amount of construction noise associated with Alternative 1 would likely be similar in scale to the sound levels associated with the original pipeline HDD installation shown in Table 3.11.2-3; however, because the construction period would last 6 to 20 plus years, the impacts on any of the nearby NSAs would be longer in duration than the original pipeline HDD installation, although the noise would likely be limited to daytime hours. This increase in ambient noise would result in a long-term, minor impact on sound levels in the Project vicinity.

Because the pipeline would be abandoned by removal, there would be no direct ongoing operational noise associated with Alternative 1.

In conclusion, the long-term increase in noise from pipeline removal under Alternative 1 would not result in a significant impact.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Alternative 2

Alternative 2 would involve purging the pipeline of oil, capping it, and abandoning it in place. Implementation of Alternative 2 would cause temporary increases in ambient sound levels in the area immediately surrounding construction activities. Because Alternative 2 would require very little ground disturbance and minimal construction activities, the amount of construction noise associated with Alternative 2 would likely be much less than the sound levels associated with the original pipeline HDD installation shown in Table 3.11.2-3. This temporary increase in ambient noise would result in a negligible, temporary impact on sound levels in the Project vicinity, which would not be significant.

Because the pipeline would be abandoned in place, there would be no ongoing operational noise associated with Alternative 2.

In conclusion, the temporary increase in noise from construction of Alternative 2 would not result in a significant impact.

Similar to Alternative 1, Alternative 2 would likely result in the construction and operation of a pipeline reroute such as the North Bismarck Reroute. Direct and indirect impacts from the reroute, along with the combined impacts of Alternatives 2 and 5, are described under Alternative 5, below.

Alternative 3

Alternative 3 would involve the USACE granting an easement for the pipeline across its federal lands and to cross Lake Oahe without additional easement conditions. Because the pipeline construction has already occurred, Alternative 3 would result in no new construction noise.

There are no aboveground facilities associated with the Project, and normal pipeline operations would not be audible at the ground surface. Pipeline maintenance activities would result in some temporary noise during operation. Depending on the type of maintenance being completed, the noise impacts may be either minimal (such as vehicle traffic noise) or similar to those described for construction in the event of pipeline repair work or response to a crude oil release, but shorter in duration. Therefore, impacts associated with normal pipeline operations for Alternative 3 would be negligible, and impacts associated with planned or unplanned maintenance would be temporary and negligible to minor.

In the event of a crude oil release from the pipeline, noise would be generated associated with the oil cleanup activities. Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, describes potential crude oil release scenarios. Release scenarios with the greatest surface air oil exposure would likely result in the greatest noise impacts. The larger exposure surface area of the oil release would result in a longer-term cleanup activity, which would generate noise for a longer time period compared to the other crude oil release scenarios. Both ice-free and ice-covered release scenarios were considered, and the ice-free scenarios would result in the oil traveling the farthest distance. Crude oil release response and cleanup activities would require the use of non-road and on-road gas and diesel equipment, which would generate noise similar to pipeline construction. The noise impacts associated with a crude oil release would result in minor, temporary noise impacts in the Project vicinity.

In conclusion, operational noise impacts for Alternative 3 would not be significant.

Alternative 4

Alternative 4 would involve the USACE granting an easement for the pipeline across its federal lands and to cross Lake Oahe with additional conditions. Because the pipeline construction has already occurred, Alternative 4 would result in no construction noise.

Because operating noise impacts would be negligible to minor, no additional conditions are proposed. Additional easement conditions for improved response times and earlier detection of a release would further reduce the risk of a large crude oil release and the associated minor, temporary noise impacts on air quality in the Project vicinity as a result of cleanup activities (see the discussion above for Alternative 3).

In conclusion, operational noise impacts for Alternative 4 would not be significant.

Alternative 5

The North Bismarck Reroute would require the construction of approximately 111 miles of additional pipeline, which would result in temporary construction noise impacts. Noise levels associated with pipeline construction would be similar in scale to the noise levels presented in Table 3.11.2-3; however, the sound levels would be transient and not concentrated in one area for a long period of time. This temporary increase in ambient noise would result in a minor, temporary impact on sound levels in the Project vicinity. The North Bismarck Reroute would result in no new operational noise impacts.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

The noise associated with abandoning the pipeline would result in temporary impacts on NSAs in proximity to the pipeline crossing. Pipeline abandonment would require very little ground disturbance and minimal construction activities; the amount of construction noise associated with pipeline abandonment would likely be much less than the sound levels shown in Table 3.11.2-3. This temporary increase in ambient noise would result in a negligible, temporary impact on sound levels in the Project vicinity.

Truck and rail transport would be conducted to and from the Bakken Oil Express Terminal in Dickinson, North Dakota, and the Great Northern Midstream Terminal in Fryburg, North Dakota, during construction of the North Bismarck Reroute. If rail transport were used to carry a comparable volume of oil as the pipeline, approximately 3.5 loaded crude oil trains (100 cars each) would pass through Morton County each day to and from the Bakken Oil Express and Great Northern Midstream terminals. Rail transport of crude oil would generate additional noise impacts along an existing rail corridor.

If truck transport were used to carry a comparable volume of oil as the pipeline, approximately 5,000 full tanker trucks would need to depart from the Bakken Oil Express and Great Northern Midstream terminals each day. Truck transport would generate additional noise impacts along existing transportation corridors. The noise impacts that would be generated by rail or truck transport would depend on the volume of oil that would be transported; however, both truck and rail transport alternatives would generate greater operational noise impacts as compared to pipeline transportation. Because the noise would be generated along existing transportation corridors and would be spread over large distances, the short-term noise increase associated with truck or rail transport of crude oil would result in a short-term, minor impact on noise in the Project vicinity.

In the event of a crude oil release from Alternative 5, noise would be generated associated with the oil cleanup activities and impacts would be similar to those discussed above in Alternatives 3 and 4. In conclusion, construction and operational noise impacts for Alternative 5 would not be significant.

Because the Project has been constructed, implementation of Alternative 5 would require the abandonment of the existing Lake Oahe crossing (under Alternative 1 or 2); therefore, Alternative 5 also results in the implementation of Alternatives 1 or 2). Therefore, impacts associated with Alternative 5 also include the abandonment activities discussed under Alternative 1 or Alternative 2 above, and impact determinations are inclusive of constructing and operating the North Bismarck Reroute and abandoning the existing pipeline. Based on the preceding assessments, the combined construction and operation noise impacts for Alternatives 5 and 1 or Alternatives 5 and 2 would not be significant.

3.12. CLIMATE CHANGE

This section defines climate change, describes the impacts it is having and is predicted to have in the Project Area, describes the potential effects of Project construction and operations on climate change, and describes the potential effects of climate change on the Project facilities.

3.12.1. Climate Change Background

Climate change is the variation in climate (e.g., temperature, precipitation, humidity, wind) over time, whether due to natural variability, human activities, or a combination of both, and cannot be characterized by an individual event or anomalous weather pattern. While one individual extreme weather event in a particular region is not a certain indication of climate change, a series of severe events that statistically alter weather patterns over decades may indicate climate change. Recent research has begun to attribute certain extreme weather events to climate change (USGCRP, 2018).

The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP), composed of representatives from 13 federal departments and agencies.[59] The Global Change Research Act of 1990 requires the USGCRP to submit a report to the U.S. President and Congress no less than every 4 years that:

> "1) integrates, evaluates, and interprets the findings of the Program; 2) analyzes the effects of global change on the natural environment, agriculture, energy production and use, land and water resources, transportation, human health and welfare, human social systems, and biological diversity; and 3) analyzes current trends in global change, both human induced and natural, and projects major trends for the subsequent 25 to 100 years."

These reports describe the current state of the science relating to climate change and the effects of climate change on different regions of the United States and various societal and environmental sectors, such as water resources, agriculture, energy use, and human health.

In 2017 and 2018, the USGCRP issued its Climate Science Special Report: Fourth National Climate Assessment, Volumes I and II (Fourth Assessment Report) (USGCRP, 2017 and 2018, respectively). The Fourth Assessment Report states that climate change has resulted in a wide range of impacts across every region of the country. Those impacts extend beyond atmospheric climate change and include changes to water resources, transportation, agriculture, ecosystems, and human health. The United States and the world are warming; the global sea level is rising and acidifying; and certain weather events are becoming more frequent and more severe. These changes are driven by accumulation of GHG in the atmosphere through combustion of fossil fuels (coal, petroleum, and natural gas), combined with agriculture, clearing of forests, and other natural sources. These impacts have accelerated throughout the end of the 20th and into the 21st century (USGCRP, 2018).

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[59] The 13 USGCRP member agencies are the Department of Agriculture, Department of Commerce, Department of Defense, Department of Energy, Department of Health and Human Services, Department of the Interior, Department of State, Department of Transportation, Environmental Protection Agency, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and U.S. Agency for International Development.

The EPA identified GHGs as pollutants in the context of climate change. GHG emissions do not cause local impacts, but it is the combined concentration of all GHG emissions in the atmosphere that causes global climate change. These are global impacts that result in localized climate change impacts. Thus, the geographic scope for cumulative analysis of GHG emissions is global rather than local or regional; however, the impacts may differ by project location.

Since the Project was constructed, there have been a series of recent administrative changes that may affect GHG emissions and efforts to mitigate climate change in the United States. On January 20, 2021, President Biden issued EO 13990 on *Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis* (86 Fed. Reg. 7037). On January 27, 2021, President Biden issued EO 14008 on *Tackling the Climate Crisis at Home and Abroad* (86 Fed. Reg. 7619). Among other objectives, the EOs call for a net-zero emission economy and a carbon-free electricity sector. In addition, on January 20, 2021, President Biden announced that the United States will rejoin the Paris Climate Agreement (Agreement), enabling the United States to be a party to the Agreement on February 19, 2021. The Agreement is a binding international agreement to reduce GHG emissions and impacts on climate change that was signed by 196 parties on December 12, 2015, and entered into force on November 4, 2016. The Agreement aims to limit global warming to well below 2 degrees Celsius, and preferably to 1.5 degrees Celsius, compared with pre-industrial levels (UNFCCC, 2015a). Prior to the U.S. withdrawal from the Agreement in November 2020, the United States initially proposed a 26 to 28 percent domestic reduction in GHG by 2025 compared with 2005 (UNFCCC, 2015b). In April 2021, the United States set a target of 50 to 52 percent domestic reduction in GHG by 2030 compared with 2005 (The White House, 2021).

3.12.2. Affected Environment

Climate change is a global phenomenon; however, this analysis focuses on the existing and potential cumulative climate change impacts in the Project region. The USGCRP's Fourth Assessment Report (the most recent climate assessment report available) notes the following observations of environmental impacts are attributed to climate change in the Northern Great Plains region (USGCRP, 2017 and 2018):

- Major flooding events followed by severe drought as seen in 2011 to 2012; and
- Impacts on agriculture, including increased abundance of weeds and invasive species.

The USGCRP's Fourth Assessment Report notes the following projections of climate change impacts in the Project region with a high or very high level of confidence[60] (USGCRP, 2018):

- Increases in the number of heavy precipitation events (events with greater than 1 inch per day), resulting in more frequent flood events;

[60] The report authors assessed current scientific understanding of climate change based on available scientific literature. Each "Key Finding" listed in the report is accompanied by a confidence statement indicating the consistency of evidence or the consistency of model projections. A high level of confidence results from "moderate evidence (several sources, some consistency, methods vary and/or documentation limited, etc.), medium consensus." A *very* high level of confidence results from "strong evidence (established theory, multiple sources, consistent results, well documented and accepted methods, etc.), high consensus." (USGCRP, 2017)

- Increased probability of very hot days (maximum temperatures above 90 degrees Fahrenheit), with potential impacts on agriculture, energy production, human health, streamflow, snowmelt, and fires; and fewer cool days (minimum temperatures below 28 degrees Fahrenheit), with potential implications for regional snowpack, streamflow, and water use;
- Further impacts on agriculture including increased abundance and competitive ability of weeds and invasive species, increased livestock production due to warmer and wetter conditions, and variable crop yields due to extreme temperature events during critical pollination and grain fill periods;
- Critical energy infrastructure will be vulnerable to extreme weather events and associated flooding/erosion, including railroads and pipelines; and
- Indigenous people will likely see impacts on availability of traditional subsistence and wild foods, wildlife, plants and water for ceremonies, medicines, and health and wellbeing.

The USACE completed an additional analysis of climate change assessment specific to the Missouri River Region and found predicted increases in mean annual air temperature of approximately 4 to 8 degrees Celsius (7 to 14 degrees Fahrenheit) for the Missouri River Region, with variable magnitude by season. The predictions also point to greater annual precipitation, more frequent large storm events, and increases in stream flows; however, considerable variability was noted in the predictions of precipitation and streamflow (USACE, 2015).

While the impacts described above taken individually may be manageable for certain communities, the impacts of compound extreme events (such as simultaneous heat and drought, wildfires associated with hot and dry conditions, or flooding associated with high precipitation on top of saturated soils) can be greater than the sum of the parts (USGCRP, 2018).

3.12.3. Impacts and Mitigation

3.12.3.1. Impacts to Date

As presented in Section 3.11.1, Air Quality, the construction of the pipeline resulted in the short-term generation of GHG emissions. The estimated quantity of GHG emissions generated by construction is presented in Table 3.11.1-1.

Although normal operation of the pipeline across Lake Oahe does not generate any direct GHG emissions, with the exception of minimal GHG emissions associated with periodic pipeline maintenance activities, the oil flowing through the portion of the pipeline within the scope of the Project benefits from hydraulic pressure generated by pumping stations outside the scope of the Project. These pumping stations require power to operate, which in turn generates GHG emissions. However, these pumping stations are outside of the USACE's control, and are required for operation of the entire DAPL Project. Their location and emission source equipment, and thereby resulting emissions, are dictated by factors relating to the entire DAPL Project, not just the Lake Oahe crossing. It is not feasible to determine the portion of emissions from the pumping stations attributable to operation of the Applicant Proposed Action (Lake Oahe crossing). These pumping stations were sited and authorized by state siting authorities and environmental agencies, who are responsible for their ongoing operation and are outside the scope of this EIS.

3.12.3.2. Alternative 1

Alternative 1 would involve removal of the pipeline and restoration of the Project Area to pre-pipeline conditions. Implementation of Alternative 1 would result in the long-term generation of GHG emissions. Construction activities to remove the pipeline would occur between 6 and 20 plus years and require the amount of workspace similar to the construction of 120 miles of the DAPL Project. Based on the amount of work required, including site preparation, excavation that may include dredging, spoil storage and disposal, and restoration, the amount of direct GHG emissions associated with Alternative 1 would likely be considerably larger than the GHG emissions associated with the original pipeline construction shown in Table 3.11.1-1.

Because the pipeline would be abandoned by removal, there would be no direct ongoing operational GHG emissions associated with a pipeline crossing of Lake Oahe. The abandonment by removal of the pipeline would eliminate a small amount of direct operational GHG emissions associated with pipeline maintenance; however, because these emissions are negligible, this change would not result in any changes to climate change impacts associated with the Project.

According to a declaration by Jeff Makholm, Managing Director at National Economic Research Associates, Inc., to the District Court, denying the easement and removing the Project pipeline would likely result in the at least temporary shut-in of between 3,460 and 5,400 wells in the Bakken Region, stranding 320,000 to 500,000 bpd due to unavailable transportation options.[61] However, any associated temporary reduction in GHG emissions from oil production in the region would likely be offset by either a shift of oil production to other areas of the country as the demand for oil would continue or a return of oil to the Bakken Region as additional infrastructure for other transportation options become available (which may also result in increased emissions for higher carbon intensive transportation options such as trucking). Additional discussion regarding GHG emissions associated with production and consumption is provided in Section 3.12.3.7, GHG Emissions Associated with Crude Oil Production and Consumption.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which may result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment by removal of the existing pipeline, which is further discussed under Alternative 5. Therefore, GHG emissions associated with Alternative 1 would be in addition to GHG emissions from constructing and operating the North Bismarck Reroute. See the discussion below for Alternative 5.

3.12.3.3. Alternative 2

Alternative 2 would involve purging the pipeline of oil, capping it, and abandoning it in place. Implementation of Alternative 2 would result in the temporary generation of GHG emissions. Because Alternative 2 would require very little ground disturbance and minimal construction activities, the amount of GHG emissions associated with Alternative 2 would likely be smaller than the emissions associated

[61] Declaration of Jeff Makholm, April 30, 2020, in *Standing Rock Sioux Tribe et al. v. U.S. Army Corps of Engineers, et al*., United States District Court for the District of Columbia, Civil No. 1:16-cv-1534-JEB (and Consolidated Case Nos. 16-cv-01796 and 17-cv-00267).

with the original pipeline construction shown in Table 3.11.1-1 or the construction associated with Alternative 1.

Because the pipeline would be abandoned, there would be no direct ongoing operational GHG emissions associated with Alternative 2. The abandonment of the pipeline would eliminate a small amount of operational GHG emissions associated with pipeline maintenance; however, because these emissions are negligible, this change would not result in any changes to climate change impacts associated with the Project.

As with Alternative 1, denying the easement and abandoning the Project in-place would likely result in the at least temporary shut-in of between 3,460 and 5,400 wells in the Bakken Region, stranding 320,000 to 500,000 bpd due to unavailable transportation options (Makholm Declaration). However, any associated temporary reduction in GHG emissions from oil production in the region would likely be offset by either a shift of oil production to other areas of the country/world as the demand for oil would continue or a return of oil production to the Bakken Region as additional infrastructure for other transportation options become available (which may also result in increased emissions for higher carbon intensive options such as trucking). Additional discussion regarding GHG emissions associated with production and consumption is provided in Section 3.12.3.7.

As described in Alternative 1, under Alternative 2 Dakota Access would likely seek to construct and operate a pipeline reroute. GHG emissions from the North Bismarck Reroute, which this EIS uses as a proxy for a reroute and the associated abandonment of the existing pipeline, if proposed by Dakota Access, are described under Alternative 5, below.

3.12.3.4. Alternative 3

Alternative 3 would involve the USACE granting an easement for the pipeline across its federal lands and Lake Oahe with the same conditions from the original authorization. Because the pipeline construction has already occurred, Alternative 3 would result in no new construction GHG emissions.

Normal operation of the pipeline across Lake Oahe would not generate any direct GHG emissions, with the exception of a minor amount of emissions associated with pipeline maintenance activities (e.g., single vehicle transit to access the Project Area).

In the event of a crude oil release from the pipeline, temporary GHG emissions would occur associated with the oil cleanup activities. Section 3.1.6, [Reliability and Safety] Impacts and Mitigation, describes several crude oil release scenarios. Release scenarios with the greatest surface air oil exposure would likely result in the greatest GHG impacts because they would require the greatest response and cleanup effort. Modeling indicates that surface oil exposure would occur intermittently, up to 50 miles downstream for unmitigated release scenarios. Both ice-free and ice-covered release scenarios were considered, and the ice-free scenarios would result in the oil traveling the farthest distance. Crude oil response and cleanup activities would require the use of non-road and on-road gas and diesel equipment, similar to pipeline construction, which would generate GHG emissions while operating.

3.12.3.5. Alternative 4

Alternative 4 would involve the USACE granting an easement for the pipeline across its federal lands and Lake Oahe but with additional conditions. No additional conditions associated with GHG emissions are proposed under Alternative 4. Alternative 4 would result in no new construction GHG emissions.

Normal operation of the pipeline would not generate any direct GHG emissions, with the exception of a minor amount of emissions associated with pipeline maintenance activities (e.g., single vehicle transit to access the Project Area).

In the event of a crude oil release from the pipeline, GHG emissions would be the same as described under Alternative 3.

3.12.3.6. Alternative 5

The North Bismarck Reroute would require approximately 111 miles of additional pipeline, which would result in additional short-term construction-related GHG emissions from non-road and on-road gasoline and diesel engines. Table 3.11.1-2 presents estimated construction emissions associated with construction of a pipeline of similar length, including GHG emissions.

The State of North Dakota indicated that much of western North Dakota utilizes no-till conservation farming practices. No-till farming practices also result in the added benefit of sequestering carbon each growing season. No-till farming mitigates potential impacts on climate change from cropland agriculture and provides a net benefit. Disturbing soil during construction of the reroute would release sequestered carbon.

In addition to constructing and operating the North Bismarck Reroute, Dakota Access would need to abandon about 100 miles of the DAPL Project that has been constructed to correspond with the start and end points of the North Bismarck Reroute. During the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

The pipeline abandonment process would generate additional temporary construction emissions, including GHG emissions. Because abandonment would involve very little ground disturbance and minimal construction activities, the amount of construction-related GHG emissions associated with pipeline abandonment would be smaller than the emissions associated with the original pipeline construction shown in Table 3.11.1-1.

While permitting and construction of a reroute occurs, Alternative 5 would also likely result in the short-term use of trucking and/or rail to and from the Bakken Oil Express Terminal in Dickinson, North Dakota, and the Great Northern Midstream Terminal in Fryburg, North Dakota, to facilitate transport of the oil that currently passes through the Project pipeline. The number of trains and trucks that would be used as a substitute for the pipeline would be affected by the availability of those modes of transportation and the cost of those modes of transportation as compared to the pipeline, which would affect the amount of oil transported. Additional indirect short-term construction and/or operational GHG emissions would be generated.

If rail transport were used to carry a comparable volume of oil as the pipeline, approximately 3.5 loaded crude oil trains (100 cars each) would pass through Morton County each day to and from the Bakken Oil Express and Great Northern Midstream terminals. Rail transport of crude oil would generate GHG emissions associated with the operation of the crude oil trains, which are typically diesel-fired engines, with the amount of GHG emissions generated depending on the amount of oil transported by rail factoring in the availability and cost of this mode of transport.

If truck transport were used to carry a comparable volume of oil as the pipeline, approximately 5,000 full tanker trucks would need to depart from the Bakken Oil Express and Great Northern Midstream terminals each day. The trucks would travel variable distances depending on the delivery destination, up to 1,500 miles each way to travel from the Bakken Region to the Gulf Coast. Truck transport of crude oil would generate GHG emissions associated with the operation of the tanker trucks, which are typically diesel-fired engines, with the amount of GHG emissions generated depending on the amount of oil transported by truck factoring in the availability and cost of this mode of transport.

Table 3.12.3-1 provides an estimate of annual CO_2 emissions to transport 570,000 bpd or 1,100,000 bpd by train, truck, or pipeline to provide information on the GHG emissions across these modes of transportation. The GHG emissions that would be generated by rail or truck transport would depend on the volume of oil that would be transported, which is uncertain to be the same as would be transported by pipeline due the availability and cost of those modes of transportation.

Table 3.12.3-1: Comparison of GHG Emissions for Pipeline, Rail, and Truck Operations

Flow/Transport Rate (bpd)	Emission Source	Annual Emissions (metric tons CO_2e per year)		
		Pipeline	Rail	Truck
570,000	Energy use [a]	268,884	987,486	4,242,500
	Fugitive and vented emissions [b]	9	24,957	24,957
	Total	**268,893**	**1,012,443**	**4,267,457**
1,100,000	Energy use [a]	518,255	1,905,674	8,187,280
	Fugitive and vented emissions [b]	17	48,163	48,163
	Total	**518,272**	**1,953,837**	**8,235,443**

Source: Dakota Access, LLC., 2022

bpd = barrels per day; CO_2e = carbon dioxide equivalent
[a] Energy use includes electricity generation for pumping stations and emergency generator operations for pipeline emissions and vehicle, tanker truck, and rail operation for rail and truck emissions.
[b] This includes fugitive and vented emissions from pipeline equipment and vented emissions from railcar and tanker truck loading.

The operation of the North Bismarck Reroute would result in no new GHG emissions; however, GHG emissions would be generated by rail and truck transport, as described above.

Because the Project has been constructed, implementation of Alternative 5 would require the abandonment of the Lake Oahe crossing (under Alternative 1 or Alternative 2). Therefore, GHG emissions associated with Alternative 5 would be combined with the GHG emissions from the abandonment activities discussed under Alternative 1 or Alternative 2 above.

Because climate change impacts occur on a global scale, Section 3.12.4, GHG Impact Assessment, discusses climate change impact assessment associated with the GHG emissions of the Applicant Proposed Action.

3.12.3.7. GHG Emissions Associated with Crude Oil Production and Consumption

While not generated directly by the Project, the production of crude oil that is transported by the Project produces GHG emissions. In addition, the refining and ultimate combustion of the refined products or the use of oil as a feedstock for other products would also produce GHG emissions. These actions are not authorized within the scope of the Project but would result in GHG emissions beyond those directly generated by the Project.

To further quantify and assess potential GHG emission sources, the USACE requested additional information from Dakota Access to provide the reasonably foreseeable GHG emissions associated with the production and end use of the crude oil to be transported by the Project, as well as the climate change effects of these activities. In response to the information request, Dakota Access stated it did not believe that an increase in oil production is a reasonably foreseeable result of the Project because if the Project were not operating, other transportation methods would be used to transport oil from the Bakken Region (which is within the Williston Basin), or there would be a pivot to other oil-generating regions. Oil production from other regions might not fully substitute for production in the Bakken Region accounting for economic factors influencing the market for oil as well as domestic and international commitments around decarbonization. The impact of these factors on overall oil consumption and, therefore, downstream GHG emissions is uncertain, as are climate change impacts associated with refining or end use of the quantity of oil transported by the Project because GHG emissions impacts are assessed globally rather than locally or regionally. As noted above, truck transport of crude oil would result in higher GHG emissions to transport the same volume of oil as compared with pipeline transport. Rail transport of crude oil may result in lower GHG emissions than truck transport. Based on the likely combination of the two transportation methods (i.e., truck and rail) and an uncertain reduction in overall production and transportation of oil from the Bakken Region due to the cost and availability of those modes of transportation if the Project were not operating, GHG emissions associated with crude oil production and transportation would likely stay the same or be slightly higher depending on the amount of crude oil transported by truck.

In an effort to further inform the climate change analysis, the USACE estimated GHG emissions associated with refining and end use of the crude oil.

Because the precise end uses are outside the control of Dakota Access and cannot be reasonably predicted, this EIS assumes that all of the crude oil would be refined into gasoline and diesel fuel and combusted in passenger vehicles. This assumption provides for a conservative estimate of potential downstream GHG emissions associated with end uses of the crude oil transported by the Project because they account for some of the highest GHG emissions among the potential end uses. Refining and passenger vehicle combustion GHG emission rates were based on U.S. emission rates for these activities, which is consistent with the purpose and need of the Project. Some of the crude oil transported by the Project may be exported to other countries, in which case the amount of GHG emissions associated with refining and passenger vehicle combustion may vary; however, no information is currently available regarding the amount of oil that may be exported or the countries to which the oil may be exported; therefore, using U.S. emission rates is the best available information for this analysis.

Table 3.12.3-2 presents the results of this analysis, which represents the maximum capacity of crude oil that could be transported by the Project (1.1 million bpd or 46.2 million gallons per day). The downstream refining and combustion GHG emissions presented in Table 3.12.3-2 already occur as part of the petroleum supply chain; as discussed above, the Project would have little impact on downstream consumption. These calculations are based on 2020 crude oil refining GHG emission estimates, 2020 U.S. crude oil supply estimates, and gasoline and diesel combustion GHG emission estimates. Detailed emission calculations and methodology/assumptions are included in Appendix K.

Table 3.12.3-2: Estimated GHG Emissions from the End Use of Crude Oil That Would Be Transported by the Project

Activity Category	Emission Estimates
	CO_2e (metric tons per year)
Downstream Refining and Combustion	
Crude Oil Refining [a]	498,249
Gasoline Combustion [b]	71,362,610
Diesel Combustion [b]	49,047,240
Total of Downstream CO_2e Emissions	**120,908,099**

CO_2e = carbon dioxide equivalent
[a] Source: EPA, 2022a; See Appendix K for calculation details
[b] Source: EPA, 2022b; See Appendix K for calculation details

As discussed above, denying the easement would likely result in the at least temporary shut-in of between 3,460 and 5,400 wells in the Bakken Region, stranding 320,000 to 500,000 bpd due to unavailable transportation options (Makholm Declaration). If an easement across Lake Oahe was denied, this could result in higher transportation costs or constraints for oil from the Bakken Region, which, depending on the price of oil at the time, may cause production to shift from the Bakken Region to other oil production regions and could affect overall oil production and consumption. Oil production from the Bakken Region produces, in general, more GHG emissions per barrel of oil produced as compared with the U.S. crude oil production baseline (Brandt et al., 2015) primarily due to flaring of methane and other GHGs from wellheads. However, it is a goal of the North Dakota Industrial Commission to control flaring of methane (North Dakota Industrial Commission, 2014), which would reduce the GHG emissions per barrel of oil produced from the Bakken Region and to levels similar to average U.S. oil production GHG emissions. This goal is supported by the North Dakota Legislature, which approved a $150 million appropriation in November 2021 to support expanded natural gas pipeline transportation in the state and minimize flaring excess gas in the oil fields. Under present energy market conditions, the absence of Bakken crude would likely be replaced by oil from another production field. It is impossible to predict if substitution of other oil for Bakken oil would result in a net increase or decrease in overall GHG emissions associated with oil production activities because this would depend upon the GHG emissions associated with extraction at the substitute oil sources, the GHG emissions associated with moving that oil to market, and the degree to which GHG emission collection systems are deployed in the Bakken field.

Multiple commenters and cooperating agencies stated that the Project was not in line with the United States climate change goals of limiting reliance on fossil fuel as an energy source. However, this EIS is analyzing the impacts associated with the Project as proposed and alternatives that would meet the objectives outlined in Section 1.2, [Introduction and Background] Purpose and Need. The amount of crude oil produced in the United States and globally, as well as the amount of crude oil consumed, is not reliant on or constrained by the oil pipeline transportation system because other transportation methods exist. Specifically, the USACE does not have authority over the quantity of crude oil extracted in the Bakken Region, which is the point of generation of the oil that passes through DAPL. These activities are driven by other supply and demand factors that are not within the authority of the USACE.

3.12.4. GHG Impact Assessment

Currently, there is no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment to the Project's incremental contribution to GHGs. The USACE has considered atmospheric modeling used by the EPA, National Aeronautics and Space Administration, the Intergovernmental Panel on Climate Change, and others and finds that these models are not reasonable for project-level analysis for a number of reasons. For example, these global models are not suited to determine the incremental impact of individual projects due to both scale and overwhelming complexity. The USACE also reviewed simpler models and mathematical techniques to determine global physical effects caused by GHG emissions, such as increases in global atmospheric CO_2 concentrations, atmospheric forcing, or ocean CO_2 absorption. The USACE could not identify a reliable, less complex model for this task and is not aware of a tool to meaningfully attribute specific increases in global CO_2 concentrations, heat forcing, or similar global impacts on Project-specific GHG emissions. Similarly, it is not currently possible to determine localized or regional impacts from GHG emissions from the Project. Absent such a method for relating GHG emissions to specific resource impacts, potential GHG-related impacts attributable to this Project are not able to be assessed. Without the ability to determine discrete resource impacts, this EIS is unable to determine the significance of the Project's contribution to climate change.

However, three tools that allow agencies to capture the full costs of GHG emissions by taking global damages into account are the "social cost of carbon", "social cost of nitrous oxide", and "social cost of methane" tools. These tools provide estimates of monetary damages associated with GHG emissions by assessing climate change-related impacts such as agricultural productivity, human health, property damage from increased flood risk, and the value of ecosystem services (86 Fed. Reg. 7037). As directed by EO 13990, a U.S. Interagency Working Group issued interim technical guidance in February 2021 establishing social costs of carbon, nitrous oxide, and methane (IWG, 2021). Based on the social costs provided in this guidance, this EIS calculates the aggregate social cost based on the GHG emissions associated with the past construction of the Project. Table 3.12.4-1 provides the estimated social cost of carbon, nitrous oxide, and methane and includes a discount rate ranging from 3 percent 95th Percentile to 5 percent average. This range of discount rates reflects the current range of variability in research related to global social impacts of GHG emissions and captures the range of potential social costs. On November 11, 2022, the EPA released draft revisions to the social cost of GHGs; however, at the time of publication of this Draft EIS, the revisions have not yet been adopted as final. Therefore, the social cost of GHG emissions presented in Table 3.12.4-1 are based on the current social cost of GHG estimates.

Table 3.12.4-1: Estimated Social Cost of Construction GHG Emissions

Construction Emission Type	5% Average Discount Rate	3% Average Discount Rate	2.5% Average Discount Rate	3% 95th Percentile Average Discount Rate
CO_2	$91,497	$333,311	$496,698	$993,396
Nitrous Oxide	$81	$182	$242	$7,382
Methane	$892	$2,419	$3,553	$472
Total	$92,470	$335,911	$500,493	$1,001,250

CO_2 = carbon dioxide
Notes: Calculated based on social cost of carbon, social cost of nitrous oxide, and social cost of methane for 2020 (86 Fed. Reg. 7037). See Appendix K for calculation details.

As shown in Table 3.12.4-1, the social cost of construction emissions range from $92,470 to $1,001,250 depending upon the discount rate chosen. This range of potential social costs shows the large variation in results. There is currently no basis for choosing a particular discount rate or for designating a particular monetized value as significant.

The construction-related GHG emissions associated with the Project occurred over a relatively short time period, did not require an air permit under the CAA, and resulted in a relatively small social cost associated with the GHG emissions. Based on these factors, the construction-related GHG emissions associated with the Project would have a direct, short-term, and negligible effect on climate change.

As noted above, normal operation of the pipeline across Lake Oahe does not generate any direct GHG emissions, with the exception of a small amount of GHG emissions associated with periodic pipeline maintenance activities. Therefore, the operation of the Project does not have an incremental effect on climate change. The potential climate change effects of the production of and end-use of the crude oil transported by the Project are addressed in Section 3.12.3.7. The social cost of downstream GHG emissions for the maximum capacity of crude oil that would be transported by the Project are provided in Appendix K and would vary by operational year. For operational year 2020, the social cost of downstream GHG emissions would range from $1,692,713,386 to $9,189,015,526 depending on the discount range chosen; and for operational year 2050, the social cost of downstream GHG emissions would range from $3,869,059,169 to $14,025,339,487 depending on the discount range chosen. Social cost of carbon estimates are not currently available beyond 2050; therefore, the calculations have been estimated through 2050. As noted in Section 3.12.3.7, these GHG emissions and associated social costs would occur with or without the Project.

North Dakota does not have a climate change action plan; however, pipeline transportation of crude oil is less GHG intensive than some alternative transportation methods, such as trucking options. Overall, each of the five alternatives would result in additional GHG emissions. Alternative 1 would result in the greatest amount of additional GHG emissions due to the length of time required to remove the pipeline.

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4. CUMULATIVE IMPACTS

4.1. INTRODUCTION

Cumulative impacts could result from the combination of individually minor effects of multiple actions over time (adapted from CEQ, 1997). The CEQ regulations for implementing NEPA define cumulative effects as follows:

> The impact on the environment which results 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 effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

The *Environmental Consequences* sections of Chapter 3, Affected Environment, Impacts, and Mitigation, present the direct and indirect effects of the alternatives on each resource's affected environment as presented in the *Affected Environment* sections of that same chapter. The resource conditions described in those sections account for the effects to resources related to past actions. This Chapter 4, Cumulative Impacts, further considers the cumulative effects of each alternative combined with reasonably foreseeable future actions (RFFAs) and conditions for all resources. The goal of this assessment is to concentrate on the accumulation of meaningful impacts of greatest concern that may have been associated with Project construction and operations or may be associated with Alternatives 1 through 5. This requires an analysis of the direct and indirect effects of the Project and the alternatives in combination with other past, present, and RFFAs potentially affecting the resources within the geographic scope for the assessment. This analysis incorporates by reference and builds on the USACE's cumulative impact analysis in the 2016 EA.

The subsequent sections describe the following four-step approach used to conduct the cumulative impacts assessment:

- Step 1: Identify Affected Resources
- Step 2: Establish Boundaries (Geographic and Temporal)
- Step 3: Identify Past, Present, and Reasonably Foreseeable Future Actions
- Step 4: Analyze Cumulative Impacts

4.1.1. Step 1: Identify Affected Resources

In this step, each resource affected by the Project or alternatives of minor to major intensity is identified. Negligible impacts on resources from the Project or alternatives are not included in the cumulative impacts analysis as the Project would not contribute any impacts, so it cannot contribute to any cumulative impacts. Chapter 3, Affected Environment, Impacts, and Mitigation, identifies relevant issues and trends in the environmental baseline including effects from past activities and HDD crossing construction and operation. Direct and indirect effects that may result from Alternatives 1 through 5 are described in detail in Chapter 3 and summarized in this section as relevant to the cumulative impacts assessment.

4.1.2. Step 2: Establish Boundaries (Geographic and Temporal)

Affected resource-specific geographic and temporal boundaries considered in this analysis are described below. According to NEPA regulations (40 CFR § 1508.7), cumulative impacts should be based on the specific federal action under consideration. In this case, the federal action involves granting or not granting a real estate easement to Dakota Access for the Project on federal lands at Lake Oahe. The geographic boundary is consequently where direct and indirect impacts occurred or would occur on resources (e.g., soils, vegetation, air quality) within the temporal scope as a result of activities on the federally owned land at Lake Oahe (the Project Area). The temporal scope defines the timeframe during which Project construction or operational impacts occurred or may occur with the implementation of the alternatives.

Together, the temporal and geographic scope define when and where actions could contribute to cumulative impacts on the affected resource. Actions being constructed outside these boundaries were not evaluated because their potential to contribute to a cumulative impact diminishes with increasing geographic and temporal distance from the Project.

4.1.2.1. Geographic Scope

Table 4.1.2-1 summarizes the resource-specific geographic boundaries considered in this cumulative impacts analysis. Boundaries were identified to be inclusive of direct and indirect impacts associated with the Applicant Proposed Action.

Table 4.1.2-1: Geographic Scope for the Cumulative Impacts Assessment

Resource	Geographic Scope
Geology and Soils	Areas within and adjacent to the Project Area (including the right-of-way and the workspace)
Water Resources	HUC-12 subwatershed (HUC-12 101302060304, 101302060305, and 101301020304)
Vegetation and Noxious Weeds	Areas within and adjacent to the Project Area
Wildlife and Aquatic Resources	HUC-12 subwatershed (HUC-12 101302060304, 101302060305, and 101301020304)
Land Use and Recreation	1 mile from the Project
Cultural Resources	1 mile from the Project
Socioeconomics, Environmental Justice, and Health	Sioux County and Census tracts CT9665 and CT204
Transportation and Traffic	ND Highways 1804 and 1806, Northern Border permanent access road
Hazardous Waste	1 mile from the Project
Reliability and Safety	Areas within and adjacent to the Project Area
Air Quality—Construction	0.25 mile from the Project
Air Quality—Operation	30 miles of Project
Noise	1.0 mile from the Project
Climate Change	Regional, national, and global scale (includes actions within Sioux County and Census tracts CT9665 and CT204)

HUC = Hydrologic Unit Code; Northern Border = Northern Border Pipeline Company

The definition of the geographic scope of cumulative impacts relies entirely on knowledge of the location of a proposed action or alternative in order to identify other past, present, or reasonably foreseeable future actions. As stated in Section 2.6.3, Alternative 5: North Bismarck Reroute, although the North Bismarck Reroute is used as a proxy for a reroute, the route that Dakota Access would seek under Alternative 5 is unknown. A cumulative impact assessment based specifically on the location of North Bismarck Reroute would have little relevance to the actual cumulative impacts of the unknown route and is therefore not included in the geographic scope of cumulative effects.

4.1.2.2. Temporal Scope

The temporal boundaries for cumulative effects in this analysis have three components: past, present, and future. In this analysis, effects that have occurred prior to 2017 (construction and early operation of the Project) are considered past actions and have been discussed in the *Affected Environment* sections of Chapter 3, insofar as they are relevant to effectively describing the existing condition of each resource. Conversely, effects that have occurred after 2017 and other reasonably foreseeable effects are included in this chapter. Construction and initial operation of the Project began in 2017, and the Project is currently in operation. This cumulative impact analysis considers actions that may result in cumulative impacts with the Project or alternatives that are within the geographic scope of analysis beginning in 2017. While recent past actions that continue to contribute discernable impacts on a resource are included (e.g., a project that is operational, but restoration/revegetation is not complete), the impacts of completed/past actions that have occurred prior to 2017 are considered part of the affected environment (baseline environmental conditions) described in Chapter 3.

4.1.3. Step 3: Identify Past, Present, and Reasonably Foreseeable Future Actions

Actions included in the cumulative impact analysis meet the following criteria:

- The action affects or may affect a resource that is also potentially affected by the Project;
- The action causes or may cause impacts within all or part of the temporal scope encompassed by the construction or operations schedule of the Project; and
- The action causes the impact(s) within all or part of the same geographical area affected by the Project.

These actions include (but are not limited to) those that are being implemented, have been funded, are under review by a regulatory agency, or are being considered by state and local planners. Actions that have not progressed beyond planning and feasibility stages of development are not included in the analysis due to the uncertainty of whether the projects will be implemented.

This analysis builds on the USACE's cumulative impact analysis in the 2016 EA, including updates to actions that were considered in the 2016 EA and any new actions that were not previously under consideration. New actions were identified by searching publicly available regulatory and planning databases specifically related to energy development (e.g., wind farms, oil and gas pipelines, mining and mineral extraction activities) and transportation projects. The analysis considers impacts of the Project and alternatives that are described in this EIS, particularly those related to subsistence, environmental justice, release risk assessment, and climate change and GHG impacts.

Of note, this cumulative impacts analysis focuses on those cumulative effects associated with normal operations of the Project for Alternatives 3 and 4. Discussed throughout this EIS, all of the alternatives include the risk and potential impacts of crude oil release scenarios, whether through normal operations under Alternatives 3 and 4, through abandonment activities under Alternatives 1 and 2, or through interim truck and rail operations and operations of a rerouted pipeline under Alternatives 1, 2, and 5. Given the substantial uncertainty regarding the nature of a potential crude oil release and the remote to very unlikely likelihood of such an event, it is not reasonable to forecast and quantify the size, location, and timing of a potential release and what cumulative actions may occur at the same location and time. Section 3.1.6.3, [Reliability and Safety, Impacts and Mitigation, Alternative 3], Modeled Discharge Scenarios, presents a range of potential crude oil release scenarios, including the most credible large release scenario. If any of these remote to very unlikely scenarios occurred, the direct/indirect effects on various resources could range from minor to major and temporary to long-term on their own as described throughout this EIS. Mitigation actions are identified throughout Chapter 3 of this EIS that are designed to reduce the likelihood of a crude oil release and the potential impact on various resources.

Alternative 5 involves the construction of a pipeline that would generally occur outside the geographic and temporal scope of the proposed federal action to grant or not grant an easement at the Lake Oahe crossing. At its closest point, the North Bismarck Reroute would be located about 13 miles from the Lake Oahe crossing. In addition, the timing of construction and operations of the North Bismarck Reroute is anticipated to be at least 3 years from the issuance of the USACE Record of Decision for the Project due to the need for planning, permitting, and other considerations. Therefore, any RFFAs that might occur within the same timeframe and contribute to cumulative impacts along with Alternative 5 are not considered reasonably foreseeable at this time. In conclusion, based on the distance of the North Bismarck Reroute from the Lake Oahe crossing and the amount of time that would pass before the North Bismarck Reroute could be constructed, cumulative impacts cannot be assessed for the construction of the reroute. Rather, the assessment of cumulative impacts for Alternative 5 is generally limited to the abandonment of the portion of DAPL Project adjacent to the Lake Oahe crossing, which would occur within the same geographic and temporal scope of a proposed federal action to not grant the easement at Lake Oahe, should that be the USACE's decision. Socioeconomics, environmental justice, subsistence, health, air quality, and climate change have a wider geographic scope that could encompass cumulative impacts from construction of the North Bismarck Reroute should the temporal scopes overlap.

Based on the criteria described above, the following actions were identified that could contribute to cumulative impacts with Alternatives 1 through 5 on one or more resources:

- Crude oil transport
  - DAPL Project (Mountrail, Williams, McKenzie, Dunn, Mercer, Morton, and Emmons counties), excluding the portion of the DAPL Project that crosses Lake Oahe and makes up the Applicant Proposed Action (referred to throughout this EIS as "the Project")
  - DAPL Project Optimization (Emmons County)

- Wind energy
  - Anpetu Wi Wind Farm (Sioux County)
  - Emmons-Logan Wind Project and Transmission Line (Emmons County)
  - Oliver III Wind Energy Center Project (Oliver and Morton counties)
- Electric Transmission Line
  - Emmons-Logan Wind Transmission Line (Emmons County)
  - Montana-Dakota Utilities Co. Mandan to Ellendale Upgrade Project (Morton and Emmons counties)
- Agriculture
  - Ranching (livestock grazing) and crop cultivation

Table 4.1.3-1 provides additional details of these actions.

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Table 4.1.3-1: Present and Reasonably Foreseeable Future Actions

Project Name	Project Description	Approx. Size	Status	Construction Start – End Dates	County(ies)	Approx. Distance from Project (miles)	Resources with Potential for Cumulative Impacts [a]
Crude Oil Transportation							
DAPL Project (PU-14-842)	Construct 1,150 miles of new crude oil pipeline. Construction of two main underground pipeline components and six tank/pump stations. The supply line is 148 miles long beginning near Stanley, North Dakota, extending to the west and then south around Lake Sakakawea and ending up east of Watford City.	358 miles in North Dakota, 272 miles in South Dakota, 345 miles in Iowa, 179 miles in Illinois	Complete	January 2016 – June 2017	Mountrail, Williams, McKenzie, Dunn, Mercer, Morton, Emmons	0	All Resources
DAPL Project Optimization (Dakota Access, LLC) (PU-19-204)	Dakota Access is proposing this project to optimize and upgrade the DAPL Project by increasing capacity to transport crude oil. The optimization would provide an increase in the transportation capacity of crude oil on the existing DAPL Project, from 570,000 barrels per day to up to 1,100,000 barrels per day, by installing a new pump station facility consisting of up to 30,000 horsepower of electronically driven motors and pumps contained within a building.	21 acres	Partially Completed	October 2020 – 2021	Emmons	17	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change [b]
Wind Energy							
Emmons-Logan Wind Project (PU-18-280)	Emmons-Logan Wind Energy Center (Emmons and Logan counties); 102 turbines, approximately 64,563 acres.	64,563 acres	Complete	2019 – February 2020	Emmons and Logan	20	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change
Anpetu Wi Wind Farm	The wind farm will have a capacity of 235 megawatts and will be located on the Standing Rock Reservation outside of Fort Yates in Sioux County, North Dakota.	Unknown	Planning	Unknown	Sioux	24	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change
Emmons-Logan Wind Transmission Line (PU-18-281)	The wind farm has a capacity of approximately 298.1 megawatts and consists of 102 wind turbine generators and associated facilities. The project includes a 6.85-mile long, 230-kilovolt transmission line in Emmons County. The line connects the wind project to the existing 230-kilovolt Heskett-Wishek transmission line.	6.85 miles long	Complete	February 2019 – December 2019	Emmons	20+	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change
Oliver III Wind Energy Center (Oliver Wind III, LLC) (PU-16-123)	Wind to electricity; Wind Energy Conversion Facility; Construction of a 100-megawatt wind facility in Oliver and Morton counties, consisting of 48 wind turbines.	21,878 acres	Complete	July 2016 – January 2017	Oliver and Morton	40	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change
Electric Transmission Line							
Montana-Dakota Utilities Co. Mandan to Ellendale	230-kilovolt electric transmission line upgrade.	Unknown	Not available	Unknown	Morton and Emmons	Unknown	Socioeconomics, Environmental Justice, Treaty Rights, Subsistence, Health, Climate Change
Agricultural Practices							
Ranching and crop cultivation	Livestock grazing occurs in the Project Area on both sides of Lake Oahe, while a cultivated field occurs on the east side of Lake Oahe adjacent to the Project Area.	Unknown	Ongoing	Unknown	Morton and Emmons	0+	Soils, Water Resources, Vegetation and Noxious Weeds, Wildlife and Aquatic Resources, Socioeconomics, Air Quality, Climate Change

Sources: AECOM, 2018a and 2018b; Crowley Fleck, 2020; Dakota Access LLC, 2014 and 2019; Fredrikson & Byron, 2019a and 2019b; Keitu, 2017; NextEra Energy Resources, 2017; North Dakota Public Service Commission, 2020; Tetra Tech, 2016; State of North Dakota Public Service Commission, 2019a, 2019b, 2019c, 2020, and 2021

[a] Resources were determined to have the potential for cumulative impacts for a particular reasonably foreseeable future action (RFFA) if that action fell within the resource's geographic scope, as listed in Section 4.1.2, Step 2: Establish Boundaries (Geographic and Temporal).
[b] While increased throughput associated with the Project is addressed in Chapter 3, Affected Environment, Impacts, and Mitigation, the impacts of the construction and operation of facilities associated with the Optimization Project that are not directly associated with the Project (i.e., new pump station facility) are addressed in this chapter, Cumulative Impacts.

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Protests took place at or near the DAPL Project construction sites. These protests contributed to road closures, waste generation, and likely contributed to temporary soil disturbance adjacent to the Project Area from protest vehicles driving off-road and other protest activities. The protests related to the original construction were not predicted and are unrelated to the current scope of work as there is no new construction proposed. For these reasons, impacts related to the protests are not analyzed further in this cumulative impacts assessment. In addition, scoping comments identified concerns related to public health (physical and mental harms) and excessive force by law enforcement during or as a result of the protests. These issues are more appropriately addressed through the legal court system and are therefore not addressed in this EIS.

4.1.4. Step 4: Analyze Cumulative Impacts

For each resource, the actions identified in Step 3 are analyzed in combination with the impacts of the Project and alternatives. The analysis includes:

- Screening direct and indirect effects, when combined with the effects of other actions, to identify incremental effects (both beneficial and adverse) that are potentially cumulative.
- Evaluating the impact of cumulative effects using the significance criteria described in Chapter 3 and assessing the contribution of Alternatives 1 through 5 to cumulative effects.

The indirect impacts associated with Alternatives 1 and 2, including alternate transportation via truck, rail, or alternative pipeline route, are incorporated into the impact assessment in Chapter 3. Therefore, the impacts disclosed in the cumulative impacts assessment are inclusive of these indirect impacts.

The analysis provides rationale for conclusions, citing evidence from peer-reviewed literature and quantitative information where available. The term “unknown” is used where there is not enough information to determine an impact level.

4.2. CUMULATIVE IMPACTS BY RESOURCE

4.2.1. Reliability and Safety

DAPL Project construction and/or restoration occurred in areas adjacent to the Project Area at the same time of construction/restoration of infrastructure related to the Project. There were no reliability and safety impacts as a result of DAPL Project construction or the first few years of operation. No other actions were identified that would contribute to future cumulative reliability and safety impacts for the five alternatives within the geographic and temporal scope of this analysis.

4.2.2. Geology and Soils

Ranching activities, crop cultivation, and the DAPL Project may have affected or could affect geology and soils within or adjacent to the Project Area.

While restrictions prevented livestock grazing from occurring within the temporary workspaces for the Project Area until restoration was complete, grazing activities and crop cultivation continued to occur adjacent to the Project Area. Accelerated erosion can occur due to over-grazing (USDA NRCS, 1995). Over-grazing in these areas is not known to have occurred during Project construction and restoration, and there were likely no cumulative past impacts from livestock grazing on geology and soils. Soil erosion from cultivated fields is more seasonal and can occur before vegetation is established each growing season.

DAPL Project construction and/or restoration occurred in areas adjacent to the Project Area at the same time as construction/restoration of infrastructure associated with the Project. The construction right-of-way for the DAPL Project was cleared of vegetation and debris. DAPL Project construction could have resulted in soil compaction, the mixing of subsoil with topsoil, and soil erosion from exposed soils. Dakota Access implemented mitigation measures to minimize or reverse impacts, including erosion control devices, topsoil segregation, compaction monitoring, and, if needed, remediation for compaction. To the extent feasible, they also restored the areas affected by pipeline construction to pre-construction contours and similar vegetation (with the exception of the permanent access road).

A permanent access road was constructed through the Project Area that connects the nearby valve site with a public road. This new road contributed to soil disturbance by creating a path of permanently compacted soil with a gravel surface through the Project Area.

As a result, cumulative impacts with the Project are likely to have occurred during construction and the first several years of operation. The cumulative effect of the DAPL Project and the Project on soils and surface geology was temporary and minor because the effects were limited to construction activities within the right-of-way. Contributions from any soil erosion from the cultivated field adjacent to the Project on the east side of Lake Oahe were likely minor and seasonal. To further minimize potential erosion and sedimentation of wetlands and waterbodies on the DAPL Project and Project, temporary erosion control devices were installed and maintained throughout construction. The soils and surface geology affected by the Project and the DAPL Project were restored to pre-construction conditions (Dakota Access, LLC., 2014), with the exception of the permanent access road to the DAPL Project valve site. A revegetation inspection report dated November 2018 indicated that vegetation appeared to be re-established as near as practical to pre-construction conditions and that overall, the Project was well-maintained, secured, and in good condition (Keitu, 2018). With the reestablishment of vegetation, soils should be stabilized and soil structure recovering.

Based on this analysis, past cumulative impacts on soils and geology as a result of the Project, the DAPL Project, and crop cultivation were short-term, minor, and not significant. No cumulative impacts on mineral resources, geologic hazards, and paleontology were identified.

Alternative 1, removal of the pipeline, would require disturbance of the lakebed using a construction technique similar to open surface mining that would impact the quality of the river post reclamation and would be impossible to place back to pre-existing conditions. Approximately 12.3 million cubic yards of excavated material would be stockpiled on about 1,400 acres of land. Excavation would occur behind cofferdams. The stockpiled soils would consist of loose, saturated sediments with a high risk of slope failure. loose, saturated sediments with a high risk of slope failure. Due to the extensive construction period, complex engineering design, and working with saturated lakebed sediments in land with a high landslide incidence and/or susceptibly, there is a potential for long-term, major impacts if failure of the cofferdams, bench slopes, or stockpiled material occurs. Finally, compaction of soils would occur from the placement of stockpiled materials and heavy equipment traffic over the extended construction period, affecting restoration potential of the surrounding lands, including prime farmland. As a result, impacts on soils, geology, and geologic hazards from pipeline removal would result in long-term, if not permanent, effect and are anticipated to be a major alteration of the resource character, resulting in significant impacts. Erosion and/or compaction from crop cultivation and livestock grazing could contribute cumulatively to pipeline removal impacts, although to a limited extent compared to the impacts of Alternative 1. As a result of the direct and indirect effects identified above, Alternative 1 would result in significant impacts on geologic resources regardless of cumulative impacts.

Alternative 2, abandonment of the pipeline in place, would disturb about 13 acres of land during construction to expose, cut, and cap the pipeline in place. Disturbed areas would be stabilized and revegetated, and impacts would not be significant. When combined with potential erosion and compaction impacts from crop cultivation and livestock grazing, the impact on geology and soils may be slightly increased but is not expected to be significant.

As discussed throughout Chapter 3, impacts associated with Alternatives 1 and 2 are likely to also include constructing and operating the North Bismarck Reroute (Alternative 5). See the discussion below for a combined impact determination with Alternative 5.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3 and 4.

Under Alternative 5, abandonment (in place or by removal) of a small portion of the about 100 miles of the DAPL Project could result in dispersed areas of temporary, minor impacts within the same HUC-12 subwatersheds as the Project, where exposing, cutting, and capping the pipe would require excavation and the use of heavy equipment within right-of-way previously disturbed for DAPL Project construction. The resulting soil disturbance could contribute to cumulative impacts due to soil compaction and disturbance along with any lingering effects from DAPL Project construction. Given the small areas affected, the cumulative impacts would be temporary to short-term and minor. Overall, the cumulative impact significance determinations for Alternatives 1 or 2, as described above, would not be altered when considered in conjunction with Alternative 5.

4.2.3. Water Resources

The DAPL Project, livestock grazing, and crop cultivation could have affected groundwater, surface water, and/or wetlands within the same HUC-12 subwatershed as the Project. The DAPL Project and the associated aboveground facilities, including the valve site, are located in the same HUC-12 subwatersheds as the Applicant Proposed Action (HUC-12 101302060304, 101302060305, and 101301020304). No actions were identified that would have contributed to cumulative impacts on floodplains or levees.

The DAPL Project and crop cultivation may have affected water resources through stormwater runoff from disturbed ground into wetlands and waterbodies in the same HUC-12 subwatersheds, including Lake Oahe. Drilling and dewatering activities for the DAPL Project had the potential to influence regional groundwater flow patterns, although shallow aquifers were not affected because well points to dewater work areas were not required. Livestock grazing could similarly affect water resources through the potential for stormwater runoff from disturbed ground. Any temporary impacts on water resources as a result of Project construction and the first few years of operation were short-term and negligible to minor and would therefore not have contributed meaningfully to cumulative impacts, while erosion due to livestock grazing is not known to have occurred in the Project Area (see Section 4.2.2, Geology and Soils).

Based on the assessment above, past cumulative impacts on water resources are not considered significant.

Potential construction impacts on Lake Oahe under Alternative 1 would entail removing the pipeline from beneath Lake Oahe. Equipment excavating within Lake Oahe would require about 1,400 acres to store the excavated material onshore, which would potentially impact two mapped waterbodies and additional waterbodies would likely be impacted by access road crossings. Excavation and backfilling would result in long-term impacts on water quality (elevated turbidity) and increased potential for an accidental release of contaminants from equipment. These disturbances would have a long-term, moderate impact on downstream water supplies in Lake Oahe. Water quality conditions are expected to return to baseline within 1 to 2 years of restoration, depending on flow conditions in the channel. As a result, these impacts would not be considered significant. Erosion and/or compaction from livestock grazing and crop cultivation could contribute cumulatively to surface water impacts, although to a limited extent compared to the impacts of Alternative 1. Impacts on water resources from crop cultivation and livestock grazing are negligible to minor; therefore, the cumulative effect from these disturbances along with activities under Alternative 1 would not be significant.

Under Alternative 2, dewatering activities during pipeline abandonment in place could release temporary, negligible sediment runoff to Lake Oahe. Implementation of mitigation measures such as erosion control devices would help prevent sediment-laden water from entering Lake Oahe. Impacts on water resources from crop cultivation and livestock grazing are negligible to minor; therefore, the cumulative effect from these disturbances along with activities under Alternative 2 would not be significant.

As discussed throughout Chapter 3, impacts associated with Alternatives 1 and 2 are likely to also include constructing and operating the North Bismarck Reroute (Alternative 5). See the discussion below for a combined impact determination with Alternative 5.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3, 4, and 5 within the geographic and temporal scope of this analysis.

Overall, the cumulative impact significance determinations for Alternatives 1 or 2, as described above, would not be altered when considered in conjunction with Alternative 5.

4.2.4. Vegetation and Noxious Weeds

The DAPL Project construction and operations, crop cultivation, and livestock grazing may have affected or could affect vegetation and noxious weeds within or adjacent to the Project Area.

The DAPL Project construction and restoration occurred in areas adjacent to the Project Area at the same time as construction and restoration of the Project. During pipeline construction of the DAPL Project, vegetation was cleared from within the construction right-of-way as well as temporary workspace areas. The permanent access road constructed for the DAPL Project resulted in the permanent loss of vegetation in the roadway where it crosses the Project Area.

While restrictions prevented livestock grazing from occurring within the temporary workspaces for the Project until restoration was complete, grazing activities and crop cultivation continued to occur adjacent to the Project Area. Following restoration of the Project and DAPL Project, these agricultural activities may have disturbed the revegetated construction area and contributed to the potential spread of noxious weeds, particularly with over-grazing as accelerated erosion can occur due to over-grazing (USDA NRCS, 1995). Over-grazing is not known to have occurred during Project construction and restoration.

These activities contributed to short-term, minor cumulative impacts on vegetation during construction and the first several years of operation. Revegetation of Project construction workspaces was completed in 2017. A revegetation inspection report dated November 2018 indicated that vegetation appeared to be re-established as near as practical to pre-construction conditions and that overall, the Project was well-maintained, secured, and in good condition (Keitu, 2018). This would also indicate that crop cultivation and grazing have not been detrimental to revegetation in the Project Area. Dakota Access, to the extent feasible, restored the areas affected by pipeline construction to pre-construction contours and similar vegetation as specified in its ECP (with the exception of the permanent access road). The DAPL Project has also resulted in the permanent loss of vegetation within the permanent access roadbed; however, there was no equivalent loss due to the Project that resulted in permanent cumulative impacts.

Noxious and other invasive weeds can be spread as a result of ground disturbance, which creates openings for weed establishment, and the transport of weed seeds and other propagules from existing infestations to disturbed areas, such as on vehicle tires, boots, wind, and wildlife or livestock (Sheley et al., 1996). The Project, DAPL Project, crop cultivation, and livestock grazing could all have contributed to weed spread through ground disturbance and/or weed transport. Some small areas of rangeland appeared to have dominant undesirable and early succession species present after restoration, which is common during the early stages of revegetation (Keitu, 2018). When combined with the DAPL Project, crop cultivation, and grazing, an increase in the presence of noxious weeds could extend along the pipeline route and within the adjacent rangeland and cultivated fields. Prior to clearing and grading of the construction right-of-way and pending landowner permission, major infestation areas identified during surveys or Project field assessments may be treated with herbicides (per required permitting/certification and state laws) by state-certified applicators. Dakota Access sprayed weeds within the HDD entry/exit sites and pull-back construction areas on both sides of Lake Oahe in 2017 and 2018 and on the west side of Lake Oahe in 2019; they will continue to do so in the future as needed. With the implementation of the weed management measures specified in the ECP, any introduction and spread of noxious weeds from the DAPL Project and the Project would have had a short- to long-term, moderate impact on vegetation in the affected area.

Based on the assessment above, past cumulative impacts on vegetation from disturbance and the potential introduction and spread of noxious weeds are not considered significant.

Alternative 1, removal of the pipe from under Lake Oahe, would involve a high level of water and soil disturbance for an estimated 6 to 20 or more years and the potential introduction or spread of noxious weeds during construction activities associated with pipe excavation and removal. Construction to remove the pipe would require the excavation of an estimated 77 acres, which includes both banks of Lake Oahe, as well as the lake bottom. Additionally, storage of the excavation spoils would require an estimated 1,400 acres, which would impact vegetation at the storage location. The direct impacts on vegetation in the permanent right-of-way and construction workspace due to excavation and spoil storage under Alternative 1 is expected to be long-term but localized, resulting in a major and significant impact on vegetation. No significant cumulative impacts from crop cultivation or grazing are anticipated.

Alternative 2, abandoning the pipe in place, would result in the temporary disturbance of vegetation at the former HDD entrance and exit locations during purging, cutting, and capping of the pipe. The direct impacts on vegetation in the Project Area outside of federal lands under Alternative 2 is expected to be temporary and highly localized, resulting in a minor impact on vegetation and noxious weeds. No significant cumulative impacts from crop cultivation or grazing are anticipated.

As discussed throughout Chapter 3, impacts associated with Alternatives 1 and 2 are likely to also include constructing and operating the North Bismarck Reroute (Alternative 5). See the discussion below for a combined impact determination with Alternative 5.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3, 4, and 5 within the geographic and temporal scope of this analysis.

Overall, the cumulative impact significance determinations for Alternatives 1 or 2, as described above, would not be altered when considered in conjunction with Alternative 5.

4.2.5. Wildlife and Aquatic Resources

4.2.5.1. Wildlife

The DAPL Project, including the pipeline and valve site, affected wildlife within the same HUC-12 subwatershed as the Project and alternatives (see Section 4.2.3, Water Resources).

The DAPL Project likely contributed to wildlife disturbance through temporary habitat alteration and degradation, noise, lighting, and human presence. Furthermore, the DAPL Project access road and aboveground facilities resulted in the permanent loss of vegetated habitat in the roadway where it crosses the Project Area.

As a result, cumulative impacts with the Project are likely to have occurred during construction and the first several years of operation. The cumulative disturbance on wildlife from the Project and the DAPL Project were temporary to short-term and minor. The greater noise impact on wildlife would have occurred from the HDD under Lake Oahe for the Project; the DAPL Project would have contributed a lesser amount to noise disturbance (see Section 4.2.11.2, Noise). The cumulative disturbance from noise, lighting, and human presence ceased once restoration on the Project was complete, which occurred in the same year as construction.

Cumulative habitat impacts were primarily short-term and minor because the Project Area has been restored (with the exception of the permanent access road) (see discussion in Section 4.2.4, Vegetation and Noxious Weeds). The DAPL Project also resulted in the permanent loss of habitat within the permanent access roadbed and the footprint of the aboveground facilities; however, there was no equivalent habitat loss due to the Project that resulted in permanent cumulative impacts. Given the abundance of surrounding habitat, the reduction in habitat had a minor impact on wildlife.

Based on the assessment above, past cumulative impacts on wildlife are not considered significant.

No actions were identified that would contribute to future cumulative impacts on wildlife for the five alternatives within the geographic and temporal scope of this analysis.

4.2.5.2. Aquatic Resources

The DAPL Project, crop cultivation, and livestock grazing may have affected or may affect aquatic resources within the same HUC-12 subwatershed as the Project (see Section 4.2.3, Water Resources).

The DAPL Project may have affected aquatic resources through stormwater runoff from disturbed ground into wetlands and waterbodies in the HUC-12 subwatershed. Crop cultivation could have similarly affected aquatic resources through the potential for stormwater runoff from disturbed ground. However, impacts on aquatic resources as a result of Project construction for the first few years of operation were negligible and would therefore not have contributed meaningfully to cumulative impacts. Overgrazing that may have caused erosion problems in these areas is not known to have occurred during Project construction and restoration. Dakota Access sprayed weeds within the HDD entry/exit sites and pull-back construction areas on both sides of Lake Oahe in 2017 and 2018 and on the west side of Lake Oahe in 2019; they will continue to do so in the future as needed. Herbicides may cause biological impairments of waterbodies if they occur in water or sediment at sufficient concentrations. They have relatively low toxicity to fish and invertebrates, and acute toxicity is likely only when they are deliberately or accidentally applied directly to waterbodies (EPA, 2023). Toxic effects as a result of herbicide use during DAPL Project construction and restoration is not known to have occurred. Based on the above, past cumulative impacts on aquatic resources are not considered significant.

For Alternatives 1 and 2, cumulative impacts are anticipated. Impacts on aquatic resources from the abandonment of the pipeline (in place or by removal) in the Project Area would be increased sedimentation and turbidity in Lake Oahe. Future stormwater runoff from disturbed ground due to livestock grazing and crop cultivation could contribute cumulatively to increased turbidity and sedimentation in aquatic habitat, although to a limited extent compared to the impacts of Alternative 1. As a result of the direct and indirect effects identified above, Alternative 1 would result in significant impacts on aquatic resources regardless of cumulative impacts. The limited ground disturbance under Alternative 2 would result in minor cumulative impacts that would not be significant.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3, 4, and 5 within the geographic and temporal scope of this analysis.

4.2.5.3. Threatened and Endangered Species

The same cumulative impacts associated with the DAPL Project, crop cultivation, and livestock grazing discussed above in Section 4.2.5.1, Wildlife, and Section 4.2.5.2, Aquatic Resources, may also have affected or could affect the following federally listed species that could occur in the same HUC-12 subwatersheds as the Project (see Section 4.2.3, Water Resources):

- Interior least tern
- Piping plover
- Rufa red knot
- Northern long-eared bat
- Whooping crane

- Pallid sturgeon
- Monarch butterfly

Because the same mitigation was implemented during construction of the DAPL Project as the Project, potential cumulative impacts would not have been significant because they would not have resulted in adverse or prohibited impacts on these species, as consistent with the determinations in the 2016 USACE BA (USACE, 2016) that covered the entire DAPL Project, including the Lake Oahe crossing. Crop cultivation could have contributed to potential cumulative impacts on pallid sturgeon aquatic habitat from ground disturbance and stormwater runoff; however, impacts on aquatic resources as a result of Project construction for the first few years of operation were negligible and would therefore not have contributed meaningfully to cumulative impacts. Additionally, USFWS notes that pallid sturgeon have not been collected in the stretch of the Missouri River within the Project vicinity in 15 years. Overgrazing causing erosion issues in these areas is not known to have occurred. Therefore, past cumulative impacts on federally listed species are not considered significant.

For Alternatives 1 and 2, cumulative impacts on federally listed species are anticipated. Impacts on northern long-eared bats from the abandonment (in place or by removal) of the pipeline in the Project Area would be increased sedimentation and turbidity in Lake Oahe, which could cause a reduction in prey abundance. Future stormwater runoff from disturbed ground due to livestock grazing and crop cultivation could contribute cumulatively to increased turbidity and sedimentation in aquatic habitat, although to a limited extent compared to the impacts of Alternative 1. As a result of the direct and indirect effects identified above, Alternative 1 would result in minor cumulative impacts that would not be significant: the contribution from livestock grazing and crop cultivation would be negligible. The limited ground disturbance under Alternative 2 could result in minor cumulative impacts that would not be significant. No cumulative impacts were identified for other federally listed species.

As discussed throughout Chapter 3, any impacts associated with Alternatives 1 and 2 are likely to also include constructing and operating the North Bismarck Reroute (Alternative 5). See the discussion below for a combined impact determination with Alternative 5.

No actions were identified that would contribute to future cumulative impacts with Alternatives 3 and 4.

Under Alternative 5, abandonment of a portion of the DAPL Project within the geographic scope of this analysis but outside of the Project Area could have significant adverse effects on Dakota skipper. The DAPL Project also had adverse effects on this species in Dunn, McKenzie, and Mountrail counties according to previous consultation (USACE, 2016). However, because DAPL Project impacts on Dakota skipper were related to construction several years ago, affected populations are likely to have recovered, and cumulative impacts would likely be negligible. Therefore, although Project impacts on federally listed species from Alternative 5 would be significant, any additional cumulative impacts would be negligible. Similarly, although the combined Project impacts of Alternative 1 and 5 or Alternatives 2 and 5 would be significant, additional cumulative impacts would be negligible.

4.2.6. Land Use and Recreation

The DAPL Project occurs within 1 mile of the Project Area and may have affected or could affect land use and land ownership. No recreation or special interest areas are known to occur within 1 mile of the Project Area; therefore, cumulative impacts on these resources would not occur.

DAPL Project construction and/or restoration occurred in areas adjacent to the Project Area at the same time as construction/restoration of infrastructure related to the Project. The construction right-of-way for the DAPL Project was cleared of vegetation and debris, and a permanent access road was constructed through the Project Area that connects the nearby valve site with a public road. The DAPL Project access road resulted in the permanent loss of rangeland forage in the roadway where it crosses the Project Area. In addition, the DAPL Project affected land ownership through the creation of right-of-way easements on private land.

Cumulative impacts with the Project occurred during construction and the first several years of operation. Cumulative impacts on land ownership were minor, as the previous use of rangeland was resumed following construction, and easements affected different landowners: the DAPL Project easements were on private land, and the Project easement was on federal land. DAPL Project construction and restoration occurred within 1 mile of the Project Area.

Due to the narrow, linear design of the DAPL Project and the Project, pipeline construction had primarily a temporary to short-term, minor reduction in available forage and temporary restriction on livestock movement. DAPL Project pipeline construction could have caused soil compaction, erosion, the mixing of topsoil with subsoil and the introduction and spread of noxious weeds, which could have caused a temporary to short-term reduction in range productivity following construction activities. Dakota Access minimized these effects by implementing measures in its Erosion Control Plan and ECP. After the completion of construction, the work area was restored and ranching resumed over the operational right-of-way, grazing activities resumed, and landowners were compensated for the short-term loss of land and lower yields. As noted in Section 4.2.4, Vegetation and Noxious Weeds, vegetation in the Project Area appears to be in good condition following restoration.

The DAPL Project also resulted in the permanent loss of forage within the permanent access roadbed; however, there was no equivalent loss due to the Project that resulted in permanent cumulative impacts. Revegetation has been completed in the Project Area; therefore, the Project is no longer contributing to cumulative impacts on agriculture.

Combined impacts of the Project and the DAPL Project on agriculture remained temporary to short-term and minor as there would be a perceptible impact on the resource, but the impacts did not result in an overall change in resource character or value.

In conclusion, the past cumulative impacts on land use are not considered significant. No significant impacts occurred on recreation or special interest areas because they do not occur within the Project Area. No actions were identified that would contribute to future cumulative impacts on land use and recreation for the five alternatives within the geographic and temporal scope of this analysis.

4.2.7. Cultural Resources

The portion of the DAPL Project located within 1 mile of the Lake Oahe crossing (the Project Area) consisted of construction and restoration activities on private land; there were no construction or restoration activities on USACE land. The USACE, in consultation with the SHPO, determined that no historic properties were affected by the DAPL Project within the cumulative impact area (see Section 3.7, Cultural Resources).

No other projects have been identified within the geographic scope of this analysis for cultural resources that would involve ground disturbance that might occur within the same temporal and geographic scope as Alternatives 1 through 5. Therefore, there would be no cumulative impacts on historic properties.

4.2.8. Socioeconomics, Environmental Justice, and Health

The following actions may have affected or could affect socioeconomics, environmental justice, treaty rights, subsistence, and health within Sioux County and Census tracts CT9665 and CT204, which generally occur within Morton and Emmons counties:

- **DAPL Project construction, restoration, and operation**: DAPL Project construction and/or restoration occurred in areas adjacent to the Project Area at the same time of construction/restoration of infrastructure related to the Project. The DAPL Project has provided jobs and increased business and tax revenue in the area.
- **DAPL Optimization Project**: Dakota Access installed a new pump station facility consisting of up to 30,000 horsepower of electronically driven motors and pumps within the DAPL Project right-of-way about 17 miles from the Project in 2021. Construction activities contributed to a temporary increase in jobs and business revenue in the area.
- **Anpetu Wi Wind Farm**: SAGE Development Authority is planning a 235-megawatt wind farm on the Standing Rock Reservation outside of Fort Yates in Sioux County, North Dakota. Project funding is currently being secured.
- **Emmons-Logan Wind Project**: An approximately 64,563-acre wind project was constructed between 2019 and 2020 in Emmons and Logan counties about 20 miles from the Project. The project contributes to local landowner and tax revenue.
- **Emmons-Logan Transmission Line**: A 6.85-mile long, 230-kilovolt transmission line was constructed in 2019 in Emmons County. The line connects the Emmons-Logan Wind Project to the existing 230-kilovolt Heskett-Wishek Transmission Line. The project was projected to create 200 to 300 temporary construction jobs.
- **Montana-Dakota Utilities Co. Mandan to Ellendale Upgrade Project**: This is a 230-kilovolt electric transmission line upgrade in Morton and Emmons counties. Impacts from this project likely consist primarily of a temporary increase in jobs in the local area during construction.
- **Oliver III Wind Energy Center**: This is a 100-megawatt wind facility in Oliver and Morton counties consisting of up to 48 wind turbines and completed in January 2017. The project was anticipated to contribute to a temporary increase in local business revenue during construction and long-term increases in landowner and tax revenue.

4.2.8.1. Socioeconomics

Cumulative impacts on socioeconomics with the Project are likely to have occurred during construction and the first several years of operation. The actions above had short-term, minor to moderate impacts on the economy combined with considerable socioeconomic impacts from Project construction in providing jobs as well as increasing government and business revenue through taxes and the purchase of goods and services by the projects and employees. Within Morton, and Emmons counties, construction of the various wind projects also likely resulted in a minor to moderate increase in landowner revenue through easement agreements.

Alternative 1 would require extensive construction to remove the existing pipeline and restore the environment to its pre-existing condition. While the construction activities associated with the removal of the pipeline and restoration would create long-term and temporary jobs and increase local and state hospitality and tax revenues, the influx of workers could put a long-term strain on medical and emergency services. If DAPL Project is shut down, the corresponding reduction in oil production would have significant adverse effects on local, state, and regional economies through job cuts, along with lost tax revenue for various governmental entities (including Morton and Emmons counties) and Indigenous Peoples such as the Three Affiliated Tribes; lost royalty revenue for mineral rights owners; lost jobs in the upstream, midstream, and downstream oil and gas industry; as well as lost jobs in supporting industries such as local and state hospitality, offsetting the economic gains from spending on pipeline abandonment by removal. Given the beneficial economic impacts associated with the cumulative actions listed above, there would be no cumulative adverse impacts on the economy, and long-term minor cumulative beneficial impacts that would not be significant.

Under Alternative 2, the limited number of temporary jobs and local and state hospitality and tax revenue associated with pipeline abandonment in place at the Lake Oahe crossing would have a negligible benefit to the economy. The significant adverse effects from shutting down DAPL Project would be the same as for Alternative 1 Given the beneficial economic impacts associated with the cumulative actions listed above, there would be no cumulative adverse impacts on the economy, and negligible temporary cumulative beneficial impacts.

As discussed throughout Chapter 3, impacts associated with Alternatives 1 and 2 are likely to also include constructing and operating the North Bismarck Reroute (Alternative 5). See the discussion below for a combined impact determination with Alternative 5.

For Alternatives 3 and 4, with continued operation of the pipeline, the adverse socioeconomic impacts identified under Alternatives 1 and 2 would not occur and there would continue to be major beneficial socioeconomic impacts on Morton and Emmons counties through an increased tax base, landowner revenue, and employment. This would also lead to indirect benefits to the entire state economy. When combined with the other actions listed within the geographic and temporal scope, the overall long-term cumulative socioeconomic impacts with Alternative 3 would be significant and beneficial.

Under Alternative 5, a portion of the North Bismarck Reroute would be constructed in Emmons County, which is within the geographic scope of this analysis. As such, construction and operation of the pipeline, abandonment (in place or by removal) of the existing pipeline where it crosses Emmons and Morton counties, and the temporary use of truck and rail could result in cumulative impacts with the Optimization

Project, Emmons-Logan Wind Project and Transmission Line, Emmons-Logan Wind Transmission Line, and Montana-Dakota Utilities Co. Mandan to Ellendale Upgrade Project.

The construction and abandonment (in place or by removal) activities associated with Alternative 5 would create short-term jobs, an increase in local spending, and an increase local and state hospitality and tax revenues, resulting in a beneficial cumulative impact with the actions listed above on the local and state economy. The influx of workers could put a temporary strain on housing as well as on medical and emergencies services. The Bismarck region has adequate hospitality and public services to meet the potential needs of non-local workers who would relocate temporarily, and community services would be supported by additional tax revenues generated by the North Bismarck Reroute. The use of trucking and rail could increase shipping costs for area farmers in the short-term. Construction for most of the actions listed above would likely be completed before Alternative 5 would be implemented (see Table 4.1.3-1); therefore, impacts on local services and shipping costs would not likely overlap, and there would be no associated adverse cumulative impacts on socioeconomics. Operation of the North Bismarck Reroute would return crude oil transportation in North Dakota to its current baseline condition and, as such, the beneficial impact on local and state economies would continue through the restored tax base, landowner revenue, and employment. Given their beneficial economic impacts the actions listed above would not contribute to cumulative adverse impacts on the economy but would contribute to moderate short-term to permanent cumulative beneficial impacts.

While shutting down the pipeline would have a short- to long-term, significant adverse effect on the economy of North Dakota and the local counties, the implementation of Alternative 5 could discontinue some of the adverse effects by creating a new permanent mode of transportation. Construction activities of Alternative 5 in combination with Alternative 1 or 2 would have a short-term, minor to moderate beneficial impact on the economy. The actions listed above, when considered cumulatively with Alternative 5 in combination with Alternatives 1 or 2, would contribute to continued minor to moderate short-term beneficial economic impacts during Project construction and would not contribute to the overall significant adverse economic effects.

4.2.8.2. Environmental Justice, Treaty Rights, Subsistence, and Health

Cumulative impacts related to environmental justice as a result of the Project combined with the actions described above are unknown because environmental justice reviews were not identified in the publicly available information associated with any of the above actions.

Construction activities from the Project and the above actions may have had a temporary, minor impact on subsistence resources and associated tribal treaty rights due to noise, lighting, and general human presence, which would have caused game species to temporarily disperse or be unavailable. Similar cumulative future impacts could occur from implementation of Alternatives 1 through 5. However, the actions listed above primarily occur on private land where subsistence resources are less accessible. Therefore, cumulative impacts on subsistence and treaty rights would be negligible and not significant.

Past temporary, minor cumulative impacts on health from the above actions and the Project could have occurred as a result of accidents and injuries during construction. No actions have been identified that would contribute to future cumulative impacts on health due to accidents and injuries or other causes for the five alternatives within the geographic and temporal scope of this analysis.

4.2.9. Transportation and Traffic

The DAPL Project may have increased traffic occurring along ND Highway 1804, ND Highway 1806, and/or the Northern Border access road. DAPL Project construction and restoration occurred in areas adjacent to the Project Area at the same time as construction and restoration of infrastructure related to the Project. No road closures occurred for construction vehicles for the DAPL Project or Project.

As a result, cumulative impacts with the Project are likely to have occurred during construction and the first several years of operation. The combined traffic from the DAPL Project and the Project increased traffic on ND Highways 1804 and the Northern Border permanent access road. The Project and DAPL Project implemented traffic mitigation measures and adhered to applicable regulations and limited lane closures, and there were no closures or major traffic disruptions on these roads due to construction traffic. Overall, the combined impacts on transportation and traffic from construction activities were temporary, minor to moderate, and not significant since roads were still accessible for the local community. Given the negligible impacts on traffic associated with the existing DAPL Project during operation, additional cumulative impacts are not anticipated under Alternatives 3 and 4.

No other actions were identified that would contribute to cumulative transportation impacts for the five alternatives within the geographic and temporal scope of this analysis.

4.2.10. Hazardous Waste

The only action that could contribute to cumulative impacts from hazardous waste within 1 mile of the Project Area would be the DAPL Project. No hazardous waste incidents were reported as a result of DAPL Project and Project construction and operation within 1 mile of the Project Area. Hazardous waste sites are not known to occur within the Project right-of-way (see Section 3.10, Hazardous Waste). Therefore, the Project has not contributed to cumulative impacts.

No actions were identified that would contribute to future cumulative impacts due to hazardous waste for the five alternatives within the geographic and temporal scope of this analysis.

4.2.11. Air Quality and Noise

4.2.11.1. Air Quality

DAPL Project construction and crop cultivation could have affected air quality within 0.25 mile and 30 miles of the Project Area for construction and operation, respectively. Vehicle and equipment emissions from DAPL Project construction and crop cultivation could have contributed minor impacts on air quality. A minor amount of vehicle emissions associated with any intermittent pipeline maintenance activities and crop cultivation could occur during DAPL Project operations.

Based on dispersion, construction air emission impacts were typically highly localized and did not travel more than 0.5 mile from the construction area. Intermittent vehicle emissions for DAPL Project and Project maintenance activities was also highly localized and minor. Therefore, the air emissions associated with the DAPL Project and Project construction, crop cultivation in the area, and the first several years of operation did not have a significant cumulative adverse effect on air quality or visibility in the region. Given the negligible impacts on air quality associated with these actions and the Project during operation, negligible additional cumulative impacts would occur under Alternatives 3 and 4.

Crop cultivation has occurred in the area for some time and is considered part of the baseline air quality.

4.2.11.2. Noise

DAPL Project construction, restoration, and operation in areas adjacent to the Project Area at the same time of construction and restoration of infrastructure related to the Project may have contributed or could contribute to noise within 1 mile of the Project Area. The DAPL Project generated noise from vehicles and equipment during pipeline construction and will have intermittent, negligible noise impacts from maintenance vehicles driving along the permanent access road to the valve site.

Cumulative impacts due to noise from the DAPL Project and the Project temporarily affected noise levels at four NSAs within 1 mile of the Project Area. Based on an analysis of the HDD activities, Project construction resulted in a temporary, minor to moderate noise impacts at nearby NSAs and were not significant. Although noise from DAPL Project construction apart from the Lake Oahe crossing could have been moderately loud, the temporary and intermittent nature of pipeline construction activities would not have resulted in long-term cumulative impacts. Additionally, non-HDD construction activities are generally limited to daylight hours in conformance with federal, state, and local codes and ordinances, and manufacturer-prescribed safety procedures and industry practices. Therefore, past cumulative impacts on NSAs due to noise from would have been temporary and minor to moderate, and these impacts would not have been significant.

No actions were identified that would contribute to future cumulative impacts due to noise for the five alternatives within the geographic and temporal scope of this analysis.

4.2.12. Climate Change

Climate Change is inherently a cumulative impact issue and is addressed in Section 3.12, Climate Change.

5. CONCLUSIONS

Following issuance of the 2016 EA and the USACE completion of the Remand Analysis on August 31, 2018, the U.S. District Court for the District of Columbia ordered the USACE to prepare an EIS on March 25, 2020, for the crossing of Lake Oahe because this portion of the pipeline's "effects on the quality of the human environment are likely to be highly controversial."

This EIS addresses the District Courts order, updates the impact analysis from the 2016 EA and Remand Analysis on all resources, and addresses climate change and GHG emission impacts (which were not included in the 2016 EA). The impact assessments are based on the actual impacts that occurred from construction and operation to date, and potential future impacts that could occur as a result of Alternatives 1 through 5.

The following sections summarize Project impacts and cumulative impacts on resources to date; and potential future impacts and cumulative impacts, categorized by Alternative. Mitigation measures (to date and proposed under the Alternatives) are presented in Chapter 2, Alternatives, and in individual resource sections where relevant.

5.1. Summary of Construction and Operational Impacts to Date

Based on the 2016 EA and Remand Analysis, Dakota Access constructed and has operated the pipeline for nearly 6 years with the incorporation of the environmental requirements and original easement conditions into all construction specifications; to date, there has been no release along the pipeline's main line.

The ECP was included in contract documents and enforced as such throughout construction. Construction contractors were required to comply with all applicable permits and plans during all phases of construction. In addition to the ECP, the Applicant Proposed Action was implemented in accordance with the measures detailed in Dakota Access' SWPPP, SPCC, HD Construction Plan, HDD Contingency Plan, and UDP (all provided as attachments to the EA [USACE, 2016]).

To further ensure compliance with permits, plans, obligations, and commitments, Dakota Access required that full-time Environmental Inspectors monitor construction and compliance activities. The Environmental Inspectors were responsible for observing construction activities to verify that work was completed in accordance with environmental permit requirements and to ensure that designed avoidance and mitigation measures were properly executed during construction. Dakota Access continues to comply with all easement conditions to date, as documented and provided to the USACE. Further, additional enhanced safety systems and additional monitoring measures at the Lake Oahe crossing beyond those included in the easement conditions have been identified by Dakota Access. There have been no releases from the DAPL Project mainline, although eight minor (documented) release incidents have occurred from aboveground DAPL Project facilities outside the Applicant Proposed Action area, as described in Section 3.1.3, [Reliability and Safety] Dakota Access and Energy Transfer Safety Record.

Impacts on all resources from construction and operation to date were temporary to short-term, negligible to minor, localized, and not significant, except for socioeconomics and climate change.

The DAPL Project overall created about 12,000 construction jobs. These construction jobs were estimated to have created considerable labor income and state income tax revenue. Based on the estimate of the 2020 tax revenue, Morton and Emmons counties received approximately $1,789,914 in ad valorem taxes from operation of the DAPL Project. Given that the Lake Oahe crossing was constructed as part of the DAPL Project, impacts on the economy and employment from the construction of the Lake Oahe crossing, specifically, are unknown.

Regarding the evaluation of potential impacts of the Project on climate change, there is currently no universally accepted methodology to attribute discrete, quantifiable, physical effects on the environment, to the Project's incremental contribution to GHGs.

Chapter 4 presents cumulative impacts that did occur or could have occurred to date due to past actions combined with construction of the Project. The following past actions were evaluated (see Section 4.1.3, [Cumulative Impacts] Step 3: Identify Past, Present, and Reasonably Foreseeable Future Actions, for details): crude oil transport as part of the entire DAPL Project; wind energy and electric transmission line projects in Morton, Emmons, and Oliver counties; and local and regional agricultural activities. Past cumulative impacts on all resources are summarized below.

Cumulative impacts on soils, water resources, vegetation, noxious weeds, and land uses from the Project and DAPL Project included the following: soil and vegetation compaction; erosion into wetlands and waters due to grazing; vegetation removal during construction (including rangeland forage); the spread of noxious weeds; and the temporary exclusion of livestock from construction areas. With implementation of the ECP, including revegetation, weed control, and soil erosion control measures, and given the available adjacent vegetation and rangeland, impacts on the resources described above were temporary to short-term, minor to moderate, and not significant.

Temporary cumulative impacts could have occurred on wildlife due to lighting, noise, and human presence in the construction areas. The same impacts may have affected the federally listed piping plover, least tern, whooping crane, and rufa red knot. However, given the temporary nature of these impacts along with abundant adjacent habitat, impacts were temporary, minor, and not significant.

No cumulative impacts were identified for the following resources because no other past actions were identified that would have caused cumulative effects for these resources: cultural resources, hazardous waste, and reliability and safety.

Numerous additional actions may have contributed to a cumulative positive impact on socioeconomics due to temporary construction and other permanent jobs, and/or increased tax and business revenue from the purchases of goods and services (DAPL Project; Optimization Project; and various wind and transmission lime projects in the region). Economic impacts associated with these projects were minor to moderate, temporary, and not significant. Construction activities from the Project and the above actions may have also had a short-term, minor cumulative impact on subsistence resources due to noise, lighting, and general human presence. Based on the assessment, past cumulative impacts on socioeconomics and subsistence are not considered significant. Cumulative impacts related to environmental justice as a result of the Project, combined with the actions described above, are unknown as environmental justice reviews were not identified in the publicly available information associated with any of the above actions.

Cumulative transportation and traffic impacts affected ND Highway 1804, ND Highway 1806, and/or the Northern Border access road during construction. Dakota Access implemented traffic mitigation measures and adherence to applicable regulations and limited lane closures for the Project and DAPL Project. Overall, the impacts on transportation and traffic on the Project Area during construction were temporary and minor to major, but not significant because roads were still accessible for the local community. During operations, the pipeline had a moderate beneficial impact by eliminating the need for tanker trucks and trains to transport the crude oil through the region, which avoids associated wear and tear and decreased traffic on public roads and rail. Cumulative emissions from vehicles and other sources may have caused a minor reduction in local air quality during construction. Impact levels would have been minor, temporary, and not significant.

The Project and DAPL Project could have resulted in a cumulative increase in noise levels at four NSAs within 1 mile of the Project Area. Based on an analysis of the HDD activities for the Project and typical construction noise for other pipeline projects, impacts would have been temporary, moderate, and not significant.

Construction of the DAPL Project pipeline and the wind and transmission line projects resulted in the short-term cumulative generation of GHG emissions. Normal operation of the pipeline across Lake Oahe does not generate direct GHG emissions, with the exception of a small amount associated with periodic pipeline maintenance activities.

5.2. Alternative 1 Impact Summary

Under Alternative 1, approximately 7,500 feet of the 30-inch diameter pipeline within the Project Area would be abandoned by removal, of which approximately 5,420 feet is beneath Lake Oahe. The pipeline is buried approximately 95 to 126 feet below the bottom of Lake Oahe. Under this alternative, the pipeline would be removed through excavation within Lake Oahe and the adjacent areas, which would require substantial dewatering in some areas (e.g., temporary damming, sheet piling, or pumping/diversion) to create a workspace. In addition, excavation between 4 and 126 feet onshore and excavation between approximately 95 to 126 feet beneath Lake Oahe to reach the pipe would be required. Given the depth of the pipeline, length of pipeline to be removed, construction technique/methodology to remove the pipeline, workspace requirements, and equipment that could perform such excavation and hauling of material, it is estimated that removing the pipeline would take 6 to 20 years or more to complete.

Because the pipeline would be abandoned by removal, Alternative 1 would have no operating impacts on resources except for socioeconomics.

In addition, if Alternative 1 is adopted and an easement is not granted, Dakota Access would likely seek to construct and operate a pipeline reroute, which would result in direct and indirect effects on the environment. This EIS analyzes the North Bismarck Reroute, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 1 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

Impacts from Alternative 1 on resources that may be moderate-to-major, long-term, and/or widespread are discussed in the following subsections.

5.2.1. Reliability and Safety

Under Alternative 1, impacts from a release during construction could occur as the pipeline would need to be drained, excavated, and taken apart into segments. During this construction activity, there is risk of residual hydrocarbon release into the environment, which could result in the need for cleanup operations during and after removal. Should a release occur during removal activity, impacts from Alternative 1 are estimated to be minor to moderate, and short-term as the construction activities would have noticeable but isolated and reversible impacts on the environment. As a result, impacts of Alternative 1 are not expected to be significant.

5.2.2. Geology and Soils

Alternative 1 would involve major earthwork and engineering to remove the constructed pipeline. Dakota Access has determined that lake flow would need to be diverted, and excavation of approximately 77 acres of the lake bed in two phases would be required. This would result in a total of an estimated 12.3 million cubic yards of excavated material. Storage of the spoil would require approximately 1,400 acres of land disturbance in upland areas adjacent to the lake. In addition, the required excavation would undermine the integrity of Northern Border's two pipeline crossing of Lake Oahe, which is within 100 feet parallel to the Dakota Access pipeline. These activities would also require relocation.

If adopted, Alternative 1 would have a long-term to permanent effect on geology; these impacts are anticipated to be a major alteration of the resource character, resulting in significant impacts. Long-term, moderate impacts on soil resources are also anticipated under Alternative 1, but these would not be significant.

5.2.3. Water Resources

Removing the pipeline under Alternative 1 would involve constructing an approximately 3,400-foot-long cofferdam across half of the lake, removing the exposed portion of pipe, backfilling, and then repeating the effort on the remaining half of the lake with an approximately 2,500-foot-long cofferdam. Excavation, backfilling, construction traffic, and excavation stockpiling would result in long-term (potentially decades) impacts on water quality (e.g., elevated turbidity) and increased potential for an accidental release of contaminants from equipment. Results of a sediment transport modeling analysis for dewatering the cofferdams indicate that sediments could travel 160 miles downstream despite the use of mitigative measures. These moderate impacts combined with the long-term duration would result in impacts on water quality and surface water intakes that would not be significant.

Dewatering activities within the cofferdams have the potential to lower the surrounding local groundwater levels, which directly interact with water levels within Lake Oahe. The potential long-term, minor impacts on groundwater would not be significant.

The excavation of the pipeline under Lake Oahe would consist of a 77-acre footprint with an additional approximately 1,400 acres of uplands to temporarily store material onshore. The hypothetical spoil storage locations would potentially impact NWI mapped wetlands, which are approximately 4.2 acres in size, and a mapped pond approximately 0.6 acre in size. This would result in a long-term, minor impact on wetlands that is not significant.

Both sides of Lake Oahe are labeled by FEMA as Zone D, which means possible flood hazard areas within the Project Area, although a detailed analysis has not been conducted. Review of the North Dakota Risk Assessment map service indicates that the 500-year flood risk on the west side of Lake Oahe extends into adjacent drainage areas that cross the Project workspace, and approximately 400 feet of Project workspace on the east side (NDRAM, 2023). Possible floodplains and the Project workspace overlapping the 500-year flood risk zone on both sides would be impacted by spoil storage area and access roads, which would compact soil and reduce water infiltration for the long-term duration of the pipeline removal. Based on existing floodplain mapping and impacts being limited to access roads and temporary spoil storage areas, the potential impact on floodplains is long-term, minor, and not significant.

5.2.4. Vegetation and Noxious Weeds

Alternative 1 would require excavating an estimated 77 acres of Lake Oahe and an estimated 1,400 acres of adjacent uplands for the storage of spoil material. Therefore, the direct impacts on vegetation in the permanent right-of-way and construction workspace due to excavation and spoil storage is expected to be long-term (6 to 20 years), but localized to the right-of-way and construction workspaces. All areas of ground disturbance would be revegetated with a native seed mix and monitored with the goal of revegetating the existing grassland/herbaceous vegetation to a minimum of 70 percent cover. Successful revegetation to the performance standard would be expected to take a minimum of 2 to 3 years. This long-term but localized, moderate impact on vegetation would not result in significant impact on vegetation.

Dakota Access would implement weed management measures proposed in the ECP (Appendix G of the 2016 EA); however, the long-term disturbance caused by Alternative 1 during construction is expected to cause a localized, short- to long-term, moderate impact associated with the spread and establishment of noxious weeds. Although the geographic scope is considered “localized,” once established, weeds could be reasonably expected to extend to and impact native vegetation adjacent to the construction area. The duration of impact (short- versus long-term) would depend on the noxious weed species and the extent of establishment. Given the possibility of a larger geographic scope and possible long-term duration, the overall impact intensity is considered moderate but not significant.

5.2.5. Wildlife and Aquatic Resources

Alternative 1 would require extensive dredging to remove the pipeline from under Lake Oahe and approximately 1,400 acres of additional staging area for spoil storage in terrestrial habitat adjacent to the river. The level of ground disturbance in the spoil storage area would result in the displacement of wildlife species during removal activities to nearby suitable habitat, injury or mortality of burrowing species, temporary loss of herbaceous habitat, and increased noise and lighting for 6 to 20 years or more. Following construction, terrestrial habitat would likely be restored within two to three seasons, and local populations of wildlife would be expected to recover within a similar timeframe. Therefore, wildlife impacts from Alternative 1 would be short- to long-term, and major, but would not result in significant impacts on terrestrial habitat.

Pipeline removal would involve a high level of water and soil disturbance over 6 to 20 years or more. Removing the pipe would involve the construction of cofferdams that would allow the river to continue flowing on one side of the channel while excavation takes place on the other side. Accessing the pipe under Lake Oahe would also require dredging the lakebed above the pipeline.

These activities would result in impacts on aquatic resources that would include high-intensity degradation of aquatic habitat for at least several years, including temporary removal and mixing of benthic sediments, increased turbidity, resuspension of contaminants in the water column, and increased sedimentation. As a result, direct and indirect impacts from pipe removal on aquatic organisms would be short- to long-term, and major. These impacts would be significant as they would likely result in local mortality of aquatic organisms over multiple years due to physical injury from equipment and habitat disturbance.

Regarding threatened and endangered species, removal of the pipeline could have a significant impact on two federally listed species (the pallid sturgeon and piping plover) and a critical habitat (piping plover critical habitat) given the USFWS's *likely to adversely affect* determination for these species.

Alternative 1 would likely affect piping plover through displacement of individual birds, potentially during the nesting season, resulting in abandonment of young or eggs. Excavation in Lake Oahe could also damage piping plover sandbar and mudflats in critical habitat in the affected area. Alternative 1 is *likely to adversely affect* piping plover and piping plover critical habitat.

Alternative 1 *may affect and is likely to adversely affect* the northern long-eared bat due to potential impacts on their habitat, noise and lighting disturbances, and a reduction of prey abundance.

Noise disturbances for Alternative 1 are described as short-term and *may affect, but are not likely to adversely affect* the rufa red knot and whooping crane. Given the abundant prey habitat upstream and downstream from the Lake Oahe crossing, indirect impacts on bald and golden eagles would be negligible and not significant.

5.2.6. Land Use and Recreation

Under Alternative 1, Dakota Access would acquire a temporary construction easement on federal and private property to perform the associated construction activities. These easements would limit the activities landowners could perform during the time of construction. These impacts would only apply to the area under the construction easement (which would be larger than the original easement), and the landowners would still be able to use land outside of the easement as they did prior to the start of construction. The construction under Alternative 1 could last 6 to 20 years or more, and Alternative 1 would have long-term and moderate impacts on land ownership, which would not be significant.

Depending on the method used to extract the pipeline, Alternative 1 would potentially require excavation and dredging with spoil storage, requiring approximately 1,400 acres of prime farmland and land used for livestock grazing and ranching. As such, Alternative 1 would result in short- to long-term and major impacts on livestock grazing and movement from the length of time it would take for pipeline removal and complete restoration of the area. The new access roads in the area may be temporarily affected or used during construction under Alternative 1, although roads would be restored to pre-impact condition following construction. Regardless, the impacts on livestock grazing would result in significant land use impacts.

Similarly, excavation and dredging to extract the pipeline would result in short- or long-term and moderate impacts on recreation, as dredging would disrupt hunting and wildlife viewing for an extended period of time. Alternative 1 would also result in short-term and moderate impacts on recreational activities on Lake Oahe such as boating, which would be restricted in the area of pipeline removal. Lake Oahe is approximately 231 miles long with the Applicant Proposed Action confined to one end of the lake; therefore, restriction to boating and recreational uses would not be disruptive to the overall use for the lake. Additional impacts on existing boat ramps and lake access points from the construction resulting from Alternative 1 could occur. However, these impacts would not be significant.

5.2.7. Socioeconomics, Environmental Justice, and Health

Construction activities associated with the abandonment activities of removing the pipeline and restoration under Alternative 1 would create temporary jobs and increased local and state hospitality and tax revenues. No permanent jobs would be created. Depending on the size of the workforce, the influx of workers could put long-term strain on housing and medical and emergencies services. Based on a March 2021 North Dakota legislative revenue forecast, should the pipeline be shut down under Alternative 1, numerous economic impacts would be incurred by upstream and downstream customers; and thousands of lost jobs would occur. These economic impacts include $3.81 billion to $5.95 billion in revenue losses caused by the shut-in of wells and production; millions of dollars in property tax losses in several states; lost oil and gas tax revenue; and capital costs and losses due to binding contractual commitments. The State of North Dakota provided additional input identifying a loss of $2 billion in tax revenue over a 2-year budget period would constitute a 20 percent decline in the state’s general fund revenues. Funding allocated by the state to cities, counties, tribal government, public schools, social services, and essential infrastructure would be substantially reduced. These impacts are further exacerbated in the current economic climate that has resulted from the pandemic. These effects would persist for at least as long as an alternative pipeline were not fully operational. As such, Alternative 1 would have long-term to permanent and major impacts, and it may result in significant adverse socioeconomic impacts.

Alternative 1 would also have an indirect effect on tribal oil and gas extraction. The MHA Nation estimates revenue loss that would exceed $160,000,000 over a 1-year period.

The SRST and the CRST are considered environmental justice communities near the Applicant Proposed Action Project area. They rely on their treaty rights and subsistence practices and may be subject to disproportionate health effects. Regarding subsistence resources, damming and dredging activities associated with Alternative 1 may have short- to long-term effects on aquatic resources at the crossing location and downstream and potential changes to harvest location and harvest abundance over multiple harvest seasons, representing a long-term impact of moderate intensity. Therefore, Alternative 1 would result in significant impacts on subsistence and associated tribal treaty rights, and therefore result in significant impacts on environmental justice communities. However, impacts on health are not expected to be significant.

Alternative 1 would have short- to long-term major impacts on the health of community members due to the potential reduced nutritional intake from the reduced availability of subsistence resources at the crossing location, and minor impacts from increased road traffic that could increase the risk of vehicular accidents. The impacts on food acquisition and nutritional intake could be significant.

Alternative 1 would also have indirect effects on tribal oil and gas extraction. Approximately 80 percent of the MHA Nation's budget is derived from oil production and based on their calculations, the estimated revenue loss would exceed $160,000,000 over a 1-year period with annual health insurance costs totaling about one quarter of this amount. The oil tax and revenue funds are used by the MHA Nation for programs such as drug enforcement, health clinics, health insurance, child and elder care services, and emergency management centers.

5.2.8. Hazardous Waste

Alternative 1 would have short-term to long-term impacts depending on volume of waste generated and the rate of waste characterization, summarization, and transportation to the disposal facility. Alternative 1 would have a moderate impact due to the complexity of managing large volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste.

Transportation considerations such as the mode of transporting each waste (e.g., rail, truck) would need to be identified. This would include provisions for truck entry onto the site to pick up the material; oversite by personnel to provide appropriate documentation; appropriate required training for personnel that would be signing a hazardous waste manifest; and necessary placards or labels for the trucks that would be carrying hazardous waste.

In conclusion, removal activities for abandonment of the pipeline associated with Alternative 1 would not result in significant impacts from hazardous waste.

5.2.9. Air Quality and Noise

Implementation of Alternative 1 would result in the short-term generation of construction emissions. Construction activities to remove the pipeline would occur over 6 to 20 years or more and require the amount of workspace similar to the construction of 120 miles of the Applicant Proposed Action. Based on the amount of work required, including site preparation, dredging, spoil storage and disposal, and restoration, the amount of direct construction emissions associated with Alternative 1 would be considerably larger than the emissions associated with the original pipeline construction. This increase in criteria pollutant emissions and HAPs during construction would result in a long-term, moderate impact on air quality in the vicinity, would not impact air quality or visibility in the region, and would not result in a significant impact.

There would be no direct ongoing operational noise associated with Alternative 1. Alternative 1 would cause short-term increases in ambient sound levels in the area immediately surrounding construction activities. Alternative 1 would likely be similar in scale to the sound levels associated with the original pipeline HDD; however, the impacts on any of the nearby NSAs would be longer in duration than the original pipeline HDD installation, but likely limited to daytime hours. This increase in ambient noise would result in a long-term, minor impact on sound levels in the vicinity that is not considered significant.

5.2.10. Climate Change

Implementation of Alternative 1 would result in the long-term generation of increased GHG emissions during the 6 and 20 plus years required to remove the pipe. Based on the amount of work required, including site preparation, dredging, spoil storage and disposal, and restoration, the amount of direct GHG emissions associated with Alternative 1 would likely be considerably larger than the GHG emissions associated with the original pipeline construction. GHG emissions associated with Alternative 1 would be in addition to GHG emissions from constructing and operating the North Bismarck Reroute. See Section 5.5 for a discussion of Alternative 5.

5.2.11. Cumulative Impacts

As discussed in Chapter 4, Alternative 1 would not have any cumulative impacts on the following resources:

- geology
- soils
- water resources
- aquatic resources
- threatened and endangered species
- recreation
- special use areas
- cultural resources
- socioeconomics, environmental justice, treaty rights, subsistence, and health
- transportation and traffic
- hazardous waste
- reliability and safety
- air quality
- noise

The ground disturbance associated with Alternative 1 combined with the DAPL Project and livestock grazing could contribute to a cumulative increase in noxious weed distribution, also affecting agricultural land use through reduced rangeland quality. Revegetation, soil mitigation, and weed control measures would make these impacts not significant, short- to long-term, and moderate.

Spoil piles from dredging for Alternative 1 along with impacts from the DAPL Project and grazing would contribute to a cumulative reduction in the quality and quantity of wildlife habitat. Habitat restoration and the abundance of adjacent suitable habitats would make these impacts not significant, minor, short-term.

5.3. Alternative 2 Impact Summary

Under Alternative 2, the USACE would not grant an easement to cross the federal property at Lake Oahe, and the 7,500 feet of pipeline within the Applicant Proposed Action area would be abandoned in place and not used. Impacts on all resources would be temporary to long-term, and negligible to minor, except for socioeconomics. Therefore, Alterative 2 would not result in significant impacts on these resources.

As discussed above with respect to Alternative 1, Alternative 2 would result in a negative impact on socioeconomics on a statewide and regional level. Based on a March 2021 North Dakota legislative revenue forecast, numerous economic impacts would occur, including $3.81 billion to $5.95 billion in revenue losses caused by the shut-in of wells and production; millions of dollars in property tax losses in several states; lost oil and gas tax revenue; capital costs and losses due to binding contractual commitments would be incurred by upstream and downstream customers; and thousands of lost jobs. Impacts on socioeconomics under Alternative 2 would be major and long-term to permanent, resulting in a significant adverse impact.

If Alternative 2 is adopted and an easement is not granted, Dakota Access would also likely seek to construct and operate a pipeline reroute, which would result in direct and indirect effects on the environment. This EIS uses the North Bismarck Reroute as a proxy for a reroute and the associated abandonment of the existing pipeline, which is further discussed under Alternative 5. Therefore, impacts associated with Alternative 2 also include constructing and operating the North Bismarck Reroute. See the discussion below under Alternative 5 for a combined impact determination.

5.4. ALTERNATIVES 3 AND 4 IMPACT SUMMARY

Under Alternative 3, the USACE would grant the requested easement to cross federal property with the same conditions as the previous easement, allowing for the operation, maintenance, repair, replacement, and termination of the existing 30-inch diameter buried pipeline and the continued transport of crude oil from North Dakota to Illinois.

Alternative 4 is similar to Alternative 3 as the USACE would grant the requested easement; however, the easement would be granted with additional conditions, as listed in Section 2.6.2, Alternative 4: Grant Requested Easement with Additional Conditions.

Dakota Access developed two modeling reports presenting the results of 1,160 modeling runs covering various environmental conditions for the impacts of a WCD. Of these modeling simulations, 18 representative scenarios were selected considering mitigated and unmitigated responses, high and low river flow conditions, ice coverage conditions, storm conditions, FBRs under Lake Oahe with all oil that is released immediately entering the water (ignoring the 90 plus feet of sediment between the lake and the pipeline), and releases onshore from a valve site where oil could travel overland to reach Lake Oahe and enter the water. Overall, most resources could experience moderate to major and short- to long-term impacts from any of the potential WCD crude oil release scenarios modeled. However, analysis of incident and frequency data and a review of existing pipeline safeguards indicates that the *likelihood* of a WCD occurring is approximately 1-in-1,000,000 years (remote) to 1-in-100,00 years (very unlikely). Therefore, while the magnitude of impact could be moderate to major *if* a release occurred, the overall risk from a WCD release on most resource is negligible to minor, given the low likelihood and the fact that reliability and safety safeguards are in place to prevent, respond to, mitigate, and remediate releases of crude oil into the Applicant Proposed Action area.

Impacts on resources that are likely to be moderate-to-major, long-term, and/or widespread are discussed in the following subsections below.

5.4.1. Reliability and Safety

Potential hazards associated with granting the easement under Alternatives 3 and 4 would be associated with a crude oil release during continued operations, should one occur. The transport and fate of contaminants from a WCD crude oil release at or adjacent to Lake Oahe under Alternatives 3 and 4 were evaluated based on the crude oil consequence modeling of a FBR from two locations: the ND-380 valve site and a hypothetical pipe at the bottom of Lake Oahe. Based on this evaluation, harmful crude oil constituents could affect the water surface, water column, and shoreline of Lake Oahe and the Cannonball River at varying distances and concentrations. However, based on historic pipeline data, the likelihood of an FBR at a pipeline or valve was determined to be remote to very unlikely, respectively.

Unmodeled discharge scenarios were also be evaluated, including a slow or rapid release of crude oil beneath Lake Oahe and a slow release at the ND-380 valve site. The likelihood of a slow release from the ND-380 valve site and pipeline was determined to be remote to unlikely. While the slow-release valve site scenario is more likely than an FBR, impacts would likely be lower (minor) based on slower release rates and the quantity of oil reaching the surface, therefore presenting a minor risk to sensitive resources.

Granting the easement under Alternative 3 would not involve any changes to the pipeline or aboveground facilities; as such, the reliability and safety determinations for the pipeline at the Lake Oahe crossing would remain the same. Under Alternative 4, increased mitigation measures, more advanced leak detection and protection tools, and more stringent conditions would further increase the reliability and safety of the pipeline.

5.4.2. Geology and Soils

Alternatives 3 and 4 would result in no additional construction impacts on geological resources beyond the temporary, minor impacts from ground disturbance and vibrations from the HDD process in 2018. In addition, no disturbance to geological resources from routine operation and maintenance of the buried pipeline would be anticipated. Temporary to long-term, minor to major impacts could occur on geological and soil resources from excavation of contaminated soils should a WCD crude oil release occur adjacent to or under Lake Oahe. Because the potential for a WCD crude oil release is considered remote to very unlikely, the overall risk to geologic resources and soils ranges from negligible to moderate, and these alternatives are not expected to have significant impacts.

Granting the easement under Alternatives 3 and 4 would also not result in any additional construction impacts on soils beyond the temporary, minor impacts from ground disturbance on adjacent property during construction in 2018. In addition, no disturbance to soils, including prime farmland from routine operation and maintenance of the buried pipeline would be anticipated.

Granting the easement under Alternatives 3 and 4 would result in a low risk of minor structural impacts on the pipeline from seismic, landslide, and subsidence hazards that would not be significant.

5.4.3. Water Resources

Alternatives 3 and 4 would result in no additional construction impacts on surface waters. Should a crude oil release occur adjacent to or under Lake Oahe, temporary to long-term, minor to moderate impacts could occur on water quality and temporary to long-term, moderate to major impacts on agricultural and drinking water intakes in Lake Oahe and its tributaries due to degraded water quality. Because the potential for a WCD crude oil release is considered remote to very unlikely and the resultant risk is negligible to moderate, these alternatives are not expected to have significant impacts.

The greatest risks on surface water posed by a release are to the water intake structures, specifically the South Central Regional Water District Intake (#5) and the Standing Rock Sioux Tribe Drinking Water Intake (#14), which are about 11 and 75 miles downstream of the Lake Oahe crossing, respectively. A WCD crude oil release under Alternatives 3 and 4 could result in a maximum modeled downstream extent of surface crude oil of about 65 miles, which is 10 miles upstream of the tribal drinking water intake (#14), but would reach the South Central Regional Water District Intake (#5). In addition, predicted contamination for dissolved hydrocarbon concentrations in the water column could extend farther than surface thickness. However, concentrations decrease in the water column as depths increase. Therefore, concentrations may be high in near-surface waters, but low at the intake depth. Water intakes placed at depths below 32.8 feet, such as the Standing Rock Sioux Tribe Intake (60 to 80 feet deep) would not likely be affected. A WCD would also impact other water intakes used for agricultural purposes. Impacts on water intakes could be temporary to long-term and moderate to major depending on the depth of the intake, how long the intakes are offline, and the implementation of mitigation measures. Although these consequences could be minor to major, the likelihood of their occurrence is remote to very unlikely and the overall risk to water intakes would not be significant.

Alternative 4 includes an additional easement condition requiring Dakota Access to develop a plan for supplying an alternative source of clean, safe water to any affected water intake users for agricultural applications and drinking water in the event a crude oil release should occur at the Lake Oahe crossing until the release is cleaned up and water at the intake is clean and safe for the applicable uses. This would minimize the potential impact of a crude oil release even further.

Alternatives 3 and 4 would result in no additional construction impacts on groundwater. In addition, no impacts on groundwater under routine operation and maintenance of the buried pipeline would be expected to occur. Should a WCD crude oil release occur adjacent to or under Lake Oahe, temporary, minor impacts (e.g., from a shallower release) to long-term, major impacts (e.g., from a deeper release) could occur should groundwater be contaminated. As the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts. To further reduce the impacts of a crude oil release, Alternative 4 includes a new easement condition 4 that Dakota Access shall install a groundwater monitoring network within surficial aquifers connected to Lake Oahe to monitor for the presence of petroleum-based hydrocarbons, and make sampling results publicly available online and to the USACE, the NDDEQ, and interested Tribes.

Under Alternatives 3 and 4, no impacts on wetlands from routine operation and maintenance of the buried pipeline would be expected. Should a WCD crude oil release occur adjacent to or under Lake Oahe, long-term, moderate impacts could occur on up to 268 mapped NWI wetlands (approximately 2,507 acres) that are adjacent to the shoreline. As the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

5.4.4. Vegetation and Noxious Weeds

Alternatives 3 and 4 would result in no additional construction impacts on vegetation or associated with noxious weed spread and establishment beyond the short-term, minor to moderate impacts that occurred from ground disturbance during construction in 2018. In addition, no disturbance to vegetation from routine operation and maintenance of the buried pipeline, including vegetation maintenance, would be anticipated. With the implementation of weed management measures, normal operations would be expected to have short- or long-term, minor, localized impacts associated with the spread and establishment of noxious weeds that are not significant.

Should a crude oil release occur adjacent to or under Lake Oahe, impacts on vegetation would be short- to long-term and minor to moderate; however, with prompt implementation of required cleanup efforts, the impacts could be reduced to minor and potentially temporary impacts. Impacts on vegetation would occur on primarily shoreline vegetation from oil contamination and remediation activities (e.g., replacement and revegetation). However, as the potential for a WCD crude oil release is considered remote to very unlikely, the resulting risk of a release on vegetation would be negligible, and is not expected to have significant impacts. Vegetation and topsoil removal associated with cleanup and rehabilitation activities could result in the spread of noxious weeds; however, it is assumed that measures to minimize weed infestation would be implemented to result in impacts that would not be significant.

5.4.5. Wildlife and Aquatics

Alternatives 3 and 4 would not result in additional construction impacts on wildlife beyond the temporary to short-term, minor impacts from ground disturbance, noise, and lighting that occurred during the HDD of the pipe in 2018. In addition, no disturbance to wildlife or wildlife habitat from routine operation and maintenance of the buried pipeline, including vegetation maintenance, would be anticipated. Should a WCD crude oil release occur adjacent to or under Lake Oahe, short- to long-term, moderate to major impacts on wildlife could include mortality, reduced health, and dispersal of local wildlife species during the release and remediation. Long-term impacts could include chronic toxicity and reduced wildlife health due to exposure to crude oil constituents remaining in the soil and sediments following remediation. However, a WCD crude oil release is remote to very unlikely. As such, the moderate to major impacts described above combined with remote to very unlikely likelihood constitute a negligible to moderate risk that is not significant. Further, Alternative 4 includes an additional easement condition requiring Dakota Access to conform to the *National Bald Eagle Management Guidelines* (USFWS, 2007) and minimize off-road vehicle traffic in the event of any required remediation activities.

Alternatives 3 and 4 would not result in additional construction impacts on aquatic resources beyond the temporary, indirect, negligible impacts that may have occurred from stormwater runoff during the HDD of the pipe in 2018. In addition, no disturbance to aquatic resources from operation and maintenance of the buried pipeline, including vegetation maintenance, would be anticipated. Short- to long-term, moderate to major impacts could occur to aquatic resources due to habitat contamination and aquatic and semi-aquatic species injury and mortality should a WCD crude oil release occur adjacent to, or under Lake Oahe. As the potential for a WCD crude oil release is considered remote to very unlikely and the overall risk is negligible to moderate, these alternatives are not expected to have significant impacts.

To further reduce impacts on aquatic resources from a potential crude oil release, Alternative 4 includes additional easement conditions requiring Dakota Access to conduct biannual visual surveys, surface water sampling, and sediment and/or BMI sampling at the Lake Oahe crossing to monitor for the presence of petroleum-based hydrocarbons; and to conduct PAH fish tissue sampling should a crude oil release occur to support when PAH levels in fish return to pre-release conditions.

5.4.6. Land Use and Recreation

Alternatives 3 and 4 would result in no changes in land ownership beyond the 50 -foot -wide permanent easement required by the Applicant Proposed Action. In the event of a WCD crude oil release adjacent to or under Lake Oahe, impacts on land ownership would occur due to the need for temporary easements on which to conduct oil remediation activities. Impacts would be temporary and moderate based on restrictions in landowner activities. Additionally, the potential for a WCD crude oil release is considered remote to very unlikely; therefore, these alternatives are not expected to have significant impacts.

Alternatives 3 and 4 would result in no additional construction impacts on land use beyond the temporary to short--term, minor impact due to disruptions to grazing during construction in 2018. In addition, no disturbance to land use from routine operation and maintenance of the buried pipeline would be anticipated. In the event of a WCD crude oil release adjacent to or under Lake Oahe, short- to long-term and moderate to major impacts could occur on land use due to disruptions to grazing and irrigation during remediation. Because the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts on land use.

Alternatives 3 and 4 would result in no additional construction impacts on recreation and special interest areas beyond temporary minor impacts due to potential disruptions to recreation during construction in 2018. In addition, no disturbance to recreation from routine operation and maintenance of the buried pipeline, including vegetation maintenance, would be anticipated. In the event of a WCD crude oil release adjacent to or under Lake Oahe, short-term, moderate to major impacts on recreation and special interest areas would occur due to disruptions to recreational activities associated with Lake Oahe and its shoreline. As the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

5.4.7. Socioeconomics, Environmental Justice, and Health

Alternatives 3 and 4 would result in no additional construction socioeconomic impacts. Project operations would have a major beneficial economic impact from employment and tax revenues at the local or state level. In the event of a crude oil release adjacent to or under Lake Oahe, temporary, major adverse economic impacts would occur if agricultural water intakes become contaminated. Short-term, major economic impacts on the tourist economy associated with recreation would also occur. Because the potential for a crude oil release is considered remote to very unlikely, the socioeconomic risk is minor to moderate. The major, permanent socioeconomic benefits when considered against the minor to moderate risk of a WCD crude oil release continues to present an overall significant beneficial impact on socioeconomics.

The SRST and the CRST are environmental justice communities near the Lake Oahe crossing. Leading causes of death in tribal populations are reported to be heart disease, cancer, unintentional injuries, and diabetes. Other unique health issues including from exposure to hazardous pollutants have also been observed. These communities often bear disproportionate pollution and other health hazards. These communities may be reliant on subsistence use practices and treaty rights. The USDA depicts both the SRST and the CRST reservations as low-income census tracts in which a substantial number of individuals are more than 20 miles from the nearest grocery store (not including convenience stores).

Alternatives 3 and 4 would result in no additional construction impacts. In addition, no disturbance to wildlife or wildlife habitat from routine operation and maintenance of the buried pipeline, including vegetation maintenance, would be anticipated. Should a WCD crude oil release occur adjacent to or under Lake Oahe, short- to long-term, major impacts on the availability of subsistence resources (e.g., game species) could occur at the crossing location and downstream. This would subsequently result in a short- to long-term, moderate impact on subsistence and treaty rights, which include the right to practice subsistence harvesting. However, because the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts on environmental justice communities.

In the Remand Analysis, the USACE concluded that human health impacts would be possible if a crude oil release were to occur in or near Lake Oahe. Alternatives 3 and 4 would result in no additional construction impacts on human health, and no impacts from routine operation and maintenance of the buried pipeline would occur. Should a WCD crude oil release occur adjacent to or under Lake Oahe, short- to long-term, minor to major impacts on the health of community members could occur due to health effects from the ingestion of contaminated fish or water, accidents and injuries to first responders during remediation activities, and increased road traffic that could increase the risk of vehicular accidents. As the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

Operational impacts on environmental justice communities under Alternative 4 would be similar to Alternative 3. And for both Alternatives, Dakota Access's GRP and FRP, as well as robust detection system, automated valve shutoffs, and personnel to address any issues in real time, would help mitigate any release in the very unlikely case of an incident. In addition, Alternative 4 includes additional easement conditions to further avoid and minimize impacts on subsistence resources and health should a release occur, including:

- Improved leak detection systems as new technology becomes available;
- Developing a plan for food distribution to environmental justice communities that rely on traditional subsistence resources;
- Coordinating with the SRST and the CRST to undertake systematic subsistence studies; and
- Conducting biannual PAH fish tissue sampling in accordance with sampling protocols that the State of North Dakota utilizes for its monitoring program on the lake for methyl-mercury analysis to support when PAH levels in fish return to pre-release conditions following a crude oil release from DAPL, should one occur.

These additional measures would reduce the likelihood of a release and response time should a release occur and would minimize the impacts of any release. Therefore, impacts on subsistence and human health from operation of Alternative 4 are expected to be less than Alternative 3.

5.4.8. Transportation and Traffic

Alternatives 3 and 4 would result in no additional construction impacts on these transportation corridors. In addition, negligible intermittent adverse impacts on traffic from routine maintenance activities, which involve twice-monthly inspections, would be expected to occur. Operation of the pipeline would have a permanent moderate beneficial impact by eliminating the need for tanker trucks and trains to transport the crude oil through Morton County, avoiding the associated wear and tear and increased traffic on public roads and rail. In the event of a WCD crude oil release in or adjacent to Lake Oahe, local and regional vehicle and boating traffic could experience temporary to short-term, minor to major impacts due to increased traffic, traffic restrictions, and traffic closures to support remediation activities along the lake. As the potential for a WCD crude oil release is considered remote to very unlikely, these alternatives are not expected to have significant impacts.

5.4.9. Hazardous Waste

Alternatives 3 and 4 would result in no additional construction impacts. Hazardous materials generated or used during operation and maintenance would be managed and disposed of in accordance with applicable regulations. Impacts could occur should a WCD crude oil release occur adjacent to or under Lake Oahe, resulting in temporary to long-term, minor to major hazardous waste impacts due to the need for managing waste. As the potential for a WCD crude oil release is considered remote to very unlikely and the overall risk from hazardous waste would be minor to moderate, these alternatives are not expected to have significant hazardous waste impacts.

5.4.10. Cumulative Impacts

Alternatives 3 and 4 were determined to have significant cumulative impacts exclusively on socioeconomics and possibly environmental justice. These alternatives would not have any cumulative impacts on any of the other resources.

Future significant cumulative beneficial impacts on socioeconomics are anticipated as a result of employment and tax revenue to Applicant Proposed Action counties during continued operation of the Project. Therefore, cumulative impacts under Alternatives 3 and 4 combined with the actions above would be beneficial and significant.

Cumulative impacts related to environmental justice as a result of the Applicant Proposed Action combined with the actions described above are unknown as environmental justice reviews were not identified in the publicly available information associated with any of the above actions.

With regards to climate change, under each alternative the burning of fossil fuels would contribute to atmospheric GHG concentrations and an increased climate change potential to varying degrees. GHG emission impacts are additive as these gases accumulate in the atmosphere, and the atmospheric lifetimes of most GHGs are typically decades to centuries. Given that climate change itself is a significant environmental impact and that GHG emissions are additive, any impact at regional, national, and global levels resulting in GHG emissions would contribute incrementally to this issue.

5.5. Alternative 5 Impact Summary

Alternative 5 presents a reroute of the Applicant Proposed Action if an easement is not granted. The North Bismarck Reroute was initially evaluated in the 2016 EA, and therefore was selected for evaluation in this EIS as the most likely route that Dakota Access would consider. This alternative route would be 111 miles long, occurring approximately 50 miles north of the location, beginning in Mercer County where it would connect to customer receipt points. From that location, the reroute would extend southeast through Oliver, Morton, Burleigh, and Emmons counties, crossing the Missouri River approximately 8.5 miles east of the Yellowstone River and Missouri River confluence.

Based on the same start and end points, Alternative 5 is approximately 11 miles longer than the existing route. The North Bismarck Reroute would be co-located with other utilities for 3 percent of the route versus 41 percent for the constructed route. This alternative would result in increased greenfield area impacts.

Alternative 5 is estimated to result in approximately 1,200 acres of new temporary construction impacts and 700 acres of permanent greenfield right-of-way. This alternative would also require additional workspace and associated impacts necessary for the abandonment of approximately 100 miles of the existing DAPL Project pipeline, including the Lake Oahe crossing. Therefore, implementation of

Alternative 5 results in the abandonment of the Lake Oahe crossing under Alternative 1 or Alternative 2. Also, during the permitting and construction time period for the reroute, current DAPL Project shippers would likely seek to transport oil via trucking and/or rail. Therefore, Alternative 5 includes impacts associated with the additional abandonment and short-term oil transportation via truck and/or rail discussed below.

5.5.1. Reliability and Safety

Alternative 5 crosses the Missouri River north of Bismarck. This reroute would result in the construction of 111 miles of additional pipeline and cross an additional 1.6 miles more of PHMSA regulated HCAs than the existing route. From a safety perspective, construction activities can result in anything from no impacts to minor injuries to multiple fatalities, as heavy construction equipment and machinery are necessary.

Other operational impacts from the North Bismarck Reroute could occur as a result of an accidental release of crude oil. The overall impact area from a large release of crude would be similar to Alternatives 3 and 4. The North Bismarck Reroute crosses more waterways, grasslands, agricultural areas, and HCAs when compared to the current route; therefore, any pipeline oil release that occurs on land would likely be more severe under the North Bismarck Reroute than the current route, as the North Bismarck Reroute is closer to a larger amount of sensitive areas. Also, the North Bismarck Reroute crosses the Missouri River just 8.5 miles upstream of Bismarck and Mandan, meaning a release similar to the WCD scenarios modeled under Alternative 3—under specific conditions—would be able to reach these two urban areas, both of which would be classified as HCAs by PHMSA.

With respect to short-term impacts from transportation of oil by truck and/or rail, while pipelines release more crude by volume, rail and trucks are responsible for a greater number of releases than pipelines and result in more fatalities. As a result, rail and trucks, especially in the large numbers needed to replace the Project, present a great risk to the environment and significant risk on human lives.

Including the extensive construction impacts associated with Alternative 1 and the fatality impacts associated with trucking or rail under Alternative 5, the combined construction and operational impacts on reliability and safety for Alternatives 5 and 1 or Alternatives 5 and 2 would be significant.

5.5.2. Geology and Soils

The North Bismarck Reroute would cross similar geologic materials and formations as the 100-mile long existing route, but would result in about 111 miles of new short-term, minor geologic impacts. The effect on surface geology would be minor because impacts would be limited to construction activities and temporary disturbance of surficial geologic materials within the right-of-way. Dakota Access would likely implement the same or greater BMPs used during construction of the Applicant Proposed Action to minimize the impact on surficial geology and soils.

Should a crude oil release occur during construction or operation of the North Bismarck Reroute, impacts on geologic resources would depend on the extent and the remediation method. Impacts could range from temporary, minor impacts, to long-term, major impacts similar to Alternative 1.

Abandonment of about 100 miles of the DAPL Project would be similar to the effects on geology and soils described in Alternative 2. Further, DAPL Project shippers would likely utilize existing transportation infrastructure and would not build new roads or railways to transport oil via trucking and/or rail; therefore, indirect geologic or soil impacts from trucking or rail would be negligible under normal operating conditions. However, if a crude oil release occurs from trucking and/or rail, the excavation of contaminated materials would temporarily impact surficial geology in the area of the release; the magnitude of the impact would be dependent on the size of the release. Transportation of oil by truck or rail would likely result in more frequent, lower volume releases.

Due to the extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on geologic resources for Alternatives 5 and 1 would be significant. The combined construction and operation impacts on geologic resources for Alternatives 5 and 2 would not be significant. The combined construction and operation impacts on soils for Alternatives 5 and 1 or Alternatives 5 and 2 would not be significant.

5.5.3. Water Resources

Alternative 5 impacts from construction and operation of the North Bismarck Reroute and abandonment activities for the existing pipeline could cause temporary to long-term, minor to major impacts on two surface water source water protection areas and 149 mapped intermittent and perennial waterbodies. During the North Bismarck Alternative's construction, the shift of oil transport to rail and truck would pose a risk to adjacent waters because such means of transport have more frequent oil release incidents and are less regulated than pipelines in terms of their release recovery plans. With the implementation of water quality permitting requirements, impacts would not be significant.

The use of trucking and/or rail to transport oil during construction of the North Bismarck Reroute would have short-term, minor impacts on downstream water quality and surface water intakes in the event of a crude oil release. Operational impacts due to an inadvertent release of crude oil from the pipeline would likely be comparable to those described for Alternatives 3 and 4, with temporary to long-term, minor to moderate impacts. Overall, the combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on surface water would not be significant.

Alternative 5 impacts from construction and abandonment activities would be expected to have temporary to short-term, minor impacts on groundwater due to increased turbidity and lowered groundwater levels from dewatering. No groundwater source water protection areas, wellhead protection areas, or sole source aquifers would be affected. The combined impacts from Alternatives 1 and 5 and Alternatives 2 and 5 on groundwater would not be significant.

Alternative 5 impacts from construction and abandonment activities would be expected to have temporary to short-term impacts on up to 77 mapped NWI wetlands (totaling 21 acres) due to temporary trenching and filling during construction. With the implementation of wetland permit restoration and mitigation requirements, impacts would not be significant. The use of trucking and/or rail to transport oil during construction would have temporary to long-term, minor to moderate impacts on aquatic resources should a crude oil release occur. Impacts during operations due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4. Overall, the combined impacts on wetlands from Alternatives 1 and 5 or Alternatives 2 and 5 would not be significant.

Alternative 5 impacts from the North Bismarck Reroute would be expected to have temporary to short-term, negligible to minor impacts on floodplains from minor ground disturbance that be fully restored to allow flood retention. Overall, the combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on floodplains would not be significant.

5.5.4. Vegetation and Noxious Weeds

Compared to the existing route, construction of the North Bismarck Reroute would require 11 more miles of impact, in nearly identical land use types (primarily agriculture, and grass/pasture). One potential difference in vegetation types is that the North Bismarck Reroute crosses approximately 24 more miles of vegetation mapped by the NWI as wetland vegetation, compared to the existing route. All areas of ground disturbance would be revegetated with a native seed mix and monitored with the goal of revegetating the existing grassland/herbaceous vegetation to a minimum of 70 percent cover. This success criterion would likely be demonstrated in a minimum 2- to 3-year time period. Through the short-term construction duration, use of BMPs, and revegetation efforts, the impact of construction and operation of the North Bismarck Reroute would be short-term and moderate, but not result in a significant impact on vegetation. Operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4 with mitigated impacts on vegetation being negligible to moderate and temporary to long-term, resulting in an overall risk ranking of negligible to moderate.

Construction could cause the introduction or spread of new weed infestations along the length of the reroute during and after construction. In addition to the revegetation measures, Dakota Access would implement weed management measures proposed in the ECP (Appendix G of the 2016 EA). The resulting impacts associated with the spread and introduction of noxious weeds would be short-term and minor to moderate. During operations, the magnitude of impacts associated with noxious weeds would be expected to be the same as described above for Alternatives 3 and 4 (short- or long-term but localized, resulting in a moderate but not significant impact on the spread of noxious weeds during operations). Overall given the revegetation and weed management measures that would be implemented, the impact of construction and operation of the North Bismarck Reroute would not likely result in a significant impact on the spread of noxious weeds.

Impacts associated with Alternative 5 also include the abandonment of the about 100 miles of pipeline as discussed under Alternative 1 or Alternative 2 above. Abandonment is expected to cause short-term, limited ground disturbance for capping any line segments, as needed, and therefore would have minor intensity impacts on vegetation. The use of trucking and/or rail to transport oil during construction would have short- to long-term, minor to moderate impacts on vegetation should a crude oil release occur. Noxious weed spread and establishment impacts associated with abandonment would be short- or long-term, highly localized, and minor to moderate. Although there would be extensive construction impacts associated with Alternative 1, the combined construction and operation impacts on noxious weeds for Alternatives 5 and 1 would still be considered moderate and not significant. Given fewer construction impacts, the combined construction and operation impacts on noxious weeds for Alternatives 5 and 2 would also not be significant.

5.5.5. Wildlife and Aquatic Resources

The North Bismarck Reroute would pass mostly through agriculture fields and areas that are previously undisturbed by pipelines. This route also passes within 6 miles of the Long Lake National Wildlife Refuge and within 2.1 miles of the Appert Lake National Wildlife Refuge. Impacts from construction of this pipeline would include lighting, noise, habitat disturbance, and potential small inadvertent releases of hazardous materials. Impacts from the construction of the North Bismarck Reroute would be generally indirect, temporary to long-term, and negligible to moderate. Operational impacts from the North Bismarck Reroute due to an inadvertent release of crude oil would be comparable to those described for Alternatives 3 and 4, with short- to long-term, major impacts but a remote to very unlikely potential of occurrence. With the implementation of permitting mitigation requirements, impacts would not be significant.

Trucking and railway transport of the oil during construction of the reroute would have short- to long-term, minor to moderate impacts due to wildlife collisions, lighting, noise, and inadvertent crude oil releases. Impacts of a crude oil release from a truck or railcar would be similar to what is described in Alternatives 3 and 4, although with less severe impacts as trucks and railcars would be transporting less volume, resulting in easier cleanup and remediation. Lighting and noise impacts from trucks or railcars would likely be minor as existing highways and railroads would be used where wildlife species are likely already acclimated to the occasional increases in lighting and noise caused by the transportation routes. Overall, the combined impacts on wildlife from Alternatives 1 and 5 or Alternatives 2 and 5 would not be significant since in all cases, wildlife populations and habitat would be expected to recover.

The construction and operation of the North Bismarck Reroute would also result in impacts on aquatic resources. The North Bismarck Reroute would pass through 141 intermittent waterbodies, 8 perennial waterbodies, and 77 wetlands (e.g., palustrine emergent, palustrine forested, and freshwater ponds) that provide habitat to a variety of aquatic species. Impacts from construction and abandonment activities on aquatic resources would be expected to involve temporary to short-term, minor to moderate impacts due to habitat disturbance and a temporary increase in stress and mortality of aquatic organisms during pipeline installation through waterbodies and wetlands. With the implementation of permitting mitigation requirements, impacts would not be significant.

The use of trucking and/or rail to transport oil during construction would have short- to long-term, minor to moderate impacts on aquatic resources should a crude oil release occur. Operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4 (short- to long-term, moderate to major impacts). Overall, the combined impacts from Alternatives 1 and 5 on aquatic resources would be significant given the intensity and duration of impacts from Alternative 1, while the combined impacts from Alternatives 2 and 5 would not be significant with mitigation.

5.5.6. Land Use and Recreation

Alternative 5 impacts from construction of the North Bismarck Reroute and abandonment activities would have permanent and moderate impacts on land ownership due to the need for new pipeline easements across state and private property for the reroute. It is unknown whether landowners along the North Bismarck Reroute would be willing to negotiate an easement. In addition, the State of North

Dakota previously evaluated the DAPL Project's siting in North Dakota, issued the required permissions for the Lake Oahe route, and has provided input that it is opposed to Alternative 5 based upon this previous consideration. Therefore, the North Bismarck Reroute presents a conflict with the state's past analysis. The use of trucking and/or rail to transport oil during construction could require temporary to short-term impacts on land ownership during cleanup and remediation activities should a crude oil release occur. The combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on land ownership would not be significant.

Alternative 5 impacts from reroute construction and abandonment activities would have temporary to short-term, minor impacts on land use due to disruptions to grazing. Operation of the pipeline would not disturb the land, limit agriculture or ranching, or change the existing land use classifications. However, operational impacts due to an inadvertent release of crude oil from the pipeline would be comparable to those described for Alternatives 3 and 4, with short- to long-term, major impacts but a very unlikely potential of occurrence. Because of the extensive construction impacts associated with Alternative 1, the combined construction and operational impacts on land use for Alternatives 5 and 1 would be significant. The combined construction and operational impacts on land use for Alternatives 5 and 2 would not be significant.

Regarding recreation, the North Bismarck Reroute is close to and/or crosses multiple conservation easements, habitat management areas, National Wildlife Refuges, state trust lands, waterfowl production areas, and private tribal lands. Because there are fewer recreational resources along the existing route, construction of Alternative 5 could impede wildlife viewing, hiking, and other recreational activities. Alternative 5 would result in temporary and moderate impacts on recreational activities. Alternative 5 could also result in operational impacts on adjacent recreational areas in the event of an inadvertent crude oil release. The combined construction and operational impacts on recreation for Alternatives 5 and 1 or Alternatives 5 and 2 would not be significant.

5.5.7. Cultural Resources

Alternative 5 would require ground disturbance along the reroute; therefore, a cultural resource investigation of the USACE-defined APE may be needed near the USACE-permitted areas. Any adverse effects on historic properties identified during new cultural resource investigations along the North Bismarck Reroute would need to be avoided, minimized, or mitigated. Also, Dakota Access' UDP would be used in the event that an undocumented cultural resource was discovered during construction activities.

All construction workspace associated with abandonment of about 100 miles of the existing DAPL Project would be within previously surveyed locations where no historic properties were identified; therefore, impacts on historic properties would not be anticipated. However, if any new construction workspace would be needed outside of the previously surveyed area, cultural and historic resources could be impacted and additional survey would be required.

In conclusion, construction and operation impacts on cultural resources associated with Alternative 5 are not expected to be significant. The combined construction and operation impacts on cultural resources for Alternatives 5 and 1 or 2 would not be significant.

5.5.8. Socioeconomics, Environmental Justice, and Health

Construction of the North Bismarck Reroute and abandonment of about 100 miles of the existing pipeline would result in short-term, beneficial impacts on the economy due to the employment of a temporary workforce consisting of about 1,050 temporary jobs and 4,200 temporary indirect jobs. Operation would have a permanent beneficial economic impact through net gain in ad valorem taxes for more counties, including Emmons, Oliver, Burleigh, Mercer, and Morton counties, although Mercer and Morton counties would experience a tax decrease. These generally beneficial effects would be countered by short-term, minor to moderate, adverse impacts caused respectively by increased demands on medical and emergency services, increased costs to farmers associated with shipping agricultural products due to an increase in shipping for oil during construction. The State of North Dakota also expects that trucking and rail would be unable to accommodate the entire capacity of the DAPL Project, leading to oil rig closures, which would be a moderate and short-term, adverse impact on local and state economies. The overall combined impacts on socioeconomics from Alternatives 1 and 5 or Alternatives 2 and 5 would be significant and adverse due to the major and long-term to permanent adverse impacts on local and state economies from Alternatives 1 or 2.

Alternative 5 would result in temporary to long-term negligible to moderate impacts on subsistence resources and treaty rights. Because most of the reroute would be on private land where access to private lands is limited, impacts would not be significant. The use of truck and/or rail to transport the crude oil during construction of the North Bismarck Reroute could result in several negative effects on subsistence. An increase in the number of trucks and trains carrying crude oil would affect animals' nutritional health and increase the potential for vehicle collisions with wildlife as well as the inadvertent release of crude oil into terrestrial habitat or aquatic habitat. Transportation of oil by truck or rail would likely result in more frequent, lower volume releases. These releases could have adverse effects on terrestrial and aquatic resources; therefore, impacts on subsistence could translate into human health impacts if alternative comparable food options were not available. Increased rail and truck traffic could also lead to an increased number of traffic fatalities.

Alternative 5 could result in temporary to long-term, minor to moderate impacts on health due to pollutant emissions affecting air quality, the increased risk of vehicular accidents due to construction traffic, potential injury and fatality of workers, and the potential of a crude oil release either during truck and rail transport or pipeline operation. Based on risk levels and/or impact intensity, the construction and operation of the North Bismarck Reroute would not have significant impacts on health. Overall, the combined impacts from Alternatives 1 and 5 on health would be significant given the intensity and duration of impacts from Alternative 1, while the combined impacts from Alternatives 2 and 5 would not be significant given the impacts from Alternative 2.

The transition to truck and/or rail to transport the crude oil extracted from MHA Nation wells is anticipated to occur gradually (months to a year), with a need to restart loading/offloading terminals and hire more workers. During the transition to truck and/or rail transport, the economic impact on MHA Nation programs related to health would be temporary.

Overall, the combined impacts from Alternatives 1 and 5 on environmental justice, treaty rights, subsistence, and health would be significant given the intensity and duration of impacts from Alternative

1, while the combined impacts from Alternatives 2 and 5 would not be significant given the impacts from Alternative 2.

5.5.9. Transportation and Traffic

The North Bismarck Reroute would cross various roads along the 111-mile route and would link work areas to major highways during construction. The road corridors used during construction would have various traffic volumes and size and weight restrictions. It is assumed that construction-related traffic volumes would increase, lane or road closures would occur, and road improvements would occur. The reroute would have short-term, minor, localized impacts on local traffic due to lane and road closures for road improvements and construction traffic. Overall, the combined impacts from Alternatives 1 and 5 or Alternatives 2 and 5 on transportation and traffic would not be significant.

While the reroute is in the permitting process and under construction, the crude oil could instead be transported by rail or truck. If transported by rail, approximately four loaded crude oil trains (100 cars each) would pass through Morton County each day on the way to and from the two nearby terminals: 1) Bakken Oil Express in Dickinson, North Dakota, and 2) Great Northern Midstream in Fryburg, North Dakota. A transportation bottleneck is related to limited terminal capacity rather than rail capacity.

For transportation via truck, a fleet of over 15,000 tanker trucks driving around the clock would be required to transport the volume of crude oil from the Project including the Optimization Project. The increase in road traffic from the additional tanker trucks could potentially have a noticeable long-term impact on local traffic patterns near the filling locations, which are not near the Applicant Proposed Action. This increase in traffic could also result in an overall decrease in safety, potentially leading to additional traffic-related fatalities every year.

The number of trains and trucks that would be used as a substitute for the pipeline would be affected by the availability of those modes of transportation and the cost of those modes of transportation as compared to the pipeline, which would affect the amount of oil transported.

The use of trucks and trains during construction would have a short-term, minor to moderate impact on rail transportation corridors and a short-term, moderate impact on road transportation in North Dakota due to increased traffic.

The combined construction and operation impacts on transportation and traffic for Alternatives 5 and 1 and Alternatives 5 and 2 would not be significant.

5.5.10. Hazardous Waste

Alternative 5 would result in a moderate amount of solid waste being generated during construction of the North Bismarck Reroute including hazardous wastes, non-hazardous wastes, special wastes, and universal wastes from construction and surface disturbance activities. These activities would have temporary to short-term impacts dependent on volume of waste generated and how quickly the waste is characterized, profiled, and transported to the disposal facility. This alternative would have a minor impact due to the less complex nature of managing moderate volumes of wastes, the number of waste streams, and the risk of violating regulatory requirements that govern the management of waste.

The USACE assumes that the pipeline would be abandoned in place, resulting in a moderate amount of solid waste that would be generated from minor earth disturbances for cutting and capping the line in segments as needed. Crude oil releases from truck and/or rail transportation would require remediation of petroleum contaminated soils or water, which would occur over months to years depending on the size of a release. A crude oil release is more likely to occur during truck and/or rail transportation than during transportation via pipeline, although it is expected to result in less volume released and would result in minor to major impacts from hazardous waste due to the need for managing waste within remediation activity regulatory requirements.

Construction and operational impacts from hazardous waste for Alternative 5 would not be significant. Further, the combined construction and operation impacts from hazardous waste for Alternatives 5 and 1 or Alternatives 5 and 2 are not expected to be significant.

5.5.11. Air Quality and Noise

Similar to the existing about 100-mile-long route, the North Bismarck Reroute would be located in an area that is in attainment or unclassified with respect to the NAAQS in 2016. Emissions would be generated during construction of the 111-mile pipeline reroute, including non-road and on-road gasoline and diesel emissions and fugitive dust from earth-disturbing activities. This temporary increase in criteria pollutant emissions and HAPs would result in a short-term, minor impact on air quality in the vicinity and would not impact air quality or visibility in the region.

Abandonment of the existing about 100 miles of pipeline would generate additional construction emissions, including non-road and on-road gasoline and diesel emissions and fugitive dust from earth-disturbing activities. Because abandonment would involve very little ground disturbance and minimal construction activities, the amount of construction emissions associated with pipeline abandonment would be smaller than the emissions associated with the original pipeline construction, resulting in temporary, minor impacts on air quality.

The truck and rail transport required during construction of the reroute would be conducted to and from the Bakken Oil Express Terminal in Dickinson, North Dakota, and the Great Northern Midstream Terminal in Fryburg, North Dakota. Truck and rail transport would result in no new construction emissions. Rail transport of crude oil would generate air emissions, including GHGs, associated with the operation of the crude oil trains and tanker trucks, which are typically diesel-fired engines, with the amount of GHG emissions generated depending on the amount of oil transported by rail and/or truck, factoring in the availability and cost of this mode of transport.

Construction and operation impacts on air quality for Alternative 5 would result in temporary and short-term, minor impacts and would not be significant. Based on the preceding assessments, the combined construction and operation impacts on air quality for Alternatives 5 and 1 or Alternatives 5 and 2 would not be significant.

The North Bismarck Reroute sound levels would be transient and not concentrated in one area for a long period of time. Therefore, impacts on any NSAs in proximity to the new pipeline route would be shorter in duration than the original pipeline HDD installation. This temporary increase in ambient noise would result in a minor, temporary impact on sound levels in the vicinity. Construction and operation noise impacts for Alternative 5 would not be significant. Based on the preceding assessments, the combined construction and operation noise impacts for Alternatives 5 and 1 or Alternatives 5 and 2 would not be significant.

5.5.12. Climate Change

Under Alternative 5, construction and abandonment activities would result in the short-term generation of GHG emissions from construction vehicles and equipment and trucks and trains used for oil transport during permitting and construction of the North Bismarck Reroute, with the amount of GHG emissions generated depending on the amount of oil transported. Transportation by truck would result in the release of more GHG than transport by pipeline. In contrast, transport by rail would result in the release of less GHG emissions than transport by pipeline; however, this conclusion could change (and may have already changed) based on lower GHG emissions associated with pipeline operation as power plants that provide power to pumping stations and support pipeline operations reduce their GHG emissions. GHG emissions associated with Alternative 5 would be in addition to the GHG emissions from the abandonment activities discussed under Alternative 1 or Alternative 2 above.

5.5.13. Cumulative Impacts

Cumulative impacts associated with Alternative 5 that were determined to be moderate or major were identified exclusively for noxious weeds and socioeconomics. For all other resources, Alternative 5 was determined to either 1) not have any cumulative impacts, or to have negligible to minor cumulative impacts, or 2) the resource was outside the geographic and/or temporal scope of the cumulative effects analysis—based on the geographic and temporal scopes presented for each resource in Section 4.1.2, [Cumulative Impacts] Step 2: Establish Boundaries (Geographic and Temporal).

Ground disturbance associated with the North Bismarck Reroute combined with the Applicant Proposed Action and livestock grazing could contribute to a cumulative increase in noxious weed distribution. Revegetation and weed control measures would make these impacts short- to long-term, moderate, and not significant.

Construction and operation of the North Bismarck Reroute under Alternative 5 would contribute to significant cumulative beneficial impacts socioeconomics and the economy due to tax revenue and employment along with the operation of the actions listed above. The combined cumulative impacts for Alternatives 1 and 5 and Alternatives 2 and 5 would be beneficial and significant.

Under each alternative, the burning of fossil fuels would contribute to atmospheric GHG concentrations and an increased climate change potential to varying degrees. GHG emission impacts are additive as these gases accumulate in the atmosphere, and the atmospheric lifetimes of most GHGs are typically decades to centuries. Given that climate change itself is a significant environmental impact and that GHG emissions are additive, any impact at regional, national, and global levels resulting in GHG emissions would contribute incrementally to this issue.

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