A: Biological Resources: ESA Section 7 Biological Assessments and Biological Opinions



United States Department of the Interior

FISH AND WILDLIFE SERVICE 134 Union Blvd Lakewood, Colorado 80228



In Reply Refer to: FWS/R6

DEC 23 2019

Ms. Kim Prill Bureau of Land Management Montana Dakotas State Office 5001 Southgate Drive Billings, Montana 59101

Dear Ms. Prill:

On September 30, 2019, the Bureau of Land Management (BLM), in coordination with the Western Area Power Administration (WAPA), the Rural Utilities Service (RUS), and the U.S. Army Corps of Engineers (USACE) (Federal agencies), requested initiation of formal consultation for the effects of the proposed Keystone XL pipeline Project (Project), proposed by TC Energy (formerly known as TransCanada) Keystone Pipeline, LP (Keystone), under section 7 of the Endangered Species Act (ESA) of 1973 (87 Stat.884, as amended; 16 U.S.C. 1531 et seq.) for the federally listed endangered American burying beetle (ABB) (Nicrophorus americanus). The Project involves the proposed construction and operation of an 882-mile-long pipeline, including ancillary facilities, temporary workspaces, construction camps, access roads, and other aboveground facilities, including powers stations and power lines. Accordingly, this memo transmits the final Biological Opinion (BO) on the effects of the Federal agencies' actions as described in the November 26, 2019 amended Biological Assessment (BA) (BLM 2019, entire). The Federal agencies intend to rely on this document to fulfill their obligations under section 7 of the ESA.

In its BA, the Federal agencies have considered the effects of the Project on 10 federally listed species and designated critical habitat and has made several preliminary determinations of effect based on: (1) correspondence with the U.S. Fish and Wildlife Service (Service), participating Federal agencies, and state wildlife agencies; (2) habitat requirements and the known distribution of these species within the Project area; (3) habitat analyses and field surveys that were conducted for these species from 2008 through 2019; (4) conservation measures committed to in the BA and BO, and (5) the Service whooping crane (Grus americana) public sightings database (Service 2019), and telemetry data collected by the U.S. Geological Survey and provided by the Nebraska Ecological Services Office in December of 2018 (Service 2017). Potential effects associated with electrical infrastructure for the proposed pipeline have also been assessed within the BA, based on the best available data.

INTERIOR REGION 5 MISSOURI BASIN KANSAS, MONTANA*, NEBRASKA, NORTH DAKOTA, SOUTH DAKOTA "PAR IJAL INTERIOR REGION 7 UPPER COLORADO RIVER BASIN

COLORADO, NEW MEXICO, UTAH, WYOMING

Areas along proposed power line routes have not yet been field surveyed for the presence of protected species or their habitats; therefore, the potential for each species to occur along power line routes was evaluated based on a review of aerial imagery and on reviews of species occurrence records in state databases (NNHP 2019, entire; SDNHP 2019, entire). In addition to areas having documented occurrences, an area was determined to have potential for presence of a listed species where it contains one or more land cover type(s) serving as potentially suitable habitat for the species (forest, sandbar, etc., depending on species) and is within the known current range of that species. A summary of the species included in the analysis and an effects determination is provided below (Table 1).

The Service concurs with the determinations (see p. 9, Table 1.4-1 of the BA) made by the Federal agencies that the Project may affect but is not likely to adversely affect the endangered black-footed ferret (Mustela nigripes), interior least tern (Sterna antillarum), whooping crane, pallid sturgeon (Scaphirhynchus albus), and topeka shiner (Notropis topeka); and the threatened piping plover (Charadrius melodus), rufa red knot (Calidris canutus rufa), and western prairie fringed orchid (Platanthera praeclara). A detailed discussion of factors contributing to our concurrence with the above not likely to adversely affect (NLAA) and may affect determinations is included within the BA and are also summarized in the table below (Table 1). A summary of species habitat surveys conducted for the Project is included page 10-11 in Table 1.4-2 of the BA (BLM 2019).

Additionally, the Federal agencies determined that the proposed project may affect the threatened Northern long-eared bat (Myotis septentrionalis), but rely on the Service's January 5, 2016, Programmatic Biological Opinion on Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions to fulfill its section 7(a)(2) consultation obligation. Additional information for this species and consultation is described in Introduction section of the BO.

Keystone XL

Table 1. ESA Section 7 Determinations and Service Concurrence.

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
Interior least tern	Not Likely to Adversely Affect	Yes	This determination is based on Keystone's plan to use horizontal directional drill (HDD) when crossing the Missouri, Platte, Elkhorn, Niobrara, Cheyenne, and Yellowstone rivers and Keystone's and electric power providers' commitment to follow conservation measures identified by the Service. Specifically, pre-construction surveys to identify nesting least terns within 0.25 miles of the proposed river crossings and the commitment to halt construction should nesting individuals be identified, would avoid effects on nesting interior least terns. While migrating least terns may encounter construction activities during spring and fall migration, effects on potentially suitable habitat are not expected due to the use of HDD. Although new electric power lines would increase the collision and predation potential for interior least terns, none of the proposed power lines would overlap suitable nesting or foraging habitat, and only a small portion of one power line, co-located on existing structures, would approach within 1 mile of potentially suitable habitat. Installation of bird flight diverters (BFDs) may incidentally	•	Keystone will complete crossings of major rivers and riverine habitat using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur. Frac-out is the unintentional return of drilling fluids to the surface during HDD. Where practicable, Keystone will maintain vegetative screening at HDD sites to prevent disturbance of interior least terns. Should HDD activities occur at night, Keystone will down-shield lights when the site is within 0.25 mile of potentially suitable habitat and vegetative screening is lacking. Keystone will conduct pre-construction presence/probable absence surveys of pipeline crossings within 0.25 mile of potentially suitable breeding habitat at the Platte, Elkhorn, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone River in Montana during the interior least tern nesting season (April 15 to September 1) to ensure that there are no nesting pairs within 0.25 mile of the construction area. If interior least tern nests are found at the crossings, Keystone will: (1) adhere to a 0.25-mile buffer of no pipeline construction activity and (2) continue to monitor nests if any are within 0.25 mile of the construction footprint until young have fledged.

¹ Conservation Measures will be implemented by Keystone and/or the electric power providers, as specified, as part of its Project

Keystone XL

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
Species	Determination	Concurs	reduce the risk of other bird species, including interior least terms.	•	Keystone will conduct daily surveys for nesting terns during the nesting season when construction activities occur within 0.25 mile of potential nesting habitat. If nesting terns are present, Keystone will make minor adjustments to the pipeline corridor, if practicable, to avoid nesting interior least terns, in coordination with the Service. This may involve shifting the pipeline corridor away from nests to avoid disturbances to interior least tern nests or other modifications depending on the circumstances. To the extent practicable, Keystone will conduct construction activities mostly during daytime hours and will comply with any local noise regulations. Keystone will properly equip construction equipment with mufflers to lessen noise impacts. Keystone will implement a project-specific Spill Prevention, Control, and Countermeasure (SPCC) Plan (Appendix D of the BA). Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge, which is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment; a
				•	Keystone will conduct refueling and lubrication of construction equipment in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.

4

.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 Keystone will perform all equipment maintenance and repairs in upland locations at least 100 feet from waterbodies and wetlands. Keystone will park all equipment at least 100 feet from a watercourse or wetland overnight, if possible. Keystone will not wash equipment in streams or wetlands. Keystone will conduct construction and restoration activities to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Keystone will ensure each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials. Keystone will ensure water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow. Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30-day period except where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source. During Keystone's aerial surveillance, aircraft will maintain at least 1,000 feet of elevation. If construction of power lines occurs during the interior least tern nesting season, Keystone will conduct surveys of potentially suitable riverine and/or sand pit nesting habitat within 0.25 mile of new power lines within 2 weeks of construction to determine presence of nesting pairs. If nesting interior least terns are present, Keystone will cease construction until chicks fledge from the site.

Keystone XL

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
				•	Electric power providers will install anti-perching measures on all structures within 0.1 mile of either side of the proposed crossings of the Platte, Elkhorn, Niobrara, Cheyenne, Yellowstone, Milk and Missouri rivers.
Piping plover	Not Likely to Adversely Affect	Yes	This determination is based on Keystone's plan to use HDD when crossing the Missouri, Platte, Elkhorn, Niobrara, Cheyenne, and Yellowstone rivers and Keystone's and electric power providers' commitment to follow conservation measures identified by the Service. Specifically, pre-construction surveys to identify nesting piping plovers within 0.25 miles of the proposed river crossings and the commitment to halt construction should nesting individuals be identified, would avoid effects on nesting piping plovers. While migrating piping plovers may encounter construction activities during spring and fall migration, effects on potentially suitable habitat are not expected due to the use of HDD. Although new electric power lines would increase the collision and predation potential for piping plovers, none of the proposed power lines would overlap suitable nesting or foraging habitat, and only a small portion of one power line, co-located on existing structures, would approach within 1 mile of potentially suitable habitat. Installation of BFDs may incidentally	•	Keystone will complete crossings of major rivers and riverine habitat using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur. Where practicable, Keystone will maintain vegetative screening at HDD sites to prevent disturbance of piping plovers. Should HDD activities occur at night, Keystone will down-shield lights when the site is within 0.25 miles of potentially suitable habitat and vegetative screening is lacking. Keystone will conduct pre-construction presence/probable absence surveys of pipeline crossings within 0.25 mile of potentially suitable breeding habitat at the Platte, Elkhorn, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone River in Montana during the piping plover nesting season (April 15 to September 1) to ensure that there are no nesting pairs within 0.25 mile of the construction area. If piping plover nests are found at the crossings, Keystone will: (1) adhere to a 0.25-mile buffer of no pipeline construction activity and (2) continue to monitor nests if any are within 0.25 mile of the construction footprint until young have fledged.

Keystone XL

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
			reduce the risk of other bird species, including piping plovers.	•	Keystone will conduct daily surveys for nesting piping plovers during the nesting season when construction activities occur within 0.25 mile of potential nesting habitat.
				•	If nesting piping plovers are present, Keystone will make minor adjustments to the pipeline corridor, if practicable, to avoid nesting plovers, in coordination with the Service. This may involve shifting the pipeline corridor away from nests to avoid disturbances to piping plover nests or other modifications depending on the circumstances.
				•	To the extent practicable, Keystone's construction within 0.25 mile of a piping plover nest will occur mostly during daytime hours and will comply with any local noise regulations.
				•	Keystone's construction equipment will be properly equipped with mufflers to lessen noise impacts.
				•	Keystone will implement a project-specific SPCC Plan. Keystone will mark and maintain a 100-foot buffer from
				•	river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite. Keystone will conduct refueling and lubrication of construction equipment in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
		÷		 Keystone will perform all equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands. Keystone will park all equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible. Keystone will ensure equipment will not be washed in streams or wetlands.
		×		 Keystone's Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Keystone will ensure that each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials. Keystone will ensure that water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow. Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for
				 withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30-day period except where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source. During aerial surveillance, Keystone's aircraft will maintain at least 1,000 feet of elevation. If construction of power lines occurs during the piping plover nesting season, Keystone or the electric power providers will conduct surveys of potentially suitable riverine and/or sand pit plover nesting habitat within 0.25 mile of new power lines within 2 weeks of construction to

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 determine presence of nesting pairs. If nesting plovers are present, construction will cease until all chicks fledge from the site. Electric power providers will install anti-perching measures on all structures within 0.1 mile of either side of the proposed crossings of the Platte, Elkhorn, Niobrara, Cheyenne, Yellowstone, Milk and Missouri rivers. Should potentially suitable breeding or foraging habitat for piping plover be identified near the proposed Project at a later time, power lines near breeding habitat (and within 0.25 mile of each side) and lines that will be built between rivers and sand and gravel mining areas, electric power providers will mark power lines with BFDs to reduce potential injury or mortality to piping plovers. Electric power providers will route power lines to avoid construction within 0.50 mile of potentially suitable piping plover nesting habitat in alkali wetlands in Montana. NorVal Electric Cooperative will install BFDs in all locations where the power line to PS-10 comes within 0.25 mile of either side of the Milk River. Additionally, BFDs will be installed for 0.25 mile on either side of two unnamed reservoirs crossed by the proposed power line to PS-10.
Rufa red knot	Not Likely to Adversely Affect	Yes	Adverse effects on rufa red knot are unlikely based on (1) the proposed pipeline would not affect stopover habitat; (2) there is very little potentially suitable stopover habitat proximal to the proposed power lines; (3) rufa red knot are extremely uncommon in the Central Flyway; and (4) the increase in power lines	 Keystone will complete crossings of major rivers and riverine habitat using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
			associated with pump stations is 0.1 percent of existing large power lines. Therefore, no measurable effects are anticipated for the rufa red knot as a result of the Project.	 Keystone will implement a project-specific SPCC Plan. To the extent practicable, Keystone's construction will occur mostly during daytime hours and will comply with any local noise regulations. Keystone's construction equipment will be properly equipped with mufflers to lessen noise impacts. Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite. Keystone will refuel or lubricate construction equipment in uplands and greater than100feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities. Keystone will perform all equipment maintenance and repairs in upland locations at least 100 feet from a watercourse or wetland overnight, if possible. Keystone will not wash equipment in streams or wetlands. Keystone will ensure each construction crew and cleanup of spills of fuel and other hazardous materials. Keystone will and other hazardous materials.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 recovery of spilled materials. Keystone will ensure water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow. Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in their permits. Water will be returned to its source within a 30-day period except where hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.
Whooping crane	Not Likely to Adversely Affect	Yes	No documented whooping crane historical or telemetry observations have been identified within 1.5 miles of the action area and only one record is within 3.5 miles. Given (1) the limited number of individuals, (2) the lack of historical or recent telemetry records in the action area despite the long-term nature of the historical data and the fact that the telemetry data are not dependent on human observation, (3) the low probability of a collision during migration, and (4) the proposed conservation measures developed in conjunction with the Service, adverse effects are unlikely. BLM used the Service's "A Review and Critique of Risk Assessments Considered by the U.S. Fish and Wildlife Service Regarding the Collision Risk for Whooping Cranes with NPPD's R-Project"	 Keystone will complete crossings of major rivers and riverine habitat using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur. Should HDD activities occur at night, Keystone will down-shield lights during the spring and fall whooping crane migration seasons in areas that provide potentially suitable habitat. Where practicable, Keystone will maintain vegetative screening at HDD sites to prevent disturbance of whooping cranes. During spring (March–May) and fall (October–November) whooping crane migration periods, Keystone's environmental monitors will complete a daily brief survey of any wetland or riverine habitat areas potentially used by whooping cranes in the morning and afternoon before starting equipment and following the Whooping Crane Survey Protocol previously developed

NUVSIONU AL	Key	/stone	XL
-------------	-----	--------	----

		U		
Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
			(https://www.fws.gov/mountain- prairie/es/nebraska/library/USFWS- Whooping-Crane-Whitepaper-final-w- Attachments.pdf), dated January 30, 2019 to develop a collision risk assessment and determined risks to whooping cranes would be very low.	 by the Service and Nebraska Game and Parks Commission [NGPC] (NGPC and Service 2017). If whooping cranes are sighted, the environmental monitor will immediately contact the Service and respective state agency in Nebraska, South Dakota, and/or Montana for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area. The compliance manager will record the sighting, bird departure time, and work start time on the survey form. The Service will notify the compliance manager of whooping crane migration locations during the spring and fall migrations through information gathered from the whooping crane tracking program. Keystone will re-vegetate disturbed areas (particularly within riparian zones and in wetland habitats) in accordance with the Construction, Mitigation, and Reclamation Plan (CMRP) and U.S. Army Corps of Engineers (USACE) permit requirements. Keystone's use of helicopters within 0.5 mile of any whooping crane(s) will be prohibited. Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
Species	Determination	Concurs		 Keystone will refuel and lubricate construction equipment in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities. Keystone will perform all equipment maintenance and repairs in upland locations at least 100 feet from waterbodies and wetlands. Keystone will park all equipment at least 100 feet from a watercourse or wetland overnight, if possible. Keystone's equipment will not be washed in streams or wetlands. Keystone's construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Keystone will ensure each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials. Keystone will ensure water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow. Keystone will minimize temporary water reductions by
				withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30 day period except
				where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.

• During aerial surveillance, Keystone's aircraft will maintain at least 1,000 feet of elevation.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 Should power lines be adjusted, the electric power provider will site them greater than 5 miles from Designated Critical Habitat and/or documented high-use areas. Electric Power providers will mark new lines with BFDs within 1 mile of potentially suitable habitat within the 95-percent migration corridor. Electric Power providers will mark new lines with BFDs near potentially suitable habitat outside the 95-percent migration corridor at the discretion of the local Service Ecological Services Field Office, based on the biological needs of the whooping crane. Thus far, this will include the following: The power line to PS-09 will be marked with BFDs within 0.25 mile of crossings of the Milk River. The power line to PS-10 will be marked with BFDs within 0.25 mile of crossings of the Milk River and within 0.25 mile of two unnamed reservoirs crossed by the line. The power line to PS-12 will be marked with BFDs within 0.25 mile of crossings of the Redwater River and Buffalo Springs Creek. The power line to PS-14 will be marked with BFDs within 0.25 mile of crossings of Pennel Creek and an unnamed pond in the northwest corner of section 35, township 9 north, range 58 east, in Fallon County, Montana. Keystone will develop a compliance monitoring plan that requires written confirmation that the power lines have been marked with BFDs and that the markers are maintained in working condition. Electric power providers will complete daily presence/probable absence surveys in potentially suitable habitat according to the Project's protocol described

Keystone	XL
Reystone	AL

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
Species Northern long-eared bat	ESA Section 7 Determination May Affect, Likely to Adversely Affect, relying on Service's 2016 Programmatic Biological Opinion on the Final 4(d) Rule for the NLEB and Activities Excepted from Take Prohibitions to fulfill its section 7(a)(2) consultation obligation	See Introduction Section of BO for more information	RationaleOnly known presence of northern long- eared bat (NLEB) in the action area was from four NLEBs fitted with transmitters within 1 mile of Fort Peck spillway. However, these were not maternity roosts. There are no known occupied maternity roost trees, or known occupied hibernacula occur within 1 mile of the action area. The proposed Project "may affect" the northern long-eared bat due to the alteration of approximately 81 acres of potentially suitable habitat. However, the proposed Project relies on the Service's January 5, 2016, Programmatic Biological Opinion on the Final 4(d) Rule for the NLEB and Activities Excepted from Take Prohibitions to fulfill its section 7(a)(2) consultation obligation.	 Summary of Conservation Measures¹ above if construction occurs during the spring and fall migration periods. Should a whooping crane be sighted within 0.5 mile of a work area, all work will cease until the whooping crane leaves that immediate area. Service and NGPC will be contacted immediately and notified of the presence of whooping crane. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur. Should HDD activities occur at night, Keystone will down-shield lights. Where practicable, Keystone will maintain vegetative screening at HDD sites to prevent disturbance of northern long-eared bats. Keystone will ensure that no tree removal will occur within 0.25 miles of a known occupied hibernaculum. Keystone will ensure that no tree removal will occur within 150 feet of a known occupied maternity roost tree during the pup season (June 1-July 31) Keystone will complete pre-construction presence/absence surveys if there is a need to remove trees within potentially suitable habitat within the Project area during the pup season (June 1 to July 31). If required, surveys will be conducted nursuant to local Service field office.
				 will be conducted pursuant to local Service field office and state resource agency requirements. The need for additional season tree-clearing restrictions, if any, will be determined in coordination with applicable state and Federal resource agencies, pending survey results. During aerial surveillance, Keystone's aircraft will maintain at least 1,000 feet of elevation.

SpeciesESA Section 7 DeterminationService ConcursRationale	Summary of Conservation Measures ¹	
	Keystone will prepare and implement a project-specific SPCC Plan.	
Topeka shiner Not Likely to Adversely Affect Yes Keystone has committed to implementing conservation measures, conducting pre-construction surveys, and avoiding effects on individuals within occupied streams. • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • • •	Keystone's crossing of Union Creek will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater. Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur. Keystone will complete pre-construction presence/probable absence surveys of Union and Taylor creeks will be completed during the year of construction. Keystone will use a dry crossing method or HDD if the Topeka shiner is identified during pre-construction surveys. Keystone will ensure that water required for HDD operations or hydrostatic testing will be sourced from locations without Topeka shiner presence. Keystone will maintain at least a 100-foot setback from the water's edge for any HDD drill pads, should the HDD method be used. Keystone will implement best management practices (BMPs) outlined in the CMRP to prevent and minimize sediment runoff from construction areas from entering receiving streams that may provide potentially suitable Topeka shiner habitat. Keystone will avoid use of broadcast applications of pesticides or herbicides near water bodies. Keystone will avoid water depletions within occupied river basins. Keystone will maintain upstream and downstream fish	

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
				•	Keystone will screen the intake end of any water withdrawal pump with mesh having openings no larger than 0.125 inch. Water velocity at the screen will not exceed 0.5 feet per second, and the intake screens will be checked periodically for fish impingement. Should a Topeka shiner become impinged against the screen, all pumping operations will immediately cease and the compliance manager for Keystone will immediately contact the Service to determine if additional protection measures will be required. An environmental inspector will be present every day during water withdrawals to ensure compliance with permit conditions and to ensure that Keystone's commitments are met.
Western prairie fringed orchid	Not Likely to Adversely Affect	Yes	Surveys in 2019 and previous years have demonstrated the probable absence of this species from the pipeline construction corridor. Desktop studies have indicated that it is unlikely that individuals or high-quality habitat would occur in power line corridors. Given that pre-construction surveys will occur and Keystone has committed to implement avoidance and conservation measures, adverse effects are unlikely.	•	Keystone or the electric power providers will conduct pre- construction presence/probable absence surveys within potentially suitable habitat that was not previously surveyed, including the power line route to PS-21. Survey results will be submitted to the Service for review. Species presence will be assumed in potentially suitable habitat if surveys cannot be conducted during the flowering period. Keystone or the electric power providers will conduct pre- construction presence/probable absence surveys in potentially suitable habitat along the power line routes to PS-22 through PS-25, during the appropriate flowering period. The NPPD will delineate and designate areas where western prairie fringed orchid habitat is present as "avoidance areas" where placement of structures and construction traffic will not occur. Keystone's Project alignment will be adjusted to avoid any identified populations as practicable and/or approved by the landowner.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 To the greatest extent practicable, Keystone will reduce the width of the construction ROW in areas where western prairie fringed orchid populations have been identified. Keystone will implement a noxious and invasive weed control program consistent with the CMRP to reduce the potential for spread or invasion of weeds. Keystone will conduct any necessary herbicide application by spot spraying. Keystone will restrict use of herbicides within 100 feet of documented western prairie fringed orchid occurrence. Keystone will minimize the potential for altered hydrology (e.g., surface water flow, infiltration and groundwater levels) in potentially suitable habitat through BMPs outlined in the CMRP. Keystone will salvage and segregate topsoil appropriately where populations have been identified to preserve native seed sources in the soil for use in revegetation efforts in the ROW. Keystone will restore wet meadow habitat using a Service- and NGPC-approved seed mix. Keystone will monitor restoration of construction-related impacts on wet meadow habitats identified as potentially suitable for the western prairie fringed orchid for a 5-year period. Keystone has sited aboveground facilities to avoid potentially suitable western prairie fringed orchid wetland habitat. Keystone will implement a project-specific SPCC Plan. Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel
				storage, and vehicle fuel transfers.

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
				 These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite. Keystone will refuel and lubricate construction equipment in uplands and greater than100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities. Keystone will perform all equipment maintenance and repairs in upland locations at least 100 feet from waterbodies and wetlands. Keystone will park all equipment at least 100 feet from a watercourse or wetland overnight, if possible. Keystone will conduct construction and restoration activities to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Keystone will ensure each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials. Keystone will ensure water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow. Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits.

Keystone	XI
Reystone	11L

Species	ESA Section 7 Determination	Service Concurs	Rationale	Summary of Conservation Measures ¹
Species Black- footed ferret	ESA Section 7 Determination	Service Concurs Yes	Rationale No presence of black-footed ferrets (BFF) within the action area; little or no suitable habitat (prairie dog towns) which BFF depend upon would be affected, the Service determined effects on prairie dogs do not effect BFF where its known to occur; BFF is not known to exist outside of known re-introduced locations and surveys are no longer required; closest known reintroduction site is 19 miles from the action area, where a protected reintroduced population exists; there is little to no possibility of the species presence within the action area. Black-tailed prairie dog towns in all of South Dakota have been block-cleared by the Service's Pierre Ecological Services Field Office, meaning the towns no longer contain any wild, free-ranging black-footed ferrets, and activities within these areas that result in the	 Summary of Conservation Measures¹ Water will be returned to its source within a 30-day period except where hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source. Keystone will provide the Service with the results of Montana prairie dog town surveys and continue to coordinate with the Montana Ecological Services Office to determine the need for black-footed ferret survey, in accordance with the Black-footed Ferret Survey Guidelines (USFWS 1989). Keystone will prohibit workers from keeping domestic pets in construction camps and/or worksites. Keystone will make workers aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas). Keystone will report concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) to the appropriate state and Federal agencies. Keystone will implement a Project-specific SPCC Plan. Electrical power providers will implement protection measures to minimize raptor (BFF predators) perching, in accordance with the Avian Power Line Interaction Committee (APLIC), Suggested Practices for Avian Protection on Power Lines (APLIC 1996, 2012).
			within these areas that result in the removal of the black-tailed prairie dogs and/or their habitat would no longer be required to meet the Service survey guidelines for black-footed ferrets or undergo consultations under section 7 of the ESA.	 Protection on Power Lines (APLIC 1996, 2012). Big Flat Electric Cooperative will provide immediate notification to the Service in the unlikely event that a black-footed ferret is sighted during construction of the power line to PS-09.

Key	vstone	XI.
ILC	ystone	111

Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
Pallid Sturgeon	Not Likely to Adversely Affect	Yes	Adverse effects to pallid sturgeon are unlikely based on Keystone's plan to use the HDD crossing method for large rivers and Keystone's commitment to follow conservation measures, including restrictions on water withdrawals. None of the potential effects would occur on or near Federal lands, except possibly where the BLM and USACE are involved with the crossing under the Missouri River just below the Fort Peck Project.	•	Keystone will use HDD under the Milk, Missouri, Yellowstone, and Platte rivers. Keystone will use at least a 100-foot setback from the water's edge for the HDD drill pads at the HDD crossings at the Milk, Yellowstone, Missouri, and Platte rivers. Keystone will contain potential releases during HDD (frac-outs) by BMPs that are described within the HDD contingency plans required for drilled crossings. Keystone will avoid broadcast applications of pesticides or herbicides within 0.25 miles of water bodies. Keystone will maintain upstream and downstream fish passage during any stream habitat disturbance. Keystone will screen the intake end of any water withdrawal pump with mesh having openings no larger than 0.125 inch, a floating surface intake would be used to avoid the benthic habitat used by the sturgeon; water velocity at the screen would not exceed 12 centimeters per second to prevent entrainment of larval fish, and the intake screens would be periodically checked for fish impingement. Should a sturgeon become impinged against the screen, all pumping operations would immediately cease and the compliance manager for Keystone would immediately contact the Service to determine if additional protection measures would be required. Keystone will avoid water withdrawal from the Milk, Missouri, and Yellowstone rivers for any purpose from May 15 through July 15 of any year to avoid pallid spawning periods and the impingement and entrainment of free embryos and larval pallid sturgeon that drift with the current during that time of year. Keystone will avoid water withdrawal from the Platte River for any purpose from March 1 through June 30 of any year to avoid pallid spawning periods and the

			1		
Species	ESA Section 7 Determination	Service Concurs	Rationale		Summary of Conservation Measures ¹
Species	Determination	Concurs		•	impingement and entrainment of free embryos and larval pallid sturgeon that drift with the current during that time of year. Keystone would take care during the discharge to prevent erosion or scouring of the waterbody bed and banks to avoid impacts to spawning habitat for the species. Hydrostatic test discharge would be in upland locations near the source of the water. Water would be discharged over several days and through a hay bale apparatus or other velocity reduction and erosion control device. Keystone will avoid temporary water reductions based on Keystone's plan to withdraw the volume needed and to return water back to its source within a 30-day period for the Platte River. Keystone will cross major rivers using the HDD method with a pipeline burial depth of 25 feet or greater below the river bed to avoid direct impacts to habitat. Proposed HDD entry and exit points are more than 600 feet from the Platte River; if these points are changed, Keystone would maintain at least a 100-foot setback from the water's edge. Keystone will implement measures identified in a required HDD contingency plan, including monitoring of the directional drill bore, monitoring downstream for evidence of drilling fluids and mitigation measures to address a frac-out should one occur.
					intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and
					require heavier wall pipe be used for the HDD method.

The Service anticipates that the Project may result in minor or temporary disturbance to the listed species or their habitat described in Table 1 within the action area. However, adverse effects to these species are not anticipated due to: (1) the avoidance of the species' suitable habitat; (2) the low likelihood of disturbance that may occur as a result of the proposed project; and (3) the application of conservation measures intended to avoid/minimize impacts for each of these species and associated compliance monitoring by Keystone (BLM 2019, Appendix D). Therefore, these species will not be addressed further in the attached Biological Opinion.

The Service concurs with the determination that the Project may affect and is likely to adversely affect the ABB. Therefore, the final BO analyzes the effects of the entire Project on the ABB. This includes all consequences to ABB that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. No critical habitat has been designated for the ABB. The ITS serves to enumerate or identify the amount or extent of take "caused by" all the effects of the action and exempts the action agencies from the prohibitions against that take under section 9 of the ESA. Here, take of ABB would not occur "but for" the proposed Federal actions. Given the scope of the effects of the Federal actions, it follows that the majority of the take exempted for the Federal agencies is occurring on lands that are outside the jurisdiction of the Federal agencies, or is related to activities undertaken by the applicant not under the authority of a Federal agency.

Because the majority of take associated with the proposed Project will occur on non-federal lands and is outside the jurisdiction of the Federal agencies, Keystone has elected to apply for an incidental take permit and develop a habitat conservation plan for the ABB. Therefore, the incidental take permit will authorize the incidental take that results from Keystone's covered activities. As appropriate, the Service may utilize the analysis in this BO when it processes the application for an incidental take permit for Keystone.

If you have any questions regarding this matter, please contact me at the letterhead address or by phone at (303) 236-4774.

Sincerely,

Colorado and Nebraska Field Supervisor

Enclosure

- cc: Rebecca Latka, Regulatory Field Support, U.S. Army Corps of Engineers
 Heath Kruger, Chief of Natural Resources, U.S. Army Corps of Engineers
 Mark A. Gabriel, Administrator and Chief Executive Officer, Western Area Power
 Administration
 - Jody Sundsted, Senior Vice President and Regional Manager, Upper Great Plains Region, Western Area Power Administration

Dennis Rankin, Environmental Protection Specialist, Rural Utilities Service

Literature Cited

Avian Power Line Interaction Committee (APLIC). 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute and the Raptor Research Foundation. Washington, D.C.

Avian Power Line Interaction Committee. 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Nebraska Game and Parks and U.S. Fish and Wildlife Service. 2017. Interior Least Tern and Piping Plover Survey Protocol, February 2017.

Nebraska Natural Heritage Program (NNHP). 2019. Conservation and Environmental Review Tool (CERT) Project Report and GIS files. Received January 11, 2019.

South Dakota Natural Heritage Program (SDNHP). 2019. Element Occurrence GIS Shapefile. Received January 8, 2019.

United States Fish and Wildlife Service (Service). 2019. Whooping Crane Tracking Project. Nebraska Ecological Services Field Office.

United States Fish and Wildlife Service. 2017. Nebraska Ecological Services Field Office, Provisional Whooping Crane Telemetry Project Database 2010-2016.

United States Fish and Wildlife Service. 2016. Programmatic Biological Opinion on the "Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions, January 5, 2016. Available at: https://www.fws.gov/midwest/endangered/section7/batbo/16 NLEBRange Final4d01052016.pdf

United States Fish and Wildlife Service. 1989. Black-Footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. U.S. Fish and Wildlife Service. Denver, Colorado and Albuquerque, New Mexico. 10 pp. + Appendices.

United States Bureau of Land Management. 2019. Amended Biological Assessment for the Keystone XL Project. November 26, 2019. Received by the Service on November 27, 2019.

BIOLOGICAL OPINION ON THE EFFECTS OF THE PROPOSED KEYSTONE XL PIPELINE TO THE FEDERALLY ENDANGERED **AMERICAN BURYING BEETLE** Nicrophorus americanus

TAILS No. 06E22000-2020-F-0052

Consulting Agencies: Bureau of Land Management Western Area Power Administration **Rural Utilities Service U.S. Army Corps of Engineers**

Biological Opinion Prepared by: U.S. Fish and Wildlife Service

Project Leader, Colorado and Nebraska Field Office

Date DEC 23 2019

Ŷ

TABLE OF CONTENTS

TABLE OF CONTENTS	2
INTRODUCTION	3
CONSULTATION HISTORY	4
BIOLOGICAL OPINION	5
DESCRIPTION OF PROPOSED ACTION	5
Action Area	10
Description of the Proposed Project	
Conservation Measures for the American Burying Beetle	13
Mitigation Measures Proposed for the American Burying Beetle	16
STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE	17
Status and Distribution	17
Threats	
Reproduction/Active Periods	19
Feeding	19
Habitat	20
ENVIRONMENTAL BASELINE FOR THE ACTION AREA	20
Status of the Species within the Action Area	20
Factors Affecting Species Environment within the Action Area	25
EFFECTS OF THE ACTION	27
Species Response to the Proposed Action	31
CUMULATIVE EFFECTS	
JEOPARDY DISCUSSION AND CONCLUSION	35
INCIDENTAL TAKE STATEMENT	
AMOUNT OR EXTENT OF TAKE ANTICIPATED	
EFFECT OF THE TAKE	40
REASONABLE AND PRUDENT MEASURES	40
Procedures for Handling and Disposing of American Burying Beetles	40
REINITIATION NOTICE	41
LITERATURE CITED	42

INTRODUCTION

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion (BO) on the proposed Keystone XL Pipeline Project (Project) under section 7 of the Endangered Species Act (ESA) based on our review of the Bureau of Land Management's (BLM) Biological Assessment for all Federal agency actions associated with the Project proposed by the applicant, TC Energy (formerly known as TransCanada) Keystone Pipeline, LP (Keystone). A Biological Assessment (hereafter referred to as the BA) was submitted by the BLM on September 30, 2019. An amended BA was submitted by BLM on November 27, 2019 (BLM 2019). This BO is prepared in accordance with section 7 of the ESA (16 U.S.C. 1531-1544, 87 Stat. 884), as amended).

The purpose of section 7 consultation is to ensure that any action authorized, funded, or carried out by the Federal government is not likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat of the species. Consistent with the regulations at 50 C.F.R. §402.12(f), the BA analyzed the effects of the entire action, regardless of whether the actions are Federal or non-federal. For this Project, the Federal actions are by BLM, Western Area Power Administration (WAPA), Rural Utilities Service (RUS), and the U.S. Army Corps of Engineers (USACE). Although this BO evaluates effects on the federally listed American burying beetle [Nicrophorus americanus], (hereafter referred to as "ABB" or "beetle") described in the BA for the entire Project, the area where the adverse effects and incidental take of the ABB occurs is on non-federal lands and primarily outside the scope of Federal agency authority. Keystone has decided to develop a Habitat Conservation Plan (HCP) to support its application to the Service for a section 10(a)(1)(B) incidental take permit for the ABB for their activities on non-federal lands or lands without a Federal nexus. Keystone has submitted a draft HCP to the Service for review and technical assistance. The HCP and section 10 process is separate from this BO, though the Service might utilize the analysis in this BO, as appropriate, when it processes the permit application.

The Federal agencies determined that the Project may affect the threatened northern long-eared bat (NLEB; Myotis septentrionalis). The Service's 2016 final 4(d) rule for NLEB (81 FR 1900) prohibits incidental take only under the following circumstances: 1) if it occurs within a hibernaculum, or 2) if it results from tree removal activities and the activity occurs within 0.25 mile (0.4 km) of a known hibernaculum; or, the activity cuts or destroys a known, occupied maternity roost tree or other trees within a 150 foot radius from the maternity roost tree during the pup season from June 1 through July 31. No actions or impacts from the Project are anticipated to NLEB hibernaculum. Keystone has committed that 1) no tree removal will occur within 0.25 miles of a known occupied NLEB hibernaculum, 2) no tree removal will occur within 150 feet of a known occupied NLEB roost tree during the pup season (June 1-July 31), and 3) if there is a need to remove trees during the pup season, pre-construction presence/absence surveys will be completed by Keystone, pursuant to local Service field office and state resource agency requirements (see NLEB row in Table 1 of the BO Transmittal Letter). Therefore, the actions associated with the Project would not cause prohibited incidental take to the NLEB. To fulfill the Federal agencies' section 7(a)(2) consultation obligation, this Project relies on Service's January 5, 2016, Programmatic Biological Opinion on the "Final 4(d) Rule

for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions (Programmatic Biological Opinion) (Service 2016, entire)." The Programmatic Biological Opinion provides a framework for streamlined section 7 consultation for other Federal actions that may affect the NLEB and are consistent with the provisions of the 4(d) rule. The Service has determined that the Federal agencies have appropriately utilized the framework within the Programmatic Biological Opinion, and therefore does not further discuss NLEB in this BO.

This BO is based on best scientific and commercial data available including information provided in the BA (BLM 2019), the Supplemental Draft Environmental Impact Statement (SDEIS), draft HCP (Keystone 2019), telephone conversations, meetings, field investigations, and other sources of information.

CONSULTATION HISTORY

The Service's Colorado/Nebraska Ecological Services Office in Lakewood, Colorado, is delegated the lead office to conduct the consultation with BLM. However, other Service Ecological Services Field Offices in Nebraska, Montana, North Dakota, South Dakota, and Kansas have been actively participating as part of the Project team during part or all of the informal and formal consultation, and assisted in drafting or reviewing consultation documents throughout the consultation. Consultation for the Project has been ongoing over an extended time period, and included a previous BA submitted by the Department of State in June 2012 (Department 2012), and a BO issued by the Service in 2013 (Service 2013, entire). The 2013 BO and 2012 BA on which it was based, and subsequent analysis for additional species, are no longer in effect; the Department of State and the Service withdrew the 2012 BA and 2013 Biological Opinion on May 6, 2019. For a complete list summarizing agency correspondence, species-specific survey information, and continued coordination with the Service regarding biological surveys and determination of biological effects for the Project, see section 1.3, Consultation History, and Appendix A, Letters of section 7 Consultation and Supporting Communications of the BA (BLM 2019, pp. 1-8; Appendix A).

Since May 2019, the Service, BLM, WAPA, RUS, USACE, and the Department of State has held twice weekly conference calls to discuss the consultation. A meeting with the Service, BLM, WAPA, RUS, and USACE was held on September 19-20, 2019, to discuss remaining issues associated with the development of a BA. On September 30, 2019, BLM and the additional Federal agencies submitted a BA to the Service with a letter requesting initiation of formal consultation. On November 27, 2019, BLM submitted an amended BA (BLM 2019) to the Service to update information provided in the previous BA.

Updates to the Project and Analysis

Since the 2013 BO, several issues related to the Project have been modified. The Department of State no longer has an action requiring section 7 consultation. However, Federal actions involving the BLM, WAPA, RUS, and the USACE, still require section 7 consultation. When a particular action involves more than one Federal agency, the consultation and conference responsibilities may be fulfilled through a lead agency for section 7 consultation. The Service is notified of the designation in writing by the lead agency (50 CFR 402.07). The BLM has not

notified the Service in writing that it is assuming the designation of lead agency, but has provided the Service the information necessary to complete section 7 consultation for the Federal actions associated with this Project (BLM 2019). A portion of the Project in Nebraska has been rerouted to avoid impacts to sensitive areas and to maximize the use of existing rights of way (ROWs). This new route segment, designated as the Mainline Alternative Route (MAR), is discussed in detail in the 2018 MAR Draft SEIS (Department 2018, entire). The Project footprint through Montana and South Dakota, and the 60-acre pipe yard in North Dakota, are essentially the same as that reviewed and assessed in the 2012 BA and 2013 BO for the previously proposed project.

The BA (BLM 2019) includes the most recent species survey information. This also included additional whooping crane public sightings and telemetry data, and assessment of effects to any listed species as a result of new information. The Project includes updated standard practices related to ABB conservation measures based on the Service's most recent recommendations. Efforts to "capture and relocate" ABB near the Project footprint are no longer considered a beneficial practice for reducing harm to ABB (see additional detail in CONSERVATION MEASURES section of this BO). While this practice was proposed and incorporated into the 2013 BO and 2012 BA to reduce ABB mortality (anticipated as harassment instead), it is no longer proposed as part of this Project.

The BA (BLM 2019, pp. 116-118) also considered updated information from Hoback and Conley (2014, entire) which suggested changes in temperature could impact ABB overwintering behavior and survival. In the 2013 BO, incidental take was estimated as a one-time permanent impact for the pipeline's operations in the right-of-way. However, the BA (BLM 2019, p. 124) anticipated and estimated annual mortality from temperature changes due to pipeline operations over the entire duration of the 46 years of the Project after restoration is completed (four years). This results in take estimates during operations 46 times larger than those that would be expected using similar data and methods from the 2013 BO. Additionally, methods of calculating ABB density from survey efforts have been updated since the 2013 BO. ABB density calculations no longer include a habitat quality weighting factor (i.e., a multiplier used to account for habitat quality at location of survey), as densities are calculated using trapping results in mostly highquality habitats (prime and good). The Service therefore determined that ABB densities are already conservatively high and do not require additional weighting based on habitat quality. The estimate of individuals affected per acre is intended to be conservative. Further information on the type of effects and estimates for take are provided in the EFFECTS OF THE ACTION and INCIDENTAL TAKE STATEMENT in this BO.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

As defined in the ESA section 7 regulations (50 CFR 402.02), "action" means "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." Examples of Federal actions include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of

regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air.

Proposed Federal Actions

Several Federal agencies are involved in some capacity with the Project. The BLM, the WAPA, the RUS, and the USACE intend to rely on this document to comply with section 7 of the ESA. The following sections describe the proposed Federal actions associated with the Federal agencies described above. Figure 1 indicates the currently known approximate locations that are subject to the proposed Federal actions.

BLM

The BLM's proposed Federal action evaluated in this BO is the BLM's decision to issue a ROW grant and Temporary Use Permit to construct, operate, maintain and decommission a crude oil pipeline and related facilities on Federal lands in compliance with the Mineral Leasing Act, BLM ROW regulations, and other applicable Federal laws. In coordination and concurrence with USACE. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant and Temporary Use Permit for the proposed Keystone XL pipeline system, and if approved, under what terms and conditions. The proposed pipeline ROW would cross approximately 44.4 miles of BLM land in Montana and would also cross approximately 1.88 miles of USACE land at the Missouri River at Fort Peck, Montana.

WAPA

Part of WAPA's mission is to provide open access to transmission services across the Federal power transmission system so that energy producers can transmit power to their customers. Any entity requesting transmission services across the Federal grid system must submit an application for interconnection. WAPA has received interconnection applications from local power cooperatives to serve the electrical needs of Pump Station (PS)-09 through PS-13 and PS-17 through PS-19, as well as PS-21.

The proposed interconnections to WAPA's transmission system are Federal actions. As a result, WAPA must evaluate the environmental impacts of entering into an interconnection agreement and completing any necessary work to WAPA's infrastructure to accommodate the interconnections as well as any interrelated non-federal actions (e.g., construction of power lines). The following provides a summary of WAPA's Federal activities:

- PS-09—Construction and ownership of a new substation (the Bowdoin Substation) and interconnection;
- PS-10—An expansion of the existing Fort Peck Substation and interconnection;
- PS-11—Construction and ownership of a new substation and interconnection;
- PS-12—Interconnection and minimal work within the existing Circle Substation footprint to accommodate the interconnection;
- PS-13—An expansion of the existing O'Fallon Substation and interconnection;

- PS-17—Interconnection and minimal work within the existing Maurine Substation footprint to accommodate the interconnection;
- PS-18—Interconnection and minimal work within the existing Philip Substation footprint to accommodate the interconnection;
- PS-19—Expansion of the existing Midland Substation and interconnection; and
- PS-21—Rebuilding of the existing Gregory Substation and interconnection.

Additional information and analysis related to the power lines that would connect to the abovementioned substations is provided in the analysis to follow.

RUS

RUS administers programs that provide rural areas with infrastructure and infrastructure improvements, including water and wastewater treatment, telecommunications services, and electric power. For electric power, RUS provides financing through loans and loan guarantees for the construction, operation, and improvement of electric transmission and generation facilities in rural areas. Power cooperatives in South Dakota have applied for RUS financing for the construction of power lines to deliver power to PS-15 through PS-21. The South Dakota power cooperatives include Grand Electric Cooperative (PS-15, 16, and 17), West Central Electric Cooperative (PS-18 and 19) and Rosebud Electric Cooperative (PS-20 and 21). RUS's action is to determine whether to provide Federal financing to these electric cooperatives, thus allowing them to construct and operate the transmission line facilities necessary to supply the Project's pump stations with power.¹

¹ The power cooperatives could identify and secure alternate financing if RUS decides not to provide financing.



Figure 1. Location of Proposed Federal Decisions as presented in the BA (BLM 2019, p. 13)

USACE

The Project, as described in section 2.6 of the BA (BLM 2019, p. 15) would cross Federal lands administered by the BLM, as well as Federal land administered by the USACE for the Fort Peck Project. As required by 33 USC 408, the USACE must give permission for the BLM to include the Fort Peck Project lands in a ROW granted to Keystone the Project on Federal land administered by both agencies. The USACE may also consider, whether to issue general permit verifications or permit approvals under section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403) for any pipeline or power line construction over, under, or through navigable waters listed under section 10, and/or under section 404 of the Clean Water Act (33 USC 1344) for Project activities involving dredging or filling in rivers, streams, or wetlands.² Based on pre-application meetings held with the applicant, USACE anticipates receiving preconstruction notifications (PCNs) along with a request for permit review from Keystone once section 7 ESA consultation is completed with Service. The USACE expects PCNs for pipeline crossings at the Missouri River, and the Yellowstone River, which are both section 10 rivers, as well as other rivers not subject to section 10 but within the general alignment of the Project. Additional PCNs may be submitted for USACE review along other portions of the Project. If any PCNs are submitted for activities in Nebraska, USACE's decisions on potential section 404 verifications would be the only Federal decisions made in the state of Nebraska for the Project. However, submittal of new PCNs within the current pipeline ROW should not impact the USACE's compliance with ESA section 7 or the analysis in this BO, as it encompasses all USACE-related permitting decisions.

Summary of Proposed Federal Activities

Collectively, the proposed Federal actions comprise the decisions of the BLM, WAPA, RUS, and the USACE as described above. The Federal agencies are not proposing to construct or manage the Project; however, under section 7 of the ESA, any effects on ESA-listed species resulting from the construction and operation of the Project could be considered consequences of the proposed Federal actions. Therefore, the effects of the Project on protected species are evaluated as part of the effects of the proposed Federal action. Consistent with the regulations at 50 C.F.R. §402.02, the action area encompasses all areas affected by the Project, as described in section 2.6 of the BA and Appendix C of the BA (BLM 2019, p. 16; Appendix C).

² USACE regulates the discharge of dredged or fill material into waters of the United States under section 404 of the Clean Water Act, and the construction of structures and work in navigable waters of the United States under section 10 Rivers and Harbors Act. Therefore, typically USACE does not have authority for the operations phase of a project. Furthermore, per 33 C.F.R., 2017 Issuance and Reissuance of Nationwide Permits, Final Rule, USACE does not directly regulate oil and gas pipelines, or other types of pipelines. For utility lines, including oil and gas pipelines, USACE's legal authority is limited to regulating discharges of dredged or fill material into waters of the United States and structures or work in navigable waters of the United States, under section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act of 1899, respectively. USACE does not have the authority to regulate the operation of oil and gas pipelines, and does not have the authority to address spills or leaks from oil and gas pipelines.

Action Area

The action area is defined as "...all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action" (50 CFR 402.02). For the purposes of this BO, the Service determined that the action area is the pipeline ROW (temporary and permanent) and all areas encompassing the pipeline construction, operation, and maintenance activities, ancillary facilities, temporary workspaces, pipe stockpile sites, railroad sidings, contractor yards, construction camps, access roads, and other aboveground facilities, including pump stations and power lines.

The action area begins where the Project crosses the United States border from north to south near Morgan, Montana, and continues southeast to Steele City, Nebraska (Figure 2) (BLM 2019, pp. 17-20).



Figure 2- Proposed Project Overview (BLM 2019, p. 17)

Description of the Proposed Project

Keystone proposes to construct and operate a crude oil transmission system from an oil supply hub near Hardisty, Alberta, Canada, to destinations in the United States. In total, the Project would consist of approximately 882 miles of 36-inch diameter pipeline in the United States. The Project would have the capacity to deliver up to 830,000 barrels per day of crude oil.
As acknowledged in the 2014 Final SEIS, after completion of the analyses required under National Environmental Policy Act and under section 7 of the ESA, "Keystone will make minor adjustments to the proposed pipeline alignment during final design based on additional information obtained from field surveys or landowners. These minor route variations (microalignments) could be implemented to address specific landowner concerns, avoid certain features (such as structures, wells, or irrigation systems), minimize effects to environmental resources, or facilitate construction in such areas as steep terrain or waterbody crossings" (Department 2014, p. 2.1-2).

Proposed activities and a summary of Federal and non-federal lands where activities occur are summarized Tables 2.6-1 and 2.6-2 of the BA (BLM 2019, pp. 21-23). The installation of the proposed 36-inch diameter pipeline would occur within a 110-foot-wide construction ROW, consisting of a 60-foot temporary construction ROW surrounding a 50-foot permanent ROW. The ROW during construction will be reduced to 85 feet in certain areas due to restrictions regarding other features (e.g., wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas). Descriptions of additional temporary workspaces, construction camps, and access roads are included in Appendix C of the BA (BLM 2019).

The amount of land affected during construction would total approximately 13,090 acres, of which approximately 8,304 acres would be overlapped by permanent ROW and/or occupied by permanent facilities. After construction, the temporary ROW would be restored and returned to its previous land use. All disturbed acreage would be restored and returned to its previous aboveground land use after construction, except for the approximately 37 acres occupied by electrical substations and switching stations and the approximately 282 acres occupied by permanent access roads and aboveground facilities, including pump stations and valves, for the life of the Project.

Almost all of the land affected by the construction and operation of the Project would be privately owned. BLM oversees the management of the majority of the federally owned lands affected by the Project.

Keystone will use Environmental Inspectors on each construction spread. The Environmental Inspectors will review the Project activities daily for compliance with state, Federal and local regulatory requirements. The Environmental Inspectors will have the authority to stop specific tasks as approved by the Chief Inspector. They can also order corrective action in the event that construction activities violate the provisions of the Construction Mitigation and Reclamation Plan (BLM 2019, Appendix B), landowner requirements, or any applicable permit requirements. The compliance manager for Keystone would be the point person for communication with the USFWS as required. The monitors that would be used in the field would be reporting to the environmental inspectors, who in turn report to the compliance manager. If required, the monitors would discuss any required interpretation or issues with the USFWS and the compliance manager. More information is provided in the CONSTRUCTION MITIGATION AND RECLAMATION PLAN (BLM 2019, Appendix B) and the PROPOSED PROJECT DESCRIPTION (BLM 2019, Appendix C).

Electrical Transmission and Distribution Lines and Substations

Local, non-federal power providers (typically called utilities or cooperatives) will provide electrical service to the Project. In some instances, new and/or upgraded electrical transmission and distribution lines (power lines) and substations would be needed in order to deliver power. The local utility or cooperative will be responsible for constructing any such power lines or substations, as well as obtaining the necessary permits, approvals, or authorizations from Federal, state, and local governments. Further coordination between local power providers and applicable resource management agencies may be required to ensure the conservation of protected species and to obtain the necessary permits and approvals to construct and operate the power lines.

WAPA may need to construct new substation facilities or upgrade existing substation facilities to support the electrical service to for the Project. This BO evaluates the conservation measures that WAPA has committed to implement, as well as potential effects of WAPA Federal actions, including construction and upgrading substation facilities, on ABB. Table 2.6-3 in the BA provides a summary of the power line and substation information (BLM 2019, pp. 24-25). See Figure 1 for the location of these pump stations. Additional details are included in Appendix C of the BA (BLM 2019). Microalignments may change the lengths of pipeline and/or power line, areas of ROW, and the number of power line support structures, but would not likely result in a meaningful increase in these aspects of the Project.

Pipeline Incident Analysis and Emergency Response Plan

The likelihood of potential accidental or unexpected oil releases from the pipeline during operation was analyzed in the 2014 Final SEIS. This analysis has subsequently been updated using more recent information. A description of the updated pipeline incident analysis can be found in Appendix C of the BA (BLM 2019). However, the potential effects on ABB from potential spills are not reasonably certain to occur (50 C.F.R. §402.17) for reasons stated below (see Exposure to Potential Oil Spill and Emergency Repairs section of this BO).

A Project-specific Emergency Response Plan (ERP) will be prepared for the Project, which would be submitted to the Pipeline and Hazardous Materials Safety Administration (PHMSA) for approval prior to commencing system operations. A comprehensive ERP for the existing Keystone Pipeline Project has been reviewed and approved by PHMSA. The publicly available portion of the Keystone Oil Pipeline System ERP is included as BA Appendix D, Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan (parts of the ERP and the Pipeline Spill Response Plan are considered confidential by PHMSA and the U.S. Department of Homeland Security). As described in section 4.13 of the 2014 Final SEIS, the existing Keystone Oil Pipeline Project documents would be used as templates for the plans for the Project. Project-specific information would be inserted into the plans as it becomes available. More information on emergency response procedures is described in section 12, Emergency Response Procedures, Appendix C of the BA (BLM 2019).

Conservation Measures for the American Burying Beetle

Keystone, the electrical power providers, or WAPA, where specified below, will apply the following conservation measures to the extent practicable and allowed by landowners to avoid, minimize, and mitigate effects on the ABB and potentially suitable habitat for the species.

The following conservation measures will be implemented for the Project:

- Construction areas with ABB habitat will be mowed³ such that the vegetation is as low as possible without causing erosion (less than eight inches), in accordance with Nebraska Game and Parks Commission (NGPC) guidance (NGPC 2019a, entire). Mowing and raking away grass clippings allows the ground to dry out. Mowing will occur when the ABB is active, so depending on the ground disturbance timeframe, the period when these procedures will be implemented is from March 15 through October 31, based on NGPC guidance. For winter construction activities (October 31 to March 31) mowing would occur by October 15. Hand clearing or mechanical mowing will be used to mow uplands. Forested uplands will not be cleared ahead of mainline construction and wetlands and streams will also be avoided. This short vegetation height will be maintained for the duration of active construction during the ABB overall active period (until October 31) or until construction in the vicinity is completed, whichever is earlier. Mowing will be completed every few weeks, if necessary, to ensure vegetation is kept less than eight inches tall until grading commences. Once mowed, clippings will be removed. Possible methods include raking, windrowing (cutting rows of vegetation), or baling. If the grass has stopped growing, or grading commences, mowing can stop. All construction work vehicles, and personal vehicles will be staged in mowed areas. If it is not possible to maintain vegetation under eight inches in height, construction will avoid such areas until the vegetation can be mowed to less than eight inches in height. For power line construction in potentially suitable ABB habitat, the electric power providers will mow only in construction areas with soil disturbance (pole installation), as recommended by the Service and NGPC. Once mowing procedures have been initiated, weekly reports will be kept and submitted to the Service, NGPC, and South Dakota Game, Fish, and Parks (SDGFP). These reports will demonstrate that the conservation measures are being implemented and become part of the records. Weekly reports are only required during the ABB active period (April 1 to October 31) while construction on the Project is active. Photos documenting grass heights will be provided.
 - For the above mowing conservation measure, Keystone will implement in pipeline construction ROW, the electric power providers will implement in power line ROW,

³ The purpose of mowing construction areas is to ensure that ABBs are not attracted to the active construction site. NGPC recommends mowing construction areas 2 weeks prior to the commencement of ground disturbing activities between these dates. Willemssens (2015, entire) conducted numerous experimental tests and found burying beetles were significantly less likely to bury in construction zones and concluded that mowing as a pre-work conservation measure should reduce the number of ABBs present.

and WAPA will implement for the substation that would serve PS-21 in South Dakota.

- The work areas in ABB habitat will be prepared by removing any and all carcasses⁴ prior to • construction, in accordance with NGPC guidance (NGPC 2019a, entire). Carcasses as small as songbirds, snakes, and rodents are ideal food for the ABB; therefore, this removal activity will be thorough. Carcass removal will occur between March 15 and October 31 or until construction is completed, whichever is earlier. Personnel will survey the ROW daily to remove carrion. Carcass removal can be done at any time throughout the day; however, the preferred timing is in the late afternoon, since the ABB is active at night. This will ensure that ABBs are not drawn to the area by roadkill caused by daytime traffic. Disposal of carcasses will be at least 0.5 miles away from the work site. For power line construction in potentially suitable ABB habitat, electric power providers will remove carrion only in construction areas with soil disturbance (pole installation), as recommended by the Service and NGPC. Carrion removal reports will be submitted as with the mowing reports. Once carrion removal procedures have been initiated, weekly reports will be kept and submitted to the Service, NGPC, and SDGFP. These reports demonstrate that the conservation measures are being implemented and become part of the records. Weekly reports are only required during the ABB active period (April 1 to October 31) while construction on the Project is active. If the number and species of carrion can be easily identified (for example, deer carcass, bull snake, mouse, etc.), this information will be included in the report. Photo documentation of carrion removed will be provided.
 - For the above carrion removal conservation measure, Keystone will implement in pipeline construction ROW, the electric power providers will implement in power line ROW, and WAPA will implement for the substation that would serve PS-21 in South Dakota.
- During the construction phase, most of Keystone's construction activity will take place in daylight hours. Construction activities taking place at night would require artificial lighting and could thereby have an effect on ABB by disruption of normal behavior patterns. Construction at night and the use of lights will be limited to specific situations requiring this activity such as critical tie-ins (connection of a pipeline to a facility, other pipeline systems, or different sections of a pipeline), Horizontal Directional Drilling (HDD) sites, and during certain weather conditions. Where such activities require lighting, the lights will be down shielded and utilize warm amber-colored lights with a color temperature of 3000 K or less and intensity no greater than 70,000 lumens. Lighting required for contractor yards and pump stations will also be down shielded (to prevent unnecessary upward illumination), except where required for safety and security, and will utilize sodium vapor or LED lighting meeting the above specifications.

⁴ Removing carrion (essential for ABB feeding and reproduction) will make the work area less attractive to the ABB. By removing carrion in areas where construction would occur, this ensures that ABB would not be feeding or burying carcasses in an area where they could encounter construction equipment.

- Keystone will implement an education program for construction personnel engaged in the Project. This will include a presentation focused on identifying the ABB, explaining its life history, its current range, and its habitat requirements. Pipeline construction personnel will be instructed to report any sightings of ABB or brood chambers if encountered. Education cards will be provided to all construction personnel. Signs will be placed at construction entrances identifying the area as potential ABB habitat.
- Immediately following construction, Keystone will rip (mechanically break up) soils in disturbed areas on the temporary pipeline ROW to a depth of 24 inches to relieve soil compaction existing at the site from the use of heavy equipment. This effort will improve or enhance ABB habitat by making soils easier for ABBs to bury in. Keystone's Construction, Mitigation, and Reclamation Plan (CMRP) in Appendix B of BLM (2019) provides further details with regard to relief of soil compaction within ROWs following construction.
- Keystone will implement erosion control techniques such as silt fencing, hay bales, water bars, and other efforts to prevent washing away of topsoil, formation of gullies, or other erosion that could negatively affect ABB habitat through the action of surface water. Keystone's CMRP (BLM 2019, Appendix B) provides further details with regard to erosion control following construction.
- Immediately following pipeline construction, Keystone will temporarily stabilize disturbed areas by broadcasting cool season species such as annual rye grass or wheat seed. Where necessary, clean, weed-free wheat straw will be used as mulch to protect seed and increase soil moisture. These grasses are annual species that senesce when temperatures warm during summer; they will not become permanently established. During the spring, a mixture of native warm season grasses will be planted within the ROW. This will include species such as little bluestem, big bluestem, Indiangrass, and switchgrass. Natural recruitment of other native grasses and forbs will also occur. It should be noted that some portions of the ROW. in response to landowner requirements, will be revegetated using non-native species such as smooth brome. This type of re-vegetation will likely be restricted to areas that are currently dominated by improved grass pastures and will therefore not lead to a reduction of habitat dominated by native species. In the limited circumstance where landowners request revegetation of previously native vegetation to non-native vegetation, Keystone will consider this as a permanent effect on habitat and will provide appropriate mitigation for those areas, unless those areas are subject to other conditions from USACE. Keystone's CMRP (BLM 2019, Appendix B) provides further details with regard to restoration of pipeline ROWs following construction.
- Keystone is committed to habitat restoration following construction. The ABB monitoring program will provide assurances that the acres disturbed would be restored appropriately. Failure is unlikely due to Keystone's commitment to re-seed in subsequent years if unsuccessful after the first growing season. Criteria for successful reclamation are: 1) reclamation will be measured four years after the commencement of construction; 2) for reclamation to be deemed successful, native grasslands restored on the ROW must be

comparable to those on adjacent undisturbed lands; 3) 70 percent of the dominant species on the ROW must be the same as those that occur on adjacent off-ROW lands.

• The Nebraska Public Power District (NPPD) and Rosebud Electric Cooperative will schedule power line and switching station construction activities during the ABB dormant or inactive time⁵ (October 31 to March 31). The power providers will coordinate with Service and NGPC to determine appropriate measures to minimize potential effects if such scheduling cannot be accomplished due to unexpected circumstances, including weather delays.

The Service previously recommended project proponents "capture and relocate" ABB near a project footprint to remove ABBs from the project area prior to project implementation and associated impacts. However, this conservation measure is no longer considered a beneficial practice for reducing harm to ABB. Hoback and Conley (2014, p. 56) found that capturing and relocating burying beetles near the project site may not remove all beetles prior to impacts, as other beetles may recolonize the project site following the capture and relocation effort. The risks associated with attracting additional ABB to a project site, as well as handling them during the trapping and relocating (can result in additional adverse effects), may outweigh the benefits (Hoback and Conley 2014, p. 61).

Mitigation Measures Proposed for the American Burying Beetle

Keystone is committing to mitigate the impacts to ABB as part of the proposed action. However, because the take of ABB will occur on private lands, Keystone has submitted a draft HCP in support of an application for an incidental take permit to minimize and mitigate the impacts to ABB to the maximum extent practicable (a permit issuance criteria). Goal 2 of Keystone's draft HCP (Keystone 2019, p.110) is to provide permanent compensatory mitigation of ABB impacts not avoided by other conservation measures. To achieve this goal, Keystone aims to protect, in perpetuity, an amount of occupied ABB habitat based on the mitigation ratios described in the draft HCP (Keystone 2019, p. 114) via an approved conservation bank; or, if conservation banks are not available, provide funds to third-party for: (1) purchase of land to provide habitat for ABBs; and (2) restoration and long-term management of the property. Keystone agrees to mitigate impacts of the taking of ABB by acquiring and protecting suitable habitat lands in perpetuity prior to start of construction. Keystone is in the process of retaining the Conservation Fund to work with the Service and Keystone to identify lands for either a conservation easement or purchase.

ABBs are nocturnal (Service 1991, p 11) and have a limited active season (Service 2019a, p. 10), making them difficult to detect (see <u>Status and Distribution</u> section below in the BO). Therefore, rather than use ABB survey data to determine ABB presence, Keystone selected to use a conservative approach and assumes that ABBs may occupy all suitable habitat within the documented ABB range, for all habitats rated marginal to prime (only poor habitat rating

⁵ Construction during the dormant or inactive season minimizes impacts to ABB due to reduced frozen soils compacting less and ABB being underground, further from the soil surface. This reduces the potential for crushing and disturbing individuals.

excluded). Keystone will provide mitigation in perpetuity for temporary and permanent impacts to habitat. Mitigation for temporary impacts offset the impacts of lost habitat during the time period habitat restoration is occurring at the impact site. Additional mitigation is also provided to cover the unlikely event of unsuccessful restoration as described in section 9.3.3 (Keystone 2019, p. 114). Based on the mitigation ratios presented in the HCP (Keystone 2019, p. 114), the calculated total of mitigation acres is 1,034.03 acres (Keystone 2019, p. 116). This measure is intended to offset the impacts of take from the Project, including temporary and permanent loss, degradations, and fragmentation of ABB habitat. Table 25 in the draft HCP (Keystone 2019, p. 115) details the number of impacted and mitigation acres for permanent and temporary impacts and by state. Table 26 includes mitigation for power line impacts (Keystone 2019, p. 116).

STATUS OF THE SPECIES AND CRITICAL HABITAT RANGEWIDE

Status and Distribution

The ABB was listed as endangered on July 13, 1989 (54 FR 29652; Service 1989, entire) based on a drastic decline and extirpation over nearly its entire range. The Service prepared a recovery plan in 1991 (Service 1991, entire) and a Species Status Assessment Report in 2019 (SSA report; Service 2019a, entire). On May 3, 2019, the Service published a proposed rule and 12-month petition finding to reclassify the ABB from endangered to threatened with a 4(d) rule (84 FR 19013). The Service has not designated critical habitat for this species. During the 20th century, the ABB disappeared from over 90 percent of its historical range (Lomolino et al. 1995, p. 606) which covered most of temperate eastern North America. The species was formerly distributed throughout 35 states and three Canadian provinces (Ratcliffe 1996, p. 60) but is believed to be extirpated from all but nine states in the U.S. and likely from Canada. The ABB is now known to occur in portions of Arkansas, Kansas, Oklahoma, Nebraska, South Dakota, Texas (not documented since 2008), on Block Island off the coast of Rhode Island; and reintroduced populations on Nantucket Island off the coast of Massachusetts, southwest Missouri, and Ohio. A potential report of an ABB in Michigan in 2017 is being investigated to determine if the area supports ABBs (Service 2019a, p. 7). Figure 3 shows the current range of the ABB. The Species Status Assessment Report defined populations as analysis areas based on broad geographic and ecological patterns to use in the evaluation of the species (Service 2019a, pp. 21-23).

Due to the severity of the decline and uncertainty regarding the causes, the recovery actions in the 1991 recovery plan focused on preventing the extinction of the species rather than developing actions and criteria for recovery. Recovery criteria were developed for downlisting, not for recovery. The objectives of the recovery program are: (1) Reduce the immediacy of the threat of extinction to the ABB and (2) improve its status so that it can be reclassified from endangered to threatened (Service 1991, p. 31). The Service's 2008 five year status review found that the ABB should remain as endangered because threats to the species had not been abated sufficiently to show that the ABB is no longer in danger of extinction (Service 2008, p. 35). The Service's 2019 proposed rule indicated that the threats to the species have been reduced to the point that it no longer meets the definition of an endangered species under the Act, but is likely to become endangered within the foreseeable future (84 FR 19013).



Figure 3. American Burying Beetle Species Status Assessment Analysis areas (Service 2019a, p. ES-2).

The populations in Nebraska/South Dakota, Kansas/Oklahoma, Oklahoma/Arkansas, and central Arkansas were all estimated to be greater than 1,000 individuals in 2005 with a total estimated rangewide population of approximately 50,000 individuals (Amaral et al. 2005, p. 37). However, populations of the ABB fluctuate annually due to the weather, carrion availability, and other factors; thus, these population estimates have little utility unless managers conduct consistent surveys over the course of several years so that we can evaluate trends (Service 2008, p. 14). Such rangewide surveys are not currently conducted for this species and we have limited information by which to measure ABB population abundance (Service 2019a, p. 71). Jurzenski et al. (2011, pp. 137-138) also noted that it is necessary to carefully interpret mark and recapture data due to the assumptions that emigration and immigration do not occur and that all individuals are available for recapture during the sampling timeframe. For the above reasons, the Service used the ratio of positive to negative ABB surveys to determine ABB relative abundance in the population analysis areas, rather than population estimates (Service 2019a, p. 71).

Threats

Habitat loss and alteration, availability of carrion, competition with meso-carnivores, inter and intra-specific competition, loss of genetic diversity, disease and pathogens, climate change, pesticides, and artificial lighting were identified as potential risk factors to the ABB (Service 2019a, pp. 25-49). Habitat fragmentation changes the species composition in ABB habitat, lowers the density of indigenous prey species, and results in increased competition for prey (mammals and birds) with vertebrate scavengers (Ratcliffe 1996, p 64; Amaral et al. 1997, p. 124; Bedick et al. 1999, p. 179). Adults and larvae depend on dead animals (carrion) for food, moisture, and reproduction. Although much of the evidence suggesting the reduction of carrion resources due to habitat change as a primary mechanism driving the decline of the ABB is circumstantial, this hypothesis fits the temporal and geographical pattern of the disappearance of ABBs; and, is sufficient to explain why ABBs declined while related species did not (Service 2019a, p. 174). Some remaining populations have risks associated with areas of urban development, but most current ABB populations are in rural areas and have potential risks associated with soil disturbance activities. Risks associated with the effects of changing climate, including increasing temperatures, are now a significant threat for some analysis areas (Service 2019a, p. 50).

Reproduction/Active Periods

The ABB is a nocturnal species (Service 1991, p 11) that lives for only one year (Bedick et al. 1999, p. 178). ABBs emerge from their winter inactive period when ambient nighttime air temperatures consistently exceed 59° F (15 °C) (Kozol 1988, p. 11; Kozol 1990, p. 4; Bedick et al.1999, p. 179; Service 2008, p. 13). Typically, ABBs are active from May through September in southern portions of their range, but in more northern latitudes of their range, the active period is June through August (Service 2019a, p. 10). ABBs are active at night during their active period; they are most active from two to four hours after sunset (Service 2019a, p. 10). During the daytime, ABBs are believed to bury under soil or vegétation litter (Jurzenski 2012, p. 76.)

Reproduction occurs in the spring to early summer. ABB's require vertebrate carcasses of sufficient size (80-200g) for breeding (Holloway and Schnell 1997, p. 145). The female lays eggs in the soil adjacent to the carcass where they incubate for about 6 days before becoming larvae (Service 2019a, p.18). New adult ABBs or offspring (called tenerals), usually emerge in summer, over-winter (hibernate) as adults, and comprise the breeding population the following summer (Kozol 1988, p 2; Amaral et al. 2005, pp. 30, 35).

Feeding

Individual ABBs must fly to find food, a mate, and an appropriate sized carcass on or near suitable soils for burial (Service 2019a, p. 11). When not involved with brood rearing, adults' food sources can include selection of an array of available carrion species and sizes, as well as feeding through capturing and consuming live insects (Service 1991, p. 11). In a lab, the ABB was attracted to both avian and mammalian carcasses (Kozol et al. 1988, p. 170), reptiles, amphibians, and fish (Bedick et al. 1999, p. 174).

Habitat

The ABB is considered a generalist in terms of the vegetation types where it is found, as it has been successfully live-trapped in a wide range of habitats, including wet meadows, partially forested loess canyons, oak-hickory forests, shrub land and grasslands, lightly grazed pasture, riparian zones, coniferous forest, and deciduous forests with open understory (Walker 1957, entire; Service 1991, pp.14-17; Service 2008, pp.8-11; Creighton et al. 1993, entire; Lomolino et al. 1995, entire; Lomolino & Creighton 1996, entire; Jurzenski 2012, pp.47-72; Willemssens 2015, pp. 5–6). Individuals do not appear to be limited by vegetation types as long as food, shelter, and moisture are available; ABBs have been recorded moving between and among these habitat types (Holloway and Schnell 1997, entire; Creighton and Schnell 1998, entire). Trapping success was higher at sites where small mammals were abundant (Holloway and Schnell 1997, p. 151). The Service believes that preserving large areas of suitable habitat is a conservation strategy that contributes to maintaining viable ABB populations (Service 2014, entire).

A more detailed life history account of the ABB is on our website: https://www.fws.gov/southwest/es/oklahoma/Documents/ABB/Listing/ABBSSA_Final_V1.0_Feb2 019.pdf

ENVIRONMENTAL BASELINE FOR THE ACTION AREA

"Environmental baseline refers to the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline" (50 C.F.R. §402.02). The environmental baseline below describes the condition of the ABB and its habitat in the action area to provide the context for analyzing the effects of the action now under consultation.

Status of the Species within the Action Area

The ABB occurs within South Dakota and Nebraska and has been described as occurring in two, or three distinct populations, within different literature sources. In Amaral (2005, p. 27), these populations are described as only two distinct populations; a southern population centered in Lincoln and Dawson Counties (referred to as the "Loess Hills"), and a northern population in north central part of the state centered in Rock, Loup, Blaine, and Brown Counties and extending north into South Dakota. The five-year status review also discusses these two discrete areas but uses "Sand Hills" to describe the geographically larger ABB population in north central Nebraska (Service 2008, p. 25). The SSA Report identifies three analysis areas in Nebraska: Loess Canyons, Sand Hills, and Niobrara River (Service 2019a, pp. 22-23). The Loess Canyons

is the same as the Loess Hills population described in the earlier reports. However, the larger northern population described in those earlier reports was separated into two areas with the Niobrara River serving as the boundary between the two: "Sand Hills" analysis area (Sandhills analysis area) and "Niobrara River" analysis area. Figure 4 and 5 below depict the estimated distribution of the ABB near the Project.



Figure 4. Predicted Distribution of American Burying Beetle near the Project, as Modeled by Leasure and Hoback (2017, entire) and presented in the BA (BLM 2019, p. 95)



Figure 5. Predicted Distribution of American Burying Beetle near the Project, as Modeled by Jenkins et al. (2018) and Presented in the BA (BLM 2019, p. 96)

The action area for the Project falls within the Sandhills and Niobrara analysis areas described in the SSA Report (Service 2019a, entire). Approximately 8,633,685 acres of potential ABB habitat occurs in the Sandhills analysis area, including favorable, conditional, and marginal land cover types (Service 2019a, p. 63). The Sandhills analysis area has the highest ratio of positive to negative surveys of all ABB analysis areas. Future land use changes are not expected to impact relative abundance of ABBs in the Sandhills analysis area (Service 2019a, p. 119). Panella (2013, p. 2) indicates that since 2005 the trend of the ABB population in Nebraska is "fluctuating with drought." Approximately 2,961,469 acres of potential ABB habitat occurs in the Niobrara analysis area (northcentral Nebraska and southcentral South Dakota), including favorable, conditional, and marginal land cover types (Service 2019a, p. 65). The Niobrara analysis area has the highest ratio and amount of total protected lands of all ABB analysis areas (Service 2019a, p. 71) and moderate ratios of positive to negative surveys (Service 2019a, p. 121). Future land use changes may have minor local impacts but are not expected to impact relative abundance of ABBs in the Niobrara analysis area (Service 2019a, p. 121). Amaral (2005, p. 75) used survey results to estimate a population of 10,000 ABBs within 1,000 square miles of potentially suitable habitat in what is considered here as the Sandhills and Niobrara analysis areas (north central Nebraska and extending into South Dakota). Beetle populations in the Niobrara analysis area have demonstrated fluctuations, but with good recoveries over the last decade (Service 2019a, p. 120).

South Dakota

The ABB is found in South Dakota in Tripp, Todd, Bennett, and Gregory counties in South Dakota; the Project does not enter Todd or Bennett counties. Beetles have been collected in the 1990s from Todd, Tripp, and Gregory counties (Backlund and Marrone 1997, p. 55). More recent data are only available from Tripp and Gregory counties. Surveys in 2005 revealed that ABBs are concentrated in Tripp County, where the population is estimated to be approximately 1,000 individuals in an area of approximately 54,363 acres (Backlund et al. 2008, p. 14). Modeling by Jenkins et al. (2018, p. 2) suggested that the ABB is most likely to occur in relatively undisturbed sites in the loess prairie ecoregion in southern Tripp County. Jenkins et al. (2018, p. 2) surveyed for this species in 2014, 2016, and 2018 in an attempt to define the northern and western limits of its current occupied range. The results of the surveys and subsequent modeling showed that the population in South Dakota continued to occupy central and southern Tripp County. To the east of Tripp County, expanding agriculture has rendered the region less suitable for the ABB. However, in 2019, surveys were conducted unrelated to the project in southwestern Gregory County. ABBs were captured at two sites more than 2 miles from the Project, but the other six valid trap sites did not capture ABB's; the data indicate that the population density in Gregory County may be less than in Tripp County (Hoback 2019, entire). Intensive sampling in and near a portion of the action area was conducted in 2019 in Tripp County. Sampling in 2019 occurred in June (BLM, Appendix W) and August (BLM, Appendix X) and indicated that the ABB continue to occur in relatively high densities.

The best habitat for the ABBs in South Dakota is similar to that for the northern Nebraska population and consists of wet meadows in sandy soils with scattered cottonwoods trees. The

habitat quality ratings from 2013 have been re-analyzed in 2018, or, for some, 2019, to reflect current conditions. A summary of the current habitat ratings is shown on page 102 of the BA and a description of the habitat rating criteria are found on page 100 (BLM 2019). The re-analysis revealed a substantial decrease in suitable habitat in the proposed pipeline corridor in South Dakota, mostly resulting from increased development of agriculture (e.g., center-pivot corn fields). Although in 2013, 25 miles of pipeline ROW were prime habitat, only four miles of pipeline ROW remained prime habitat in 2018/2019. New agricultural developments near the ROW have reduced the habitat ratings to fair or marginal. Neither the route in South Dakota nor the rating scale has changed.

Suitability ratings of ABB habitat crossed by the Project in South Dakota are provided in Table 3.2-9 and Figure 3.2-9 on p. 100, and p. 97 of the BA, respectively (BLM 2019). The Project pipeline in South Dakota would cross approximately four miles of prime habitat, 12 miles of good habitat, 10 miles of fair habitat, and five miles of marginal habitat. Beetles are unlikely to occur in marginal and considered absent in poor habitat.

Two proposed electric power lines to pump stations in South Dakota are within range of the ABB and connect to PS-20 and PS-21. The power line to PS-20 would lie in the northwest corner of Tripp County, mostly outside of the current range of this species. While recent surveys not associated with the Project (Jenkins et al. 2018, p. 2) captured ABBs in central Tripp County south of the town of Winner, no traps were set in the northwestern part of the county. Results of only four trap sites to the north and west of Winner have been reported, none of which captured ABBs (Backlund et al. 2008, p. 12). Therefore, the power line to PS-20 is assumed to overlap the occupied range of this species only to the south of U.S. Route 18. This power line would be approximately 20.5 miles long, but only approximately 2.7 miles would lie within the range of the species, within which the approximately 16.5 acres of ROW were rated as marginal habitat (BLM 2019, Appendix W, American Burying Beetle Sampling Report June 2019).

The ROW for the power line to PS-21 would overlap approximately 56 acres of prime, 47 acres of good, 17 acres of fair, and five acres of marginal habitat (BLM 2019, pp. 100-101). No portion of the line overlaps unsuitable ("poor") habitat or extends beyond an 18.6-mile buffer around all known capture locations since 2001 (USFWS 2019a); however, the northern portion of the line, as well as the proposed rebuild of WAPA's Gregory substation, would lie outside of the likely occupied range of this species based on habitat modeling (Figure 4 and 5, above) (SDNHP 2019; Leasure and Hoback 2017, entire; Jenkins et al. 2018, entire). WAPA's substation rebuild would occur within approximately 6 acres of marginal habitat, but outside the likely occupied range of the species.

Nebraska

In Nebraska, ABB's are known to occur in Blaine, Boone, Boyd, Brown, Cherry, Custer, Dawson, Frontier, Gasper, Holt, Keya Paha, Lincoln, Loup, Rock, Thomas, Valley, and Wheeler counties, and may occur elsewhere in Nebraska (Figure 3). The Nebraska National Heritage Program database (NNHP 2019) reports documented occurrences in Boyd, Holt, and Keya Paha counties along the Project route and historic records of ABB in Antelope County, which the Project also passes through. Most of the ABBs in Nebraska are concentrated in the Sand Hills ecoregion, which the Project avoids. The Sandhills SSA analysis area (Service 2019a, entire) is a broader species population area description and is different than the Sandhills geographic ecoregion which is associated with a specific landscape type, though they do overlap. In addition, recent sampling has failed to detect this species anywhere along the MAR or in Antelope County. Therefore, the Project overlaps the range of this species in Nebraska only within Keya Paha, Boyd, and Holt counties (Figure 4 and 5 above). Additional information on ABB sampling results conducted in 2012 and 2018, and 2019 in Nebraska can be found in the BA (BLM 2019, pp. 101-109). Recent sampling in 2018 and 2019 along the Project route did not detect ABB's in the southeastern portion of Holt County or Antelope County (BLM 2019, pp. 105-106). The ABB continues to occur at low densities along the proposed pipeline ROW in the remaining portions of Holt, Boyd, and Keya Paha Counties (BLM 2019, figure 3.2-12 and 3.2-13, pp. 107-108), with densities in Holt County remaining the highest within the ROW in Nebraska. While the Project route in these counties is within the Sandhills and Niobrara SSA analysis areas, it is outside the Sandhills ecoregion.

Suitability ratings of ABB habitat crossed by the Project in Nebraska are provided in Table 3.2-11 and Figure 3.2-9 on p. 109, and p. 97 of the BA, respectively (BLM 2019). The proposed pipeline route in Nebraska would affect about 26 miles of prime, 13 miles of good, one mile of fair, and 5 miles of marginal habitat. In total, about 46 miles of habitat occur along the proposed pipeline ROW in Nebraska. Unlike in South Dakota, expansion of intensive agriculture near the proposed pipeline has been much slower in Nebraska, because much of the land suitable for such uses had already been under intensive cultivation by 2012; therefore, habitat reevaluation was not necessary except in areas not previously rated (BLM 2019, Appendix W).

Of the necessary new electrical power lines and substation in Nebraska, only the one serving PS-22 would occur within the current occupied range of the ABB. Trapping efforts in 2012, 2018, and 2019 confirmed the presence of the ABB at the trap sites closest to PS-22. The power line that would serve PS-22 would cross approximately one mile of marginal habitat and 1.5 miles rated poor (Table 3.2-12, BLM 2019, p. 109). Although this ROW would likely be 100 feet wide legally, an existing public road and associated road ROW would lie within the power line ROW. The proposed switching station, which would be constructed, owned, and operated by the local power providers, is assumed to occupy approximately 3.5 acres, and would be situated in marginal habitat. The next closest pump station, PS-23, and its associated power line in Antelope County would be located in an area heavily developed for agriculture and outside of the occupied range of the ABB (Leasure and Hoback 2017, entire; Jenkins et al. 2018, entire).

Factors Affecting Species Environment within the Action Area

Eastern red cedar encroachment, drought, land development, light pollution, and scavengers have been identified as threats to the ABB in Nebraska (Panella 2013, p. 2). Beetles are negatively associated with, and likely decline in response to habitat loss and fragmentation and increases in row crop agriculture and cultivated croplands (Bishop et al. 2002, p. 468; Leasure and Hoback 2017, entire). Agricultural expansion in South Dakota (BLM 2019, p. 99), and previous intensive agricultural conversion and existing cultivation in Nebraska (BLM 2019, p. 105), have resulted in losses of native prairie rangeland where ABBs occur. Most of the potential conversion of ABB habitat to cropland requires irrigation in Nebraska and South Dakota. Increased irrigation or other uses of ground water are a risk if they exceed recharge rates and lower the water table. This could reduce habitat suitability by declining aquifer levels and decreasing soil moisture near the surface (Service 2019a, p. 64). Additionally, developed and converted land leads to declines in grassland nesting birds and rodents, which probably historically provided a large portion of the carrion available to the ABB. Species in this land type (developed agriculture) are often replaced by scavenging mammals and birds that compete with burying ABBs for carrion. Fire suppression in prairie habitats in Nebraska allows the encroachment of woody plant species, particularly the eastern red cedar, which is thought to degrade habitat for burying ABBs by limiting their ability to forage for carrion (Walker and Hoback 2007, p. 297). Urban expansion remains a risk and wind energy development has increased in recent years and may become a larger risk in the future (Service 2019a, p. 64). Other potential threats listed in the SSA (Service 2019a, p. 25) include inter and intra-specific competition, loss of genetic diversity, in isolated populations, disease/pathogens, DDT, and invasive species. Climate Change is also discussed and is described in greater detail below.

Climate Change

Climate has always limited the ABB range to some degree. Populations at the northern edge of the historic range were limited by cool night time temperatures and shorter growing seasons and could potentially expand north as climates warm. However, there are no current populations near the northern edges of the historic range and habitat limitations, rather than climate may prevent existing populations from moving north (Service 2019a, p. 44). Within the Great Plains, including Nebraska and South Dakota, the number of days with the hottest temperatures and the number of nights with the warmest temperatures are projected to increase dramatically for both lower emissions and higher emissions scenario (Shafer et al., 2014, pp. 442–445). Future precipitation is much more challenging to model and therefore projections of it have more uncertainty as compared to temperature (Service 2019a, p. 39).

Climate change could affect habitat suitability and potentially reduce or expand ABB use of portions of Nebraska and South Dakota. Increasing temperatures and dryer conditions potentially associated with climate change could cause reductions in the species' reproduction and numbers. Similarly, milder winters could disrupt hibernation cycles if freezing temperatures don't occur until later in the year or if temperatures consistently reach 55°F to 60°F earlier in the year. Portions of the Sandhills and Niobrara populations are near the northern and western edge of the known ABB range and changes in temperature and moisture could affect suitable habitat in future years (Service 2019a, p. 64). Beetles in the areas may have a longer time period for potential reproduction than ABBs in the southern portion of their range. Beetles in Nebraska and South Dakota could emerge from over wintering by late May or June and be ready to reproduce at that time. From June to August, ABBs could have suitable conditions for reproduction in northern areas and that timeframe could be nearly twice as long as the southern portion of the ABB range (Service 2019a, pp. 47–48).

Climate change also has the potential to affect habitat availability through changes in land uses (Service 2019a, p. 48). The National Climate Assessment was conducted by region with Nebraska being a part of the Great Plains Region, and within that report, Shafer et al. (2014, p. 446) noted that rising temperatures in the Great Plains may increase human competition for water. Increased temperatures in the Great Plains states could lead to earlier spring snowmelt, decreased snowmelt season duration, and decreased peak snowmelt flows (Bathke et al. 2014, p. 26). Increased temperatures would also result in decreased soil moisture due to increased evapotranspiration from vegetation that breaks dormancy earlier. Drought frequency and severity would increase in Nebraska due to increased temperatures and expected seasonal variability in precipitation (Bathke et al. 2014, p. 33). Increased temperatures could increase water demands and usage for irrigation and potentially lower groundwater levels in aquifers (Service 2019a, p. 48). Also, increased temperatures and longer droughts may increase the percentage of pastures that are heavily grazed or increase the demand for hay and encourage more cuttings (Service 2019a, p. 48).

Habitat conditions, population abundance, and distribution are all likely to be affected by climate change. The Service analyzed in its recent SSA impacts of climate change to populations in the northern plains, which includes the Sandhills and the Niobrara populations in Nebraska and South Dakota (Service 2019a, entire). Under moderate emissions levels, populations in all northern plains areas should be maintained through 2099, but some reductions in abundance and distribution are possible as temperatures approach the temperature threshold levels. Under high emissions level, potential extirpation is likely for all of the northern plains areas by 2070–2099 under the high emissions level (Service 2019a, p. 162).

EFFECTS OF THE ACTION

Effects of the action are all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 C.F.R. §402.17)

Effects of the action are a reasonable prediction of the likely response by individuals of a species to and the resulting biological effects from the environmental changes brought about by implementation of the chosen proposed action. The effects of the action to the species will occur through implementation of the Project over the period of the Project life (50 years). Effects as a result of the Project construction, operations, maintenance, and repair is likely to result in mortality or potential injury to eggs, larvae and pupae, subadults (tenerals) and adults.

<u>Crushing and desiccation of individuals</u>— The Project is likely to result in effects to ABBs through the loss of individuals, including eggs and larvae in brood-rearing chambers, due to mortality caused by crushing from construction equipment and vehicle traffic after exposure during excavation. Removal and physical alteration of vegetation and soil during excavation and grading would resulting in injury or mortality to ABBs. Emergency repairs and other

maintenance activities requiring ground disturbance will affect the ABB similar to construction activities.

Activities involving physically altering soils is likely to expose ABB adults, larvae, and eggs, which would result in desiccation, leading to injury or mortality. For the purposes of this analysis, it is assumed that any ABB occupying an area physically disturbed by the Project will suffer mortality via crushing from construction equipment or desiccation as a result of exposure. It is unlikely that ABB would use any temporarily disturbed areas after the initial disturbance. Therefore, ABB would not be at an elevated risk of crushing or desiccation from the repeated use of a temporarily disturbed area by construction equipment.

Vehicle use and the minor, infrequent vegetation maintenance during operation of the pipeline or power lines, without soil disturbance and excavation, is unlikely to crush or expose individuals, as these activities would occur while ABBs are buried, either during the day or during the ABB inactive season, when risk of impacts to ABBs from these activities is very low (Hoback 2016, p. 26).

Habitat disturbance/loss - Construction activities would also lead to effects on the species through effects on its habitat, namely temporary habitat loss, permanent alteration of suitable habitat to unsuitable habitat, and habitat fragmentation where the pipeline and power lines are not already co-located with other utilities. The ABB is also sensitive to soil moisture and dies when desiccated (Bedick et al. 2006, pp. 27-28). Beetles seek soils containing high moisture levels when they are inactive and soil moisture would be reduced across the ROW as the site is prepared by removing vegetation and topsoil, and grading. Equipment operations within the pipeline ROW would compact the substrate; however, as described above under conservation measures, sub-soil and soil would be de-compacted and vegetation cover would be re-established within both the temporary and permanent pipeline ROW. Native vegetation seed would generally be used, unless otherwise directed by the landowner, or as required by USACE conditions if within wetlands. As stated in the Project CMRP (BLM 2019, Appendix B), restoration and revegetation will return the disturbed areas to approximate pre-construction vegetation, use, and capability. This involves soil treatment, monitoring at least every three weeks, and repair by Keystone where unsuccessful seed germination or erosion has occurred, and topsoil replacement and contour restoration in wetlands. Wetland edges and adjacent upland areas would be stabilized by establishing permanent erosion control measures and revegetation, as applicable, during final cleanup. Breeding, feeding, and sheltering activities will be affected by any activities that occur in the active season. Prev and carrion availability are likely to be affected by the temporary and permanent loss of habitat since prey will move out of the disturbed areas and not return until those temporarily disturbed areas are restored, in approximately four years. Emergency repairs and other maintenance activities in ABB habitat would result in habitat disturbance and loss, similar to construction activities.

Construction of power lines would not permanently remove ABB habitat except where pole structures would be installed. For substations or switching stations, it is assumed that all areas within a proposed development site would no longer provide habitat for the ABB after construction begins.

<u>Fragmentation of habitat</u> - The majority of pipeline construction access routes will be temporary and will be restored to their previous habitat condition upon completion of construction. Meeting the success criteria for restoration may take up to four years following completion of construction activities. However, prior to the completion of this restoration, temporary access routes would result in the short-term fragmentation of ABB habitat. Emergency repairs and other maintenance activities in ABB habitat would result in habitat fragmentation, similar to construction activities. Vertebrate scavengers (i.e., American crows, skunks, raccoons) that compete for prey sources can use these temporary access routes as travel corridors into unfragmented grassland habitat (though less likely than corridors made through forested area), thus increasing competition for ABB until the disturbed areas are restored. However, once revegetated, temporary access routes will not present a permanent travel corridor for vertebrate scavengers into grassland habitats, thereby eliminating this potential form of competition.

Trees eliminated from the power line ROW might influence the quality of habitat for the ABB, however, it would not remove any suitable habitat or change current habitat ratings. Tree removal would increase habitat fragmentation and may create a corridor, thus increasing vertebrate scavenger competition as described above.

Degradation of habitat from lighting - Activities may occur in limited instances at night and will require some form of artificial lighting. The ABB, like many insects, is attracted to artificial lighting (Service 1991, p. 29). This attraction to lighted construction areas may disrupt normal ABB feeding behavior or increase the risk of predation by attracting individuals to areas unsuitable for ABB use. Beetles would be attracted to artificial lighting only during the active season of June through August (Service and NGPC 2008, entire). However, to minimize effects during the active season, most construction would take place during daylight hours and construction areas would generally not use artificial lighting. Activities that could potentially require lighting include critical pipeline tie-ins (connection of a pipeline to a facility, other pipeline systems or different sections of a pipeline), HDD crossings, and certain work required after sunset due to weather, safety, or other proposed-Project requirements. HDD crossings would require 24-hour operation until the crossing is completed. Where such activities require lighting, the lights will be down shielded. Lighting required for contractor yards and pump stations will also be down shielded, except where required for safety and security, and will utilize sodium vapor or warm, amber colored LED lighting (color temperature of 3000K or less and no greater than 70,000 lumens) to minimize effect to ABB. During Project operations, lights associated with aboveground facilities will only use on sodium vapor light or warm, amber colored LED lighting (color temperature of 3000K or less and no greater than 70,000 lumens) with downshield, as recommended by NGPC (NGPC 2019b, entire). We anticipate that these minimization measures will limit the likelihood of attracting ABB's to the active construction and operations areas, thereby reducing effects from lighting.

<u>Temporary disruption of behavior</u> - Increases in human activity, vehicle traffic, and noise as a result of Project activities are likely to cause ABBs to avoid areas occupied by construction personnel and equipment that may otherwise be present in suitable habitat. ABB avoidance of construction personnel and equipment is expected to be temporary.

Overwintering impacts - ABBs could be affected by the operating pipeline during the inactive season (October through early April). As previously discussed, active periods are correlated to night air temperatures. Oil transport through the pipeline releases heat that is dissipated through the soil to the ground surface. Geothermal models indicate the potential for the pipeline to warm surface areas by as much as 10°F in northern regions (South Dakota and Nebraska) (BLM 2019, Appendix E). It is unknown whether the ABB would be attracted, repelled, or neither, to soil that is artificially warmed. ABBs in Nebraska and South Dakota likely have a slowed metabolism during months where temperatures are below zero (BLM 2019, p. 116). It is unknown whether ABBs would suffer mortality from starvation if they were kept from freezing, but substantial decreases in length of time soil temperatures are below freezing would likely cause the ABBs to use too much fat energy during the winter months when they are underground. While they are underground, warming of the soil from the pipeline may also cue the ABBs to emerge prematurely (i.e., prior to late May or early June) when midnight air temperatures have not yet reached 60 °F. This may result in ABBs above ground without the ability to feed appropriately, or it may cause them to use more energy resources to rebury themselves in the soil, assuming temperatures permit such an activity. The existing literature suggests varying depths at which the ABBs overwinter (Service 2019a, p. 9), further complicating an evaluation of thermal effects. The Pipeline Temperature Effects Study conducted by Keystone in 2009 evaluated potential temperature changes at varying depths (i.e. 6, 12, 24 inches), and various distances from the pipeline (BLM 2019, Appendix E). The study predicted a reduction in the incidence of frozen soils at a depth of 12 inches and a distance of 11 feet from the pipeline centerline. The estimated total duration of unfrozen soils would likely be sufficient to affect ABBs overwintering within 11 feet from the pipeline centerline. While uncertainties were noted, temperature shifts above background levels substantial enough to influence habitat out to 11 feet from the pipeline (i.e., a 22-foot sub-corridor) were determined to make habitat unsuitable for ABB overwintering. Temperature related effects from pipeline operations to overwintering ABBs would be anticipated to occur annually once habitat restoration is complete (within four years) for the remaining duration of the Project life (46 years).

In summary, effects from the Project operations that modify soil temperature could increase overwintering mortality by (1) triggering early emergence when prey is not available and when cold temperatures could result in adult mortality; (2) causing higher metabolism for these insects resulting in starvation prior to emergence; or (3) causing mortality from the ABBs losing too much water because warmer temperatures result in greater desiccation risk to burying ABBs (Bedick et al. 2006, pp. 27-28).

Exposure to Potential Oil Spill - Under 50 C.F.R. §402.02, an effect or activity is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Under 50 C.F.R. §402.17(b), the conclusion of reasonably certain to occur must be based

on clear and substantial information. The determination of a consequence to be reasonably certain to occur must be based on solid information and should not be based on speculation or conjecture. This added term also does not mean the nature of the information must support that a consequence must be guaranteed to occur, but rather, that it must have a degree of certitude (50 C.F.R. §Part 402).

Potential oil spills could occur anywhere along the pipeline system. The timing, location, and magnitude of a potential oil spill along the pipeline is unknown, thereby increasing uncertainty of consequences to the ABB. While crude oil exposure has the potential to cause effects to individual ABBs, there is uncertainty related to the amount, location, and timing of effects to the ABB resulting from a crude oil spill from the pipeline. The uncertainty is due to the low probability of a spill and low probability of a spill coinciding with the presence of ABBs (BLM 2019, Appendix C). Despite the BA's determination that effects could be caused by oil spills, it is the Service's opinion that effects from an oil spill are not reasonably certain to occur.

If a Federal agency is involved in a response to an oil spill associated with the Project, the Federal agency may choose to initiate an emergency section 7 consultation with the Service on the Federal actions associated with the response (50 CFR 402.05). The Federal agency would submit information on the nature of the emergency action(s), the justification for the expedited consultation, and the impacts to endangered or threatened species and their habitats.

Species Response to the Proposed Action

Project effects on all life stages of individual ABBs will occur through disturbance, injury, or mortality during construction and operation. These effects can be estimated using an occurrence rate and the acres of suitable habitat affected (BLM 2019, Table 3.2-15, p. 115). The occurrence rate was estimated by BLM using the results of 2018 and 2019 surveys by Dr. Wyatt Hoback submitted to the Service in combination with a dataset from the Service showing all other ABB survey data within 1 mile of the Project. The number of ABBs affected is estimated by multiplying ABB habitat impacted (acres) by the estimated ABB density (ABBs per acre). This approach is consistent with other assumptions and abundance estimation methods in Nebraska, including the R line (Service 2019b, pp. 25-26). The estimate of individuals affected per acre is intended to be conservative, as it is based mostly on trapping results in high-quality habitats (prime and good), whereas impacts will occur across all habitat qualities. The estimate also factors in potential reproductive output, typically around 15 offspring per two adults (Service 2019a, p. 19). Using this approach, the estimated occurrence rates are 0.0899 ABBs per acre in South Dakota, 0.0046 ABBs per acre in Nebraska in Boyd County and Keya Paha County, and 0.0495 ABBs per acre in Nebraska in Holt County.

<u>Pipeline Construction</u> - The anticipated disturbance to the ABB habitat in South Dakota and Nebraska includes approximately 759.31 acres (314.22 in South Dakota + 445.09 in Nebraska) of temporary impacts and 485.8 acres (197.33 in South Dakota + 288.47 in Nebraska) of permanent impacts as a result of the proposed pipeline construction activities over the 50 year life of the ITP. In total (permanent and temporary) an estimated 733.56 (445.09+288.47) acres of habitat in Nebraska and 511.564 (314.223 + 197.33) acres in South Dakota (marginal, fair,

good, and prime) will be affected. In South Dakota and Nebraska, total habitat affected is 1,245.12 acres (Table 1 below in Summary of Effects). The Restoration Management Plan will ensure that the temporary impacts to habitat are restored to provide suitable habitat for the ABB and its carrion within four years post construction of the pipeline.

Based on the occurrence rates and the acres of suitable habitat that would be affected, total beetles affected by the proposed pipeline construction in Nebraska and South Dakota is estimated at 65 ABBs (see Table 1 below and BLM 2019, p. 115 for detailed calculations).

<u>Pipeline Operations - It is not known whether the ABB considers surface soil temperature when</u> selecting an overwintering site, although it is known that burying ABBs typically remain just below the frost line (Hoback and Conley 2014, pp. 22-24). However, assuming the ABB chooses an overwintering site without regard to soil temperature or other effects of the pipeline, approximately 83 acres of potentially suitable habitat in South Dakota, 65 acres of potentially suitable habitat in Nebraska in Boyd County and Keya Paha County, and 57 acres of potentially suitable habitat in Nebraska in Holt County would be affected during the ABB overwintering season during pipeline operation. Construction would remove suitable habitat for an estimated four years (construction followed by restoration), so approximately 46 seasons of ROW temperature increase from pipeline operation may impact overwintering ABBs. Using the same density estimates (ABBs per acre) as described above, and assuming that heat from the pipeline would affect any adult or teneral ABB that overwintered each inactive season within 11 feet of the pipeline, the total ABBs affected by heat produced from pipeline operations in Nebraska and South Dakota is estimated at 485 ABBs (see Table 1 below and BLM 2019, p. 118, for a detailed calculations).

Pipeline Repair and Maintenance - Emergency repairs and other maintenance activities are also anticipated to affect all life stages of the ABB, particularly when such activities involve excavation (BLM 2019, p.118). Emergency repairs may be completed at location and times that ABBs are active. This could lead to effects on individuals as described above for pipeline construction. Keystone estimates that less than 10 acres of suitable habitat would be affected by such activities. This is based on the following assumptions: (1) there will be 10 surveys over the 50 years to look for any locations needing maintenance, (2) history of similar pipeline operations indicates that there will be 0.05 location per mile per survey that would require some kind of maintenance. (3) each maintenance location will involve an area measuring approximately 110 feet wide by 50 feet long, totaling approximately 0.13 acre per location, and (4) all locations would occur in suitable habitat. Factoring these assumptions with the length of the proposed pipeline system within the range of the ABB leads to an estimate of somewhat less than 10 acres affected. Rounding up to 10 acres and apportioning these 10 acres across the counties according to the length of pipeline system within each county and factoring the affected area with the estimated number of individuals per acre, total beetles affected by emergency pipeline repair and maintenance in Nebraska and South Dakota combined is estimated at one ABB (see Table 1 below and BLM 2019, p. 119 for a breakdown of calculations).

<u>Potential Oil Spill -</u> As explained above, effects from oil spills are not reasonably certain to occur. Any injury to natural resources, including the ABB, associated with a release of oil or

hazardous substances or the response to a release of oil or hazardous substances is not exempted under this BO and therefore, an estimated number of ABBs affected by oil spills was not calculated.

<u>Power Infrastructure Construction and Operations-</u> New power infrastructure for three power lines, a substation rebuild, and a switching station coincide with potentially suitable ABB habitat. This power infrastructure would serve PS-20 and PS-21 in Tripp and Gregory counties, South Dakota, and PS-22 in Holt County, Nebraska. The remainder of the power infrastructure required for the Project would not overlap the current range of the species and will not affect ABBs. Construction of power infrastructure to these pump stations could affect the ABB. Power lines would not negatively affect the ABB except where pole structures would be installed. For substations or switching stations, this analysis assumes that all area within a proposed development site would no longer provide habitat for the ABB after construction begins.

Construction of the power line to PS-20 is reasonably certain to result in temporary disturbance, injury, or mortality of individual ABBs where the power line overlaps potentially suitable habitat within the range of this species. Considering that the ABB in Tripp County, South Dakota, only occurs south of U.S. Route 18, only a small portion of this 20.5-mile power line, approximately 2.7 miles, would lie within the range of this species. Within this 2.7 miles, an area of permanent disturbance covering three square feet per pole at 58 poles, a total of 0.004 acres of ABB habitat would be negatively impacted.

Construction of the 20.5-mile long power line to PS-21 is reasonably certain to result in the disturbance, injury, or mortality of individual ABBs where approximately 434 power poles are installed (approximately 0.03 acres). Additionally, rebuilding of WAPA's substation at the north end of this power line is reasonably certain to affect individuals through disturbance of six acres. While WAPA's conservation measure defined above would minimize effects from this substation rebuild, negative impacts from this activity are anticipated due to the permanent elimination of approximately six acres of marginal habitat.

Construction of the 2.5-mile long power line to PS-22 is reasonably certain to result in the disturbance, injury, or mortality of individual ABBs where approximately 54 power poles are installed (0.004 acres). Additionally, the 3.5-acre switching station is likely to affect individual ABBs, though the conservation measure of constructing this power infrastructure during the ABB's inactive period will minimize this. The permanent elimination of 3.5 acres of marginal habitat at the proposed switching station is likely to negatively impact the ABB as described for PS-21 above.

Power infrastructure activities occurring in the inactive season would impact adult and tenerals. Any power infrastructure activities required during the ABB active season would affect all life stages. In summary, power infrastructure will result in 9.54 acres of habitat disturbance in the form of permanent impacts resulting in adverse effects to one ABB (See Table 1 below and BLM 2019 Table 3.2-19, p. 121 for calculations).

Summary of Adverse Effects from All Activities

Overall, pipeline construction is estimated to affect approximately 65 ABBs, power line construction is estimated to affect approximately one ABB, heat impacts from pipeline operations are estimated to affect approximately 485 ABBs, and pipeline repairs are estimated to affect approximately one ABB. The Project is estimated to affect approximately 552 ABBs (Table 1).

Table 1- Estimated	American Burying	Beetle Habitat	Area Affected	l in South	Dakota (BLM
2019, p. 123-124)					

State (County)	Miles of ROW	Expected Area Affected (acres)	American Burying Beetles per Acre	American Burying Beetles Affected
Effects of Constructio	n			
		Pipeline Construct	ion	
South Dakota	31.0	511.56	0.0899	45.99
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	383.02	0.0046	1.76
Nebraska (Holt Co.)	21.5	350.54	0.0495	17.35
	65.10			
]	Power Infrastructure Con	nstruction	
South Dakota	23.2	6.04	0.0899	0.54
Nebraska (Boyd Co. and Keya Paha Co.)	0	0.00	0.0046	0.00
Nebraska (Holt Co.)	2.5	3.50	0.0495	0.17
<u>/ </u>	Ċ.		Subtotal	0.71
	65.81			
Effects of Operation		and a star when the	LA LANDER FROM	De transition de la contra
		Heat Effects		
South Dakota	31.0	3795.92 ª	0.0899	341.25
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	2994.60 ª	0.0046	13.78
Nebraska (Holt Co.)	21.5	2631.66 ª	0.0495	130.27
	485.30			
		Pipeline Repair	'S	
South Dakota	31.0	3.00 b	0.0899	0.27
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	3.00 ^b	0.0046	0.01
Nebraska (Holt Co.)	21.5	4.00 ^b	0.0495	0.20
			Subtotal	0.48
	485.78			
		OVERA	LL PROJECT TOTAL	551.59

^a Given that heat effects could recur in the same places every winter for the 46 years in the life of the Project that the pipeline is expected to operate in potentially suitable, recovered habitat, the number shown represents 46 times the area affected at any one time.

^b This area is the total expected to be affected during the life of the proposed Project.

<u>Conservation Measures and Mitigation</u> - As described in the DESCRIPTION OF THE PROPOSED ACTION of this BO, the Project proponents (Keystone, the electrical power providers, or WAPA) have committed to several conservation measures that will minimize

impacts to the ABB. Mowing and carrion removal prior to construction will make the habitat less attractive and is likely to reduce the amount of ABBs that will be present in the area prior to construction thus minimizing potential crushing of individuals. Most of the Project activities are planned to occur during daylight hours since ABBs are nocturnal, thus reducing disturbance to ABBs during the time of day when they are active. If Project activities will be conducted at night, lighting that minimizes effects to ABBs will be used to minimize disturbance while they are active. Conservation measures related to soil improvement, erosion and sediment control, and habitat restoration will ensure that the amount of habitat disturbance is minimized. Keystone has also committed to protect 1,034 acres of occupied ABB habitat (Keystone 2019, p. 116). Management and protection on large blocks of higher quality habitat/protected lands will contribute to the resiliency of the ABB population affected by this Project.

CUMULATIVE EFFECTS

Cumulative effects "...are those effects of future state, or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation" (50 C.F.R. §401.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA.

The Service knows of no projects reasonably certain to occur in the action area for which the Service has the level of detail necessary to identify and analyze the amount, location and type of specific effects. Any future projects built in potential ABB habitat would need to work with the Service to comply with the ESA.

Other future non-federal activities that may occur within the action area include non-federal pipelines, power infrastructure, residential and commercial development, state and county road projects creating new disturbed land or additional lighting, conversion of forested habitat to agricultural land, and the conversion of range lands or undeveloped lands to row crop agriculture (BLM 2019, p. 122). Based on historic land use changes in ABB habitat, the conversion of lands to row crop agriculture is likely to have the largest effect on the ABB. While future projects have the potential to impact ABB habitat, the intensity of impacts and whether or not it causes effects to ABB would depend on the number and type of projects built, presence or absence of ABB at the site, geographic location, and other site and project-specific characteristics. If ABB were exposed to impacts, the resulting effects would also depend on the number and types of avoidance, minimization, and mitigation measures that would be implemented for each project.

JEOPARDY DISCUSSION AND CONCLUSION

The Service has analyzed and described the likely adverse effects to the ABB from the Project. The purpose of our analysis was to assess the effects of this Project when combined with the status of the species, the environmental baseline, and any identified cumulative effects in order to form an opinion as to whether this action would be likely to jeopardize the continuing existence of the ABB. The regulatory definition of likely to jeopardize is "...to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both

the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species" (50 C.F.R. §402.02).

Reproduction - We anticipate that habitat disturbances from Project activities during the construction, emergency repairs, and maintenance would prevent ABB reproduction in the action area. Areas with permanent impacts would not be used for ABB reproduction for the life of the Project. For areas with temporary impacts, reproduction is not likely to resume until the disturbed habitat is successfully restored in four years. When construction begins, all ABBs present would be killed and therefore removed from the reproducing population. ABBs would not colonize the area until restored habitat is suitable. Therefore, no reproduction would occur for approximately four years in each area disturbed by construction. Once habitat is restored and prey re-inhabit the area, ABBs in nearby habitat would likely recolonize and begin reproducing. As habitat generalist in terms of vegetation types, if food, moisture, and shelter are present, ABBs should recolonize disturbed areas. Areas temporarily disturbed by construction activities will be used more than one time by Keystone for various activities throughout the construction process and will not be restored until construction is complete. We do not expect ABBs to inhabit the disturbed areas during construction due to the lack of habitat and prey species. Keystone will stabilize, revegetate, and restore temporarily disturbed areas within four years after construction and monitor to ensure successful restoration. The ABB and other disturbed wildlife species, including prey species, are likely to return to the area following construction when personnel and equipment are no longer present and suitable habitat has been restored (within four years of initial disturbance). ABBs returning to the area are expected to resume reproduction within successfully restored habitat. In addition, Keystone has committed to protect and manage a large block, approximately 1,034 acres, of occupied ABB habitat in perpetuity (Keystone 2019, p. 116). This will provide reproductive habitat for the ABB population.

Numbers - We estimate that 552 ABBs (one-time take of 66 ABB from construction, annual take of less than 11 ABBs/year for 46-years of operation and maintenance) will be disturbed, injured or killed as part of the Project during the anticipated 50-year Project lifetime (Table 1, above). ABB population estimates are available for the Sandhills and Niobrara analysis areas (combined into one population estimate) in which the Project passes through. As described above, Amaral et al. (2005, p. 75) did not distinguish or split the two populations and estimated the combined population to be about 10,000 ABBs. Population estimates are not available for the individual analysis areas (Sandhills and Niobrara). The population viability analysis by Amaral et al. (2005, p. 40) concluded that ABB populations of 1,000 or more individuals are viable long-term in the absence of severe catastrophic events or reduction in carrying capacity through a reduction in carcass availability, habitat loss, or fragmentation. Amaral et al. (2005, p. 38) indicates that populations of greater than 10,000 ABB can persist even through catastrophic events. Recently, the Sandhills population was estimated to be 55,743 (NPPD 2018, p. 113). The Service used the ratio of positive to negative ABB surveys to determine ABB relative abundance in population analysis areas (Service 2019a, p. 71). The ratio of positive to negative ABB surveys in the Sandhills analysis area was defined as the highest condition category of "good," with the highest ratio of positive to negative surveys compared to other analysis areas (Service 2019a, p. 95). The Niobrara unit had the second highest proportion of positive to negative surveys (Service

2019a, p. 72). The Project will not impact the long-term persistence of the Sandhills or Niobrara ABB populations because the 552 individuals (one-time take of 66 ABB from construction, annual take of less than 11 ABBs/year for 46-years of operation and maintenance) we expect the Project to take in the form of harm within the permit area represent only a small percentage of the estimated Sandhills and Niobrara populations; this level of population loss does not represent a catastrophic event. With little to no impact on the Sandhills and Niobrara population, we do not expect there would be any effect on the rangewide population estimated by Amaral (2005, p. 37) to be approximately 50,000 individuals. In addition, Keystone has committed to protect and manage a large block, approximately 1,034 acres, of occupied ABB habitat in perpetuity (Keystone 2019, p. 116). This will contribute to the resiliency of the ABB population.

Distribution – The majority of the impacts to the beetle and its habitat will be temporary, but permanent loss of habitat will also occur. Combined, the impacts to approximately 1,265 acres (excluding habitat rated as "poor") for the entire Project represents approximately 0.011 percent of the estimated Sandhills and Niobrara occupied range (combined 11,595,154 acres of potential habitat in the Sandhills and Niobrara areas). As discussed above, the temporarily impacted habitat would not be occupied by ABBs until the habitat is successfully restored within four years after construction. Once restored habitat reaches suitability criteria, ABBs and their carrion species from nearby areas are likely to recolonize. Thus, distribution would change slightly due to this temporary disturbance until recolonization occurs; these aspects of the range would not be permanently affected. However, ABBs would not recolonize the permanently lost habitat areas. But, those acres are scattered throughout the Project area and, even in totality, represent an even smaller fraction of the occupied range of the ABB in the Sandhills and Niobrara populations. Therefore, we do not anticipate any meaningful impacts to the ABB's range wide distribution.

Jeopardy Conclusion

The definition of "likely to jeopardize" hinges on a change to the reproduction, abundance and distribution of a species such that it appreciably reduces the likelihood of both survival and recovery. Therefore, the impacts of the Proposed Action were analyzed to determine the probable effects on reproduction, abundance, and distribution of ABB in the Action Area. The described changes to the ABB's reproduction, abundance, or distribution would have a negative effect on the ABB and its habitat due to the loss of 552 ABBs (one-time take of 66 ABB from construction, annual take of less than 11 ABBs/year for 46-years of operation and maintenance) and impacts to 1,265 acres of habitat (approximately 0.011 percent of the estimated Sandhills and Niobrara occupied range). However, based on the information presented above, we do not anticipate meaningful impacts to ABB reproduction, numbers, or range wide distribution. Additionally, given the impacts on ABB reproduction, numbers, and range wide distribution, the Project will not meaningfully preclude the likelihood of species recovery. The conservation measures, including the restoration of the temporary impact acres to suitable habitat and the protection in perpetuity and long term management of a large block of occupied beetle habitat, approximately 1,034 acres, will minimize the impacts of the Project and support recovery of the ABB. Therefore, this Project is not likely to reduce appreciably the likelihood of both the survival and recovery of this listed species in the wild. It is the Service's Biological Opinion that the Project is not likely to jeopardize the continued existence of the ABB.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is defined by regulation as "an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering" (50 C.F.R. $\S17.3$). Harass is defined by regulation as "... an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding or sheltering" (50 C.F.R. $\S17.3$). Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant" (50 C.F.R. $\S402.02$). Under the terms of section 7(b)(4) and section 7(o)(2), such taking is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this incidental take statement (ITS).

The ITS serves to enumerate or identify the amount or extent of take "caused by" all the effects of the action and exempts the action agencies from the prohibitions against that take under section 9 of the ESA. Here, take of ABB would not occur "but for" the proposed Federal actions. Given the scope of the effects of the Federal actions, it follows that the majority of the take exempted for the Federal agencies is occurring on lands that are outside the jurisdiction of the Federal agencies, or is related to activities undertaken by the applicant not under the authority of a Federal agency, with exception of the rebuilding of the WAPA substation within ABB habitat and RUS financing of power infrastructure. Therefore, this ITS does not extend the Federal agencies' take exemption to Keystone for the take caused by the Project's actions. Instead, Keystone is developing a HCP to support its application to the Service for a section 10(a)(1)(B) incidental take permit for the ABB for their activities on non-federal lands.

For the exemption in ESA section 7(o)(2) to apply to the Federal actions considered in this BO, Federal agencies must undertake the commitments to species' conservation measures under their jurisdiction that are described in the BA and BO, particularly in: 1) the DESCRIPTION OF PROPOSED ACTION section of this BO⁶, and 2) the Species Conservation Measures in the EFFECT EVALUATION section of the BA (BLM 2019, pp. 30-164). These species' conservation measure commitments are non-discretionary measures and must become binding conditions of any permit, contract, or grant issued for implementing the action. Consistent with ESA section 7(b)(4)(C)(iv), the Federal agencies have a continuing duty to regulate the action components covered by this ITS that are under its jurisdiction. The protective coverage of §7(o)(2) may lapse if the Federal agencies fails to:

⁶ Some conservation measures for the ABB were updated since the submission of the BA (BLM 2019), based on review and discussion with Federal agencies. Therefore, the Service is relying on the conservation measures for the ABB in this BO rather than the ABB conservation measures in the BA.

- assume and implement the non-discretionary species' conservation measures applicable to the Federal agency; or
- require a permittee, contractor, or grantee to adhere to the non-discretionary species' conservation measures applicable to the Federal agency through enforceable terms that are added to the permit, contract, or grant document.

The Service believes all species' conservation measures necessary and appropriate to minimize take of ABB have been incorporated into the proposed action (See the DESCRIPTION OF PROPOSED ACTION section of this BO and Species Conservation Measures in the EFFECT EVALUATION section of the BA (BLM 2019, pp. 30-164)). The Service has given appropriate consideration to the beneficial actions proposed by the Federal agencies and Keystone (50 C.F.R. §402.14(g)(8)). Therefore, no terms and conditions or reasonable and prudent measures are necessary for Federal agencies for this ITS (see REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS sections below).

In order to monitor the impact of incidental take, the Federal agencies must report, within their jurisdiction, the progress of the action and its impact on the species to the Service as specified in this ITS.

AMOUNT OR EXTENT OF TAKE ANTICIPATED

Estimating take of insects such as the ABB is challenging because ABB numbers fluctuate substantially. The take calculation is based on the density of ABBs at the time that surveys were conducted. The Service knows of no approach that provides a better means of estimating ABB numbers and densities in the action area. The Service anticipates that the Project is reasonably certain to cause incidental take of individual ABB in the form of harm. Harm will result from death or injury of ABB from construction of the pipeline and power infrastructure, emergency repairs and maintenance of the pipeline, and pipeline operations. The methodology for calculating take is further described in the <u>Species Response to the Proposed Action</u> section in this BO.

Activities associated with pipeline construction are anticipated to result in an estimated one-time take of 65 ABBs. Activities associated with power infrastructure construction will account for an estimated one-time take of one ABB. Activities associated with emergency repairs and maintenance of the pipeline will account for an estimated take of one ABB. Activities associated with pipeline operations specific to heat related impacts will account for an estimated take of 485 ABBs. The combined total take of 486 ABBs from heat related impacts and pipeline emergency repairs and maintenance will occur over the 46-year life of the Project after restoration. Averaged annually, these activities would result in take of less than approximately 11 ABBs per year. No take is authorized for oil spills. In total, the Project (pipeline construction, operations, emergency repairs, and power infrastructure) is anticipated to result in incidental take of 552 ABBs in South Dakota and Nebraska over the 50-year duration of the Project.

EFFECT OF THE TAKE

In this BO, the Service determines that this level of anticipated take is not likely to result in jeopardy to the ABB.

REASONABLE AND PRUDENT MEASURES

The Service believes that all conservation measures necessary and appropriate to minimize take of ABB have been incorporated into the proposed action (See DESCRIPTION OF PROPOSED ACTION). The Service has given appropriate consideration to the beneficial actions proposed by the Federal agencies and Keystone (50 C.F.R. 402.14(g)(8)). Therefore, no RPMs are necessary for this ITS.

TERMS AND CONDITIONS

No reasonable and prudent measures to minimize the impacts of incidental take caused by the action are provided in this ITS; therefore, no terms and conditions for carrying out such measures are necessary.

MONITORING AND REPORTING REQUIREMENTS

In order to monitor the impacts of incidental take, the Federal agencies must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement (50 C.F.R. §402.14(i)(3)). This section provides the specific instructions for such monitoring and reporting (M&R). As necessary and appropriate to fulfill this responsibility to monitor and report the progress of the action and its impact on the species, the Federal agencies must require any permittee, contractor, or grantee to accomplish the monitoring and reporting requirements that apply to action components under its jurisdiction through terms that are added to the permit, contract, or grant document. Such terms must include a requirement to immediately notify the Federal Agencies and the Service if the amount or extent of incidental take specified in this ITS is exceeded during action implementation or if the action and its impact on the listed species has changed.

<u>M&R #1.</u> <u>Annual Report</u>. The Federal agencies are responsible for ensuring that the Project activities under their jurisdiction are implemented as described in the Project description. Upon initiation of activities, each Federal agency will provide the Service with an annual report that describes all activities that were covered under the biological opinion under each Federal agency's respective jurisdiction. The report will include a summary of completed construction activities and the conservation measures that were implemented for that year. Annual reporting for each agency will continue until activities under their jurisdiction have been completed

Procedures for Handling and Disposing of American Burying Beetles

If a dead or impaired ABB is found, care should be taken in its handling to preserve biological materials in the best possible state for later analysis of cause of death. In conjunction with the care of injured endangered or threatened species or preservation of biological materials from a dead animal, the finder has the responsibility to ensure that evidence associated with the specimen is not unnecessarily disturbed. The dead or impaired ABB should be photographed prior to disturbing it or the site. The Service is to be notified within three (3) calendar days upon locating a dead or injured ABB. Initial notification must be made to the applicable Service

Office of Law Enforcement for Nebraska at (316) 788-4474. Then the Nebraska Ecological Services Field Office at (308) 382-6468. Notification must include the date, time, precise location of the injured animal or carcass, and any other pertinent information. Formal written notification also must be submitted within seven (7) calendar days.

All dead or moribund adults should be salvaged by placing them on cotton in a small cardboard box as soon as possible after collection. The date and location of collection should be included with the container. Specimens should then be furnished to the repository identified by the appropriate Ecological Services Field Office for deposition in their collection of invertebrates, or to another suitable site approved by the Service.

REINITIATION NOTICE

This concludes consultation on the actions outlined in the request. As provided in 50 C.F.R. §402.16:

(a) Reinitiation of consultation is required and shall be requested by the Federal agency or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

(1) If the amount or extent of taking specified in the incidental take statement is exceeded;

(2) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

(3) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or

(4) If a new species is listed or critical habitat designated that may be affected by the identified action.

(b) An agency shall not be required to reinitiate consultation after the approval of a land management plan prepared pursuant to 43 U.S.C. 1712 or 16 U.S.C. 1604 upon listing of a new species or designation of new critical habitat if the land management plan has been adopted by the agency as of the date of listing or designation, provided that any authorized actions that may affect the newly listed species or designated critical habitat will be addressed through a separate action-specific consultation. This exception to reinitiation of consultation shall not apply to those land management plans prepared pursuant to 16 U.S.C. 1604 if:

(1) Fifteen years have passed since the date the agency adopted the land management plan prepared pursuant to 16 U.S.C. 1604; and

(2) Five years have passed since the enactment of Public Law 115-141 [March 23, 2018] or the date of the listing of a species or the designation of critical habitat, whichever is later

LITERATURE CITED

- Amaral M., Morgan R, Davidson C, Dikeman H, Holzer K, Byers O (eds.). 2005. American burying beetle (*Nicrophorus americanus*) population and habitat viability assessment: Final Report. IUCN/SSC Conservation Breeding Specialist Group, Apple Valley, MN. 80 pp.
- Amaral M, Kozol AJ, French T. 1997. Conservation strategy and reintroduction of the endangered American burying beetle. Northeastern Naturalist 4(3):121–132.
- Backlund, D.C., G.M. Marrone, C.K. Williams, and K. Tilmon. 2008. Population Estimate of the Endangered American Burying Beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) in South Dakota. *The Coleopterists Bulletin* 62: 9-15.
- Backlund, D.C., and G.M. Marrone. 1997. "New Records of the Endangered American Burying Beetle, *Nicrophorus americanus* Olivier, (Coleoptera: Silphidae) in South Dakota." *The Coleopterists Bulletin* 51: 53-58.
- Bathke DJ, Oglesby RJ, Rowe CM, Wilhite DA. 2014. Understanding and Assessing Climate Change: Implications for Nebraska. University of Nebraska-Lincoln, Lincoln, NE.
- Bedick, J.C., W.W. Hoback, and M.C. Albrecht. 2006. High Water-loss Rates and Rapid Dehydration in the Burying Beetle, *Nicrophorus marginatus*. *Physiological Entomology* 31: 23-29.
- Bedick, JC, Ratcliffe BC, Hoback WW, Higley LG. 1999. Distribution, ecology and population dynamics of the American burying beetle *Nicrophorus americanus* Olivier (Coleoptera, Silphidae) in South-central Nebraska, USA. Journal of Insect Conservation 3(3): 171–181.
- Bishop, A.A., W.W. Hoback, M. Albrecht, and K.M. Skinner. 2002. GIS Reveals Niche Partitioning by Soil Texture among Carrion Beetles. *Transactions in GIS* 6: 457-470.
- Creighton JC, Schnell G. 1998. Short-term movement patterns of the endangered American burying beetle *Nicrophorus americanus*. Biological Conservation 86: 281–287.
- Creighton JC, Vaughn CC, Chapman BR. 1993. Habitat preference of the endangered American burying beetle (*Nicrophorus americanus*) in Oklahoma. The Southwestern Naturalist 38:275–277.
- Hoback, W. 2019. Email Communication from Dr. Wyatt Hoback of Hoback Consulting to Valerie Haragan and Jon Schmidt of EXP Energy Services. November 22, 2019.
- Hoback, W. 2016. *Effects of Compaction and Soil Moisture on American Burying Beetles*. Nebraska Department of Roads and the Federal Highway Administration. Report No. SPR-P1(15) M049.
- Hoback, W., and A. Conley. 2014. Overwintering Biology and Tests of Trap and Relocate As a Conservation Measure for Burying Beetles. Nebraska Department of Transportation Research Reports. 175.
- Holloway AK, Schnell GD. 1997. Relationship between numbers of the endangered American burying beetle *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) and available food resources. Biological Conservation. 81:145-152.
- Jenkins, T., W.W. Hoback, D. Leasure, P. Mulder, and C. Davis. 2018. Distribution of the Endangered American Burying Beetle at the Northwestern Limit of its Range. *Insect Systematics and Diversity* 2, no. 1: 1–8. doi: 10.1093/isd/ixx011
- Jurzenski J. 2012. Factors affecting the distribution and survival of endangered American burying beetles, *Nicrophorus americanus* Olivier. Dissertations and Student Research in Entomology. University of Nebraska Kearney. Kearney, NE.
- Jurzenski J, Snethen DG, Brust ML, Hoback WW. 2011. New records of carrion beetles in Nebraska reveal increased presence of the American burying beetle, *Nicrophorus americanus* Olivier

(Coleoptera: Silphidae) Great Plains Research: A Journal of Natural and Social Sciences. 1188. https://digitalcommons.unl.edu/greatplainsresearch/1188

Keystone, see TransCanada Keystone Pipeline, L.P.

- Kozol AJ. 1990. The natural history and reproductive strategies of the American burying beetle, *Nicrophorus americanus*. Unpublished report prepared for the U.S. Fish and Wildlife Service. 15pp.
- Kozol AJ, Scott MP, Traniello, JA. 1988. The American burying beetle: studies on the natural history of an endangered species. Psyche 95: 167-176.
- Leasure, D.R. and W.W. Hoback. 2017. "Distribution and Habitat of Endangered American Burying Beetle in Northern and Southern Regions." *Journal of Insect Conservation* 21:75–86. doi: 10.1007/s10841-017-9955-5.
- Lomolino MV, Creighton JC. 1996. Habitat selection, breeding success and conservation of the endangered American burying beetle, *Nicrophorus americanus*. Biological Conservation 77:235–241.
- Lomolino MV, Creighton JC, Schnell GD, Certain DL. 1995. Ecology and conservation of the endangered American burying beetle, *Nicrophorus americanus*. Conservation Biology 9:605–614.
- Nebraska Game and Parks Commission (NGPC). 2019a. American Burying Beetle Conservation Measures Protocol: Mowing and Carrion Removal. May 31, 2019 draft.
- Nebraska Game and Parks Commission (NGPC). 2019b. Email from Melissa Marinovich, Assistant Division Administrator, NGPC. October 25, 2019.
- Nebraska Game and Parks Commission (NGPC). 2018. Estimated current range of American burying beetle (*Nicrophorus americanus*). Available at:

http://outdoornebraska.gov/americanburyingbeetle/. Accessed December 17, 2018.

- Nebraska Natural Heritage Program (NNHP). 2019. Conservation and Environmental Review Tool (CERT) Project Report and GIS files.
- Nebraska Public Power District (NPPD). 2018. R-Project Final Habitat Conservation Plan. Prepared for Nebraska Public Power District, Norfolk, NE. Prepared by POWER Engineers. December 5, 2018. Available at: <u>https://www.fws.gov/mountain-prairie/es/nebraska/library/R-Project-Final-HCP.pdf</u>.
- Panella MJ. 2013. American burying beetle (Nicrophorus americanus). A species conservation assessment for the Nebraska Natural Legacy Project. Nebraska Game and Parks Commission, Wildlife Division.
- Ratcliffe BC. 1996. The carrion beetles (Coleoptera: Silphidae) of Nebraska. Bulletin of the Nebraska State Museum Vol. 13. 100pp.
- Shafer M, Ojima D, Antle JM, Kluck D, McPherson RA, Petersen S, Scanlon B, Sherman K. 2014. Ch. 19: Great Plains. Climate Change Impacts in the United States: The Third National Climate Assessment, Melillo JM, Richmond TC, Yohe, Eds., U.S. Global Change Research Program, pp. 441-461. doi:10.7930/J0D798BC.
- South Dakota Natural Heritage Program (SDNHP). 2019. Element Occurrence GIS Shapefile. January 8, 2019.
- TransCanada Keystone Pipeline, LP. 2019. Draft Habitat Conservation Plan. Submitted by EXP Energy Services, Inc., on November 25, 2019.
- United States Bureau of Land Management . 2019. Amended Biological Assessment for the Keystone XL Project. November 26, 2019. Received by the Service on November 27, 2019.

- United States Department of State (Department). 2018. Draft Supplemental Environmental Impact Statement Keystone XL Mainline Alternative Route. September 2018. Available at: https://keystonepipeline-xl.state.gov/documents/organization/286279.pdf.
- United States Department of State (Department). 2014. *Final Supplemental Environmental Impact Statement for the Keystone XL Project*. January 2014. Available at: <u>https://2012-keystonepipeline-xl.state.gov/finalseis/index.htm</u>
- United States Department of State (Department). 2012. *Final Biological Assessment for the Keystone XL Project.* Volume I. December 21, 2012. Copies available within Department (2014).
- United States Fish and Wildlife Service (Service). 2019a. Species Status Assessment Report for the American Burying Beetle (*Nicrophorus americanus*). Version 1.0. February 2019. Available at: <u>https://www.fws.gov/southwest/es/oklahoma/Documents/ABB/Listing/ABBSSA_Final_V1.0_Feb2019.pdf</u>
- United States Fish and Wildlife Service (Service). 2019b. Biological Opinion Proposed Issuance of an Incidental Take Permit for the Federally Endangered American Burying Beetle *Nicrophorus americanus*. Nebraska Public Power District R-Project Transmission Line. TAILS No. 06E00000-2019-F-0001. June 4, 2019. Accessed September 19, 2019. Retrieved from: <u>https://www.fws.gov/nebraskaes/Library/Signed_RProject_BiologicalOpinion_06042019.pdf</u>
- United States Fish and Wildlife Service (Service) 2016. Programmatic Biological Opinion on the "Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions, January 5, 2016. Available at: <u>https://www.fws.gov/midwest/endangered/section7/batbo/16_NLEBRange_Final4d01052016.pd</u> f.
- United States Fish and Wildlife Service (Service). 2014. American Burying Beetle conservation strategy for the establishment, management, and operations of mitigation lands. Available at: <u>https://www.fws.gov/southwest/es/oklahoma/documents/abb/surveying%20final/final%20abb%2</u> <u>Oconservation%20strategy%20and%20mitigation%20guidance%202014_05_21.pdf</u>.
- United States Fish and Wildlife Service (Service). 2013. Biological Opinion on the Effects to Threatened and Endangered Species from the Issuance of a Presidential Permit to TransCanada Keystone XL Pipeline (Keystone) by the U.S. Department of State for the Proposed Construction, Operation, and Maintenance of the Keystone XL Pipeline and Associated Facilities at the Border and Interrelated and Interdependent Actions. May 15, 2013. FWS-NE: 2013-164. Available at: https://2012-keystonepipeline-xl.state.gov/documents/organization/209745.pdf.
- United States Fish and Wildlife Service (Service). 2008. Five-year review of the status of the American Burying Beetle. June 16, 2008. Southwest Regional Office, Albuquerque, New Mexico. Available at: https://ecos.fws.gov/docs/five_year_review/doc1968.pdf.
- United States Fish and Wildlife Service (Service). 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp. Available at: https://ecos.fws.gov/docs/recovery_plan/910927.pdf.
- United States Fish and Wildlife Service (Service). 1989. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle, Final Rule, Federal Register Vol.54 No.133, 29652-29655. Available at: <u>https://ecos.fws.gov/docs/federal_register/fr1559.pdf</u>.
- United States Fish and Wildlife Service (Service) and Nebraska Game and Parks Commission (NGPC). 2008. Conservation Measures for the American Burying Beetle. Service, Nebraska Ecological Services Field Office. Kearney, NE. pp.7.

- Walker, T. J. 1957. Ecological studies of the arthropods associated with certain decaying materials in four habitats. Ecology 38(2): 262–276.
- Walker Jr. TL, Hoback WW. 2007. Effects of invasive eastern red cedar on capture rates of *Nicrophorus americanus* and other Silphidae. Environmental Entomology 36:297–307.
- Willemssens, K.A. 2015. Soil preferences of Nicrophorus beetles and effects of compaction on burying behavior. University of Nebraska-Lincoln. Dissertations & Theses in Natural Resources. Paper 112. <u>http://digitalcommons.unl.edu/natresdiss/112</u>.
- Wilson, D.S., and J. Fudge. 1984. "Burying Beetles: Intraspecific Interactions and Reproductive Success in the Field." Ecological Entomology 9: 195-203.

Biological Assessment

for the

Keystone XL Project



November 26, 2019
TABLE OF CONTENTS

1.	Intro	oduction	1
	1.1.	Section 7 ESA Process	1
	1.2.	Section 10 ESA: Habitat Conservation Plan	1
	1.3.	Consultation History	1
	1.4.	Analysis Summary	8
2.	Prop	oosed Federal Decisions and the Proposed Project	12
	2.1.	BLM	12
	2.2.	WAPA	14
	2.3.	RUS	14
	2.4.	USACE	15
	2.5.	Summary of Proposed Federal Decisions	15
	2.6.	Summary of the Proposed Project	16
		2.6.1. Project Overview	16
		2.6.2. Land Requirements	21
		2.6.3. Electrical Transmission and Distribution Lines and Substations	23
		2.6.4. Pipeline Incident Analysis	23
3.	Effe	ct Evaluation	26
	3.1.	Cumulative Effects Assessment Methodology	
	3.2.	Effects on Federally Endangered Species	27
		3.2.1. Black-footed Ferret—Endangered/Experimental Populations	27
		3.2.2. Interior Least Tern—Endangered	
		3.2.3. Whooping Crane—Endangered	51
		3.2.4. Pallid Sturgeon—Endangered	76
		3.2.5. Topeka Shiner—Endangered	85
		3.2.6. American Burying Beetle—Endangered	91
	3.3.	Effects on Federally Threatened Species	124
		3.3.1. Northern Long-Eared Bat—Threatened	124
		3.3.2. Piping Plover—Threatened	132
		3.3.3. Rufa Red Knot—Threatened	150
		3.3.4. Western Prairie Fringed Orchid—Threatened	157
	3.4.	Summary of Effects on Federally Listed Species and Their Habitats	167
		3.4.1. Summary of Effects on Habitat	167
		3.4.2. Summary of Effects on Individuals	169
		3.4.3. Summary of Analysis Findings	170
4.	Refe	rences	171

LIST OF APPENDICES

- Appendix A Letters of Section 7 Consultation and Supporting Communications
- Appendix B Construction, Mitigation, and Reclamation Plan
- Appendix C Proposed Project Description
- Appendix D Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan
- Appendix E Pipeline Temperature Effects Study
- Appendix F CONFIDENTIAL—NOT USG CLASSIFIED Habitat Mapping along Transmission Lines
- Appendix G CONFIDENTIAL—NOT USG CLASSIFIED Interior Least Tern and Piping Plover 2013 Survey
- Appendix H CONFIDENTIAL—NOT USG CLASSIFIED Special-Status Fish 2013 Survey
- Appendix I CONFIDENTIAL—NOT USG CLASSIFIED Union Creek Topeka Shiner Survey Report
- Appendix J CONFIDENTIAL—NOT USG CLASSIFIED 2012 Results of Survey for American Burying Beetle, *Nicrophorus americanus*, in Northern Keya Paha, Western Boyd, Eastern Holt and Antelope Counties
- Appendix K CONFIDENTIAL—NOT USG CLASSIFIED 2013 Evaluation of Auxiliary Sites in Tripp County, South Dakota, for American Burying Beetle Habitat
- Appendix L CONFIDENTIAL—NOT USG CLASSIFIED American Burying Beetle Survey Report Nebraska Mainline Alternative Route
- Appendix M CONFIDENTIAL—NOT USG CLASSIFIED American Burying Beetle Sampling Report August 2018
- Appendix N CONFIDENTIAL—NOT USG CLASSIFIED 2013 Bat Survey Report
- Appendix O CONFIDENTIAL—NOT USG CLASSIFIED 2014 Northern Long-Eared Bat and Red Knot Habitat Assessment
- Appendix P CONFIDENTIAL—NOT USG CLASSIFIED Northern Long-Eared Bat Habitat Survey Nebraska Mainline Alternative Route
- Appendix Q CONFIDENTIAL—NOT USG CLASSIFIED 2013 Western Prairie Fringed Orchid Habitat Survey
- Appendix R CONFIDENTIAL—NOT USG CLASSIFIED Addendum to the 2013 Western Prairie Fringed Orchid Habitat Survey
- Appendix S CONFIDENTIAL—NOT USG CLASSIFIED Western Prairie Fringed Orchid and Small White Lady's Slipper Habitat Survey Report Nebraska Mainline Alternative Route

Appendix T	CONFIDENTIAL—NOT USG Orchid and Small White Lady's	CLASSIFIED 20 Slipper Survey Rep	018 Western port	Prairie	Fringed
Appendix U	CONFIDENTIAL—NOT USG Western Prairie Fringed Orchid	CLASSIFIED Up	dated 2018 H	labitat Re	eport for
Appendix V	CONFIDENTIAL—NOT USG	CLASSIFIED Pre-	2013 Survey	Reports	
Appendix W	CONFIDENTIAL—NOT USC Sampling Report June 2019	G CLASSIFIED	American	Burying	Beetle
Appendix X	CONFIDENTIAL—NOT USC Sampling Report, Tripp County,	G CLASSIFIED South Dakota, Aug	American gust, 2019	Burying	Beetle

LIST OF TABLES

Table 1.4-1	Summary of Species Included in Analysis and Findings9
Table 1.4-2	Summary of Species and Habitat Surveys10
Table 2.6-1	Summary of Lands Affected for the Proposed Project
Table 2.6-2	Disturbance of Federal Lands Administered by BLM22
Table 2.6-3	Power Line and Substation Attributes and Extents
Table 3.2-1	Occurrence Surveys for the Interior Least Tern within 0.25 Mile of the Proposed Project Route in 2008, 2011, 2012, 2013, and 2019
Table 3.2-2	Likelihood of Spills Occurring within the Range of the Interior Least Tern47
Table 3.2-3	Miles of Proposed Pipeline and Power Lines within the 95 Percent Whooping Crane Migration Corridor
Table 3.2-4	Historical and Recent Telemetry Locations Documented Within Montana, North Dakota, South Dakota, Nebraska, and Kansas Counties within 5 Miles of the Action Area
Table 3.2-5	Likelihood of Spills Occurring within the Range of the Whooping Crane
Table 3.2-6	Whooping Crane Occurrence Relative to Proposed New Power Lines74
Table 3.2-7	Likelihood of Spills Occurring within the Range of the Pallid Sturgeon83
Table 3.2-8	Likelihood of Spills Occurring within the Range of the Topeka Shiner
Table 3.2-9	Suitability Ratings of American Burying Beetle Habitat along Proposed Pipeline in South Dakota
Table 3.2-10	Suitability Ratings of American Burying Beetle Habitat in South Dakota along Power Line to PS-21
Table 3.2-11	Suitability Ratings of American Burying Beetle Habitat along Proposed Pipeline in Nebraska

Table 3.2-12	Suitability Ratings of American Burying Beetle Habitat in Nebraska along Power Line to PS-22
Table 3.2-13	Estimated American Burying Beetle Habitat Area in South Dakota Affected by the Proposed Pipeline System
Table 3.2-14	Estimated American Burying Beetle Habitat Area in Nebraska Affected by the Proposed Pipeline System
Table 3.2-15	Estimated Number of Individual American Burying Beetles Affected During Pipeline System Construction
Table 3.2-16	Estimated Number of Individual American Burying Beetles Affected by Heat from Pipeline Operations
Table 3.2-17	Estimated Number of American Burying Beetles Affected by Pipeline Repairs 119
Table 3.2-18	Estimated Number of American Burying Beetles Affected by Spills
Table 3.2-19	Estimated Number of Individual American Burying Beetles Affected During Power Infrastructure Construction
Table 3.2-20	Estimated Total Number of American Burying Beetles Affected123
Table 3.3-1	Likelihood of Spills Occurring within the Range of the Northern Long-eared Bat
Table 3.3-2	Occurrence Surveys for the Piping Plover along the Proposed Project Right-of-Way in 2008, 2011, 2012, 2013, and 2019
Table 3.3-3	Western Prairie Fringed Orchid Habitat within Proposed Pipeline System160
Table 3.3-4	Likelihood of Spills Occurring within the Range of the Western Prairie Fringed Orchid
Table 3.4-1	Potentially Suitable Habitat Affected by Pipeline Construction
Table 3.4-2	Potentially Suitable Habitat Overlapping Proposed Power Line ROWs168
Table 3.4-3	Potentially Suitable Habitat Affected by Electrical Substations
Table 3.4-4	Determination Summary

LIST OF FIGURES

Figure 2-1	Proposed Federal Decisions	13
Figure 2.6-1	Proposed Project Overview	17
Figure 2.6-2	Proposed Project Overview (Montana)	18
Figure 2.6-3	Proposed Project Overview (South Dakota)	19
Figure 2.6-4	Proposed Project Overview (Nebraska)	20

Figure 3.2-1	Central Flyway Whooping Crane Migration Corridor for the Aransas-Wood Buffalo Population
Figure 3.2-2	Whooping Crane Flyway Sightings and Telemetry Data in Montana55
Figure 3.2-3	Whooping Crane Sightings and Telemetry Data in South Dakota56
Figure 3.2-4	Whooping Crane Sightings and Telemetry Data in Nebraska57
Figure 3.2-5	Whooping Crane Abundance on the Wintering Grounds on or near the Aransas National Wildlife Refuge, Texas
Figure 3.2-6	Pallid Sturgeon Management Units and Proposed Project Elements
Figure 3.2-7	Predicted Distribution of American Burying Beetle near the Proposed Project, as Modeled by Leasure and Hoback (2017)
Figure 3.2-8	Predicted Distribution of American Burying Beetle near the Proposed Project, as Modeled by Jenkins et al. (2018)
Figure 3.2-9	American Burying Beetle Habitat Ratings in South Dakota and Nebraska97
Figure 3.2-10	Results of 2012 Sampling for the American Burying Beetle
Figure 3.2-11	Trap Data (1999–2012) where American Burying Beetle per Trap-Night for Three Trap-Nights are Plotted (with a 5-mile Buffer) as an Estimate of American Burying Beetle Density
Figure 3.2-12	Results of 2018 Sampling for American Burying Beetle107
Figure 3.2-13	Results of 2019 Sampling for American Burying Beetle

ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
ACAS	Avian Collision Avoidance System
APLIC	Avian Power Line Interaction
	Committee
applicant	TransCanada Keystone Pipeline, LP
AWBP	Aransas-Wood Buffalo Population
BA	Biological Assessment
BFD	bird flight diverter
BLM	Bureau of Land Management
BMP	best management practice
CEA	cumulative effects assessment
CFR	Code of Federal Regulations
CL ROW	centerline of the right-of-way
CMRP	Construction, Mitigation, and Reclamation Plan
Department	U.S. Department of State
dilbit	diluted bitumen
EIS	Environmental Impact Statement
ERM	Environmental Resources Management
ESA	Endangered Species Act
Fed. Reg.	Federal Register
GHG	greenhouse gas
GIS	geographical information system
HDD	horizontal directional drilling
IPaC	Information for Planning and Conservation
Keystone	TransCanada Keystone Pipeline, LP
kV	kilovolt
MALAA	may affect, likely to adversely affect
MAR	Mainline Alternative Route
MFWP	Montana Fish, Wildlife, and Parks
MNHP	Montana Natural Heritage Program
MP	milepost
NA	not applicable
NDEQ	Nebraska Department of Environmental Quality
NGPC	Nebraska Game and Parks Commission
NLAA	may affect, not likely to adversely affect
NNHP	Nebraska Natural Heritage Program
NPPD	Nebraska Public Power District
PCN	pre-construction notification

PPD	Public Power District
PS	pump station
ROW	right-of-way
RUS	Rural Utilities Service
SDGFP	South Dakota Game, Fish, and Parks
SDNHP	South Dakota Natural Heritage Program
SEIS	Supplemental Environmental Impact Statement
SPCC	Spill Prevention, Control, and Countermeasure
USACE	U.S. Army Corps of Engineers
USC	United States Code
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAPA	Western Area Power Administration
WNS	white-nose syndrome

1. INTRODUCTION

1.1. SECTION 7 ESA PROCESS

This Biological Assessment (BA) evaluates the potential effects of TransCanada Keystone Pipeline, LP's (Keystone) proposed Keystone XL Pipeline Project on federally protected and candidate species and federally designated critical habitat. Federal agencies, in coordination with the U.S. Fish and Wildlife Service (USFWS), are required to ensure that any action they authorize, fund, or carry out does not result in jeopardy to federally listed threatened or endangered species or result in the destruction or adverse modification to federal designated critical habitat.

When a proposed federal action may affect a federally listed species, Section 7 consultation pursuant to the Endangered Species Act (ESA) is required with the USFWS. A BA is required if protected species or their critical habitat may be present in the area affected by any aspect of a proposed federal action. An assessment of potential effects to ESA-listed species is presented in this document for the proposed Keystone XL Pipeline Project, regardless of whether the actions are federal or non-federal (Keystone or other).

1.2. SECTION 10 ESA: HABITAT CONSERVATION PLAN

As stated above, federal agencies are required to determine whether their actions may affect federally listed or proposed species, as well as designated and proposed critical habitat. This BA documents agency conclusions and provides rationale to support those conclusions. Although this BA evaluates potential effects of the entire Project on listed species, the area where incidental take of federally listed species (i.e., the American burying beetle [*Nicrophorus americanus*]) occurs is on non-federal lands, which are substantially outside the scope of federal agency authority. That is, federal agencies will not be able to implement or enforce implementation of any reasonable and prudent measures required by the USFWS through a Biological Opinion. Therefore, incidental take resulting from applicant activities on non-federal lands will be addressed under section 10(a)(1)(B) of the ESA. The applicant, Keystone, is developing a Habitat Conservation Plan to support its application to the USFWS for a section 10(a)(1)(B) incidental take permit for the American burying beetle. The Habitat Conservation Plan and Section 10 process is separate from this BA.

1.3. CONSULTATION HISTORY

In 2008, as a result of Keystone filing an initial Presidential Permit application to the U.S. Department of State (the Department), the Department appointed Keystone and its subcontractors to act as its designated non-federal representatives for Section 7 ESA consultation. In April 2008, Keystone, on behalf of the Department, initiated consultation with the USFWS, the Bureau of Land Management (BLM), and state agencies to identify species and habitats of concern. No National Marine Fisheries Service-listed species were determined to be within the proposed Project area. Lists of species and habitats potentially affected by the proposed Project were compiled for further analysis after meeting with USFWS, BLM, and associated state agencies. Keystone developed

field survey protocols, identified targeted survey areas, and developed survey schedules using this information.

Keystone submitted these survey protocols, target areas, and schedules to the appropriate agencies for review and comment in spring 2008. Agency review and approval of survey protocols began in 2008. Keystone filed documentation of agency correspondence associated with the review and approval process with the Department in November 2008, July 2009, June 2010, and November 2010. The Department completed a 2011 BA (Department 2011a) and a 2011 Environmental Impact Statement (EIS) (Department 2011b) for Project as proposed at that time.

In September of 2011, the USFWS released a Biological Opinion with an incidental take statement for the American burying beetle in South Dakota, Nebraska, and Oklahoma. Subsequently, the USFWS withdrew the Biological Opinion at the Department's request, based on Keystone's agreement with Nebraska to reroute the pipeline in Nebraska to avoid the Nebraska Department of Environmental Quality (NDEQ)-identified Sand Hills Region. Keystone then filed a new Presidential Permit application with the Department (May 2012), triggering the preparation of a Supplemental EIS (SEIS) for the revised Project (Department 2012a). In June 2012, the Department reinitiated Section 7 ESA consultation for the May 2012 Keystone XL Pipeline Presidential Permit application. Keystone submitted an applicant-prepared Draft BA for the proposed Project in September 2012. For the new application, the Department did not designate Keystone as the non-federal representative. Keystone did not include the Gulf Coast portion of the previous Keystone XL Project in its May 2012 application; instead, Keystone decided to pursue the Gulf Coast Project as a stand-alone project with independent utility. That project received the necessary permits from relevant federal and state agencies and is now in operation.

In May 2013, the USFWS issued a Biological Opinion to the Department that addressed potential effects of the proposed Project to seven federally protected species (USFWS 2013a). It also listed four additional endangered species that would not be affected by the proposed Project and discussed conservation measures for another two species that were candidates for listing under the ESA. The Biological Opinion was based on the content of Keystone's BA dated December 21, 2012, which was later attached to a 2014 Final SEIS (Department 2014). The Department determined in the BA that the proposed Project "may affect and is likely to adversely affect" the American burying beetle.

The USFWS's concurrence and 2013 Biological Opinion, as well as the 2012 BA on which they were based, are no longer in effect. This is because they were set aside and remanded to the respective agencies for reconsideration by a November 8, 2018, ruling in the U.S. District Court for the District of Montana, Great Falls division. The present analysis does not rely on their earlier findings and decisions.

In 2015, two additional species became federally listed as threatened: the northern long-eared bat (*Myotis septentrionalis*) and the rufa red knot (*Calidris canutus rufa*). The rufa red knot was designated a threatened species effective January 12, 2015. On July 9, 2015, the Department submitted a biological evaluation and requested USFWS concurrence with its determination that the proposed Project "may affect, but is not likely to adversely affect" the rufa red knot (Department 2015); on August 27, 2015, the USFWS concurred (USFWS 2015). The northern

long-eared bat was designated a threatened species effective April 2, 2015, and a final 4(d) rule defining take was published on January 14, 2016. On March 15, 2017, the Department reinitiated consultation with USFWS regarding the northern long-eared bat. On March 16, 2017, consultation was completed, with USFWS concurring with the Department's conclusion that the proposed Project "may affect, but is not likely to adversely affect" the species. Therefore, the Department and USFWS concluded Section 7 consultation with regard to both the rufa red knot and the northern long-eared bat for the proposed Project as it was proposed at that time.

Since then, a portion of the proposed Project in Nebraska has been rerouted to avoid effects on sensitive areas and to maximize the use of existing right-of-way (ROW). This new route segment, designated as the Mainline Alternative Route (MAR), is discussed in detail in the 2018 MAR Draft SEIS (Department 2018). The proposed Project footprint through Montana and South Dakota is essentially the same as that reviewed and assessed for the previously proposed Project. In January 2018, the Department reinitiated consultation with the USFWS regarding the Keystone XL Project and analysis of the MAR through Nebraska, requesting any new information on potentially affected species along the MAR. Supporting consultation letters and communications related to the rufa red knot, northern long-eared bat, and MAR are located in Appendix A of the 2018 MAR Draft SEIS (Department 2018) and in Appendix A (Letters of Section 7 Consultation and Supporting Communications) of this BA.

On March 29, 2019, the President of the United States issued a Presidential Permit authorizing construction, connection, maintenance, and operation of the proposed Project at the United States-Canada border. As a result, there is no longer any action for the Department to take in respect to the proposed Project. However, other federal agencies still have pending decisions regarding the proposed Project. On May 6, 2019, the Department and USFWS withdrew the 2012 BA and 2013 Biological Opinion.

This 2019 BA addresses the effects the proposed Project may have on federally protected species along the entire proposed Project, including the electrical transmission and distribution lines and substations necessary to power the proposed Project. Updated information regarding the risk of oil spills has also been incorporated, as has new whooping crane telemetry and observation data and additional survey data for several species.

Biological field surveys within the proposed Project footprint (e.g., pipeline ROW, pump stations, access roads, pipe yards, contractor yards, extra workspace) were conducted each year from 2008 to 2019. The following list summarizes Keystone's agency correspondence, species-specific survey information, and continued coordination with the USFWS regarding coordination of biological surveys and determination of biological effects for the proposed Project (see Appendix A, Letters of Section 7 Consultation and Supporting Communications, for additional consultation information):

• <u>April 2008, Multiple Agencies</u>: Keystone sent initial coordination letters to the appropriate Montana, South Dakota, and Nebraska USFWS, BLM, and state wildlife agency offices, as well as state natural heritage programs to request their input on identifying prominent terrestrial and aquatic resource issues or concerns that may occur within or adjacent to the ROW, focusing on species that are either sensitive (e.g., federally listed); have high economic value (e.g., big

game, waterfowl); or are considered important resources (e.g., raptors, fish). The coordination letters included state-specific special status species tables compiled from data received from each state, USFWS, and BLM, with brief descriptions of species habitat, miles of potential habitat crossed by the proposed Project, and approximate mileposts (MPs) where potential habitat was identified along the ROW.

- <u>May 5, 2008, USFWS/Nebraska Game and Parks Commission (NGPC)</u>: Keystone held an agency meeting at the NGPC office in Lincoln, Nebraska, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the proposed Project area. Attendees included representatives from USFWS and NGPC. The goal was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocols and best management practice (BMP) documents for future agency verification.
- <u>May 8, 2008, USFWS/Montana Fish, Wildlife, and Parks (MFWP)</u>: Keystone held an agency meeting at the MFWP office in Helena, Montana, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the proposed Project area (AECOM 2008c). Attendees included representatives from USFWS and MFWP. The goal was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocol and BMP documents for future agency verification. MFWP requested a follow-up meeting with additional technical staff from MFWP (Regions 6 and 7).
- June 10, 2008, USFWS/South Dakota Game, Fish, and Parks (SDGFP): Keystone held an agency meeting with staff from USFWS and SDGFP at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the proposed Project area (AECOM 2018e). The goal was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocol and BMP documents for future agency verification.
- July 29, 2008, MFWP/BLM: Keystone held an agency meeting with staff from the BLM Glasgow Field Office and MFWP Regions 6 and 7 at the MFWP office in Glasgow, Montana, to discuss issues pertaining to wildlife, special status species, and sensitive habitat that could potentially occur in the proposed Project area. The goal was to gather input on agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated comments from the meeting into survey protocol and BMP documents for future agency verification.
- January/February 2009, Multiple Agencies: Keystone sent a coordination package to the applicable USFWS, BLM, and state wildlife agency offices for Montana, South Dakota, and Nebraska that included state-specific special status species survey protocol and BMP documents for the species identified as potentially occurring during the 2008 meetings. A

summary of the findings from the 2008 biological field surveys was included in the discussions (AECOM 2009b, c).

- January 27, 2009, USFWS/SDGFP: Keystone held an agency meeting with staff from USFWS and SDGFP at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to special status species surveys. The goal of this meeting was to verify Keystone's survey approach, BMPs, discuss required field surveys, and review the information that was sent to the USFWS in the January/February 2009 coordination package. The USFWS and SDGFP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- <u>February 3, 2009, BLM/MFWP</u>: Keystone held an agency meeting with staff from the BLM Glasgow Field Office and MFWP Regions 6 and 7 at the MFWP office in Glasgow, Montana, to discuss issues pertaining to special status species surveys (AECOM 2009d). The goal of this meeting was to verify Keystone's survey approach and BMPs, discuss required field surveys, and review the information sent to the USFWS in the January/February 2009 coordination package. The BLM and MFWP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- <u>February 5, 2009, BLM</u>: Keystone held a conference call in lieu of an agency meeting with staff from the BLM Glasgow, Malta, and Miles City field offices to discuss issues pertaining to special status species surveys (AECOM 2009c). The goal of this meeting was to verify Keystone's survey approach and BMPs, discuss required field surveys, and review the information sent to the USFWS in the January/February 2009 coordination package. The BLM provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- <u>February 19, 2009, USFWS/NGPC</u>: Keystone held an agency meeting with staff from USFWS and NGPC at the NGPC office in Lincoln, Nebraska, to discuss issues pertaining to special status species surveys. The goal of this meeting was to verify Keystone's survey approach and BMPs, discuss required field surveys, and review the information sent to the USFWS in the January/February 2009 coordination package. The USFWS and NGPC provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- June 25, 2009, USFWS, Pierre, South Dakota Ecological Services Field Office: Keystone called Charlene Bessken, USFWS Pierre, South Dakota, Field Office regarding geotech activity clearance. The USFWS requested formal consultation with the Department to address take of the American burying beetle in South Dakota.
- <u>March 2, 2010, USFWS</u>: Keystone held a conference call with USFWS on threatened and endangered and U.S. Migratory Bird Treaty Act Surveys. The goal of the call was to discuss helicopter survey windows for raptors/rookeries and bald eagles (*Haliaeetus leucocephalus*) in 2010. The need for conducting additional pedestrian surveys for piping plovers (*Charadrius melodus*) was also discussed.

- <u>September 3, 2010, Multiple Agencies</u>: A meeting was held between USFWS, Keystone, the Department, and Cardno ENTRIX regarding the Section 7 ESA consultation for the Keystone XL Pipeline Project.
- <u>September 9, 2010, Multiple Agencies</u>: A meeting was held between USFWS, BLM, and Keystone regarding mitigation and construction stipulations for greater sage-grouse (*Centrocercus urophasianus*).
- <u>October 12, 2010, Multiple Agencies</u>: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle.
- January 7, 2011, Multiple Agencies: A meeting was held between USFWS, Keystone, and Cardno ENTRIX to discuss USFWS comments on the preliminary 2011 BA.
- January 12, 2011, Multiple Agencies: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 consultation on the American burying beetle.
- <u>February 2, 2011, Multiple Agencies</u>: Meetings continued between USFWS, Keystone, the Department, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle.
- <u>February 17, 2011, USFWS and the Department</u>: A meeting was held between USFWS, the Department, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle.
- <u>March 24, 2011, USFWS, Keystone, the Department, NGPC</u>: Meetings continued between USFWS, NGPC, Keystone XL, and the Department regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle.
- <u>April 21, 2011, Keystone and the Department</u>: Meetings continued regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle.
- <u>April 27, 2011, USFWS and the Department</u>: Meetings continued regarding the Keystone XL Pipeline Project's Section 7 ESA consultation on the American burying beetle. USFWS and the Department discussed monitoring and habitat restoration bonding.
- <u>May 19, 2011</u>: The Department submitted the 2011 BA to the USFWS with a letter requesting initiation of formal consultation.
- <u>August 26, 2011</u>: The Department issued the Final EIS to cooperating agencies and the public.
- <u>September 6, 2011</u>: USFWS issued their 2011 Biological Opinion on the Effects to Threatened and Endangered Species from the Construction and Operation of the Proposed Keystone XL Pipeline.
- <u>December 20, 2011</u>: The Department requested that the USFWS withdraw their 2011 Biological Opinion for the proposed Keystone XL Project.

- <u>December 21, 2011</u>: The USFWS withdrew their 2011 Biological Opinion for the proposed Keystone XL Project.
- June 27, 2012, USFWS, the Department, BLM, Montana Department of Environmental Quality, MFWP: Discussion between USFWS, the Department, BLM, Montana Department of Environmental Quality, and MFWP on the proposed Keystone XL Project to discuss proposed Project status and schedule.
- July 6, 2012, USFWS, the Department, BLM: Meetings continued regarding the Section 7 ESA consultation for the proposed Project application.
- <u>August 28, 2012</u>: The Department submitted a species list of federally protected and candidate species and federally designated critical habitat to USFWS for the proposed Project and requested that USFWS verify that list and information pertaining to federally protected and candidate species and federally designated critical habitat.
- <u>September 7, 2012</u>: Keystone submitted the TransCanada Keystone XL Pipeline Project Environmental Report (exp Energy Services 2012) to the Department with an applicant-prepared Draft BA.
- <u>September 28, 2012</u>: USFWS submitted a Technical Assistance letter for the proposed Project with a list of species that may occur in the proposed Project area.
- <u>October 9, 2012, USFWS, the Department, Keystone, BLM, NGPC, NDEQ, MFWP</u>: A meeting was held between USFWS, the Department, Keystone, BLM, NGPC, NDEQ and MFWP regarding the proposed Project's Section 7 ESA consultation including the American burying beetle.
- <u>October 10, 2012, USFWS, Department, Keystone, BLM, NGPC, NDEQ, MFWP</u>: Meetings continued between USFWS, the Department, Keystone, BLM, NGPC, NDEQ, and MFWP regarding the proposed Project's Section 7 ESA consultation including the American burying beetle, and on state-protected species, the Draft BA, species surveys, avoidance, minimization, and compensation measures.
- <u>October 23, 2012, USFWS, Department, SDGFP, BLM, Keystone</u>: Meeting between USFWS, the Department, SDGFP, BLM, and Keystone regarding the greater sage-grouse and a compensatory mitigation plan for the species in South Dakota.
- <u>December 21, 2012</u>: The Department submitted the BA to USFWS (Department 2012b).
- <u>May 15, 2013</u>: USFWS transmitted a Biological Opinion to the Department in response to the 2012 BA (USFWS 2013a).
- January 2014: 2014 Final SEIS published, which included the 2012 BA, 2013 Biological Opinion, and supporting meeting summaries, consultation letters, and communications.
- <u>July 9, 2015</u>: The Department reinitiated consultation with USFWS regarding the rufa red knot, determining the Keystone XL Project "may affect, but is not likely to adversely affect" the species and asking USFWS for concurrence (Department 2015).

- <u>August 27, 2015</u>: USFWS concurred with the "may affect, but is not likely to adversely affect" determination for the rufa red knot (USFWS 2015).
- <u>March 15, 2017</u>: The Department reinitiated consultation with USFWS regarding the northern long-eared bat, determining the Keystone XL Project "may affect, but is not likely to adversely affect" the species. The letter also re-evaluated the conclusions drawn during the 2014 Final SEIS consultation process and determined that it was not necessary to reinitiate consultation for any other species at that time.
- <u>March 16, 2017</u>: USFWS concurred with the "may affect, but is not likely to adversely affect" determination for the northern long-eared bat providing conservation measures listed in the March 15, 2017, letter are implemented (USFWS 2017a). The USFWS also agreed with the Department that the conclusions for the species in the 2013 Biological Opinion remained valid predicated on the completion of required pre-construction population surveys for the federally endangered American burying beetle to confirm the amount of take authorized in the Incidental Take Statement will not be exceeded for the species.
- January 31, 2018: The Department reinitiated consultation with USFWS regarding the Keystone XL Project and analysis of the MAR, requesting any new information on potentially affected species along the MAR.
- <u>March 7, 2018</u>: Meeting of Department with USFWS in Nebraska.
- <u>May 10, 2018</u>: Meeting of Department with USFWS in Nebraska.
- June 15, 2018: Meeting of Department with cooperating agencies in Lincoln, Nebraska, regarding the ESA.
- <u>September 21, 2018</u>: Conference call with USFWS and Department.
- <u>September 24, 2018</u>: Department publishes the 2018 MAR Draft SEIS, which includes supporting Section 7 consultation meeting summaries, letters, and other communications.
- <u>November 5, 2018</u>: Conference call with USFWS and Department.
- <u>November 2018 through September 2019</u>: Continued informal consultation involving numerous conference calls, meetings, and coordination between USFWS and participating federal agencies.
- <u>December 3, 2018</u>: Department publishes a Notice of Intent to prepare a new SEIS for the Keystone XL Project that includes new information that has become available.
- <u>May 6, 2019</u>: The Department and USFWS withdraw the 2012 BA and 2013 Biological Opinion.

1.4. ANALYSIS SUMMARY

This analysis addresses 10 federally protected species that were identified as potentially occurring in the proposed Project area or in its general vicinity. Table 1.4-1 summarizes these species and the preliminary effect determinations based on: (1) correspondence with the USFWS, participating federal agencies, and state wildlife agencies; (2) habitat requirements and the known distribution of these species within the proposed Project area; (3) habitat analyses and field surveys that were conducted for these species from 2008 through 2018 (see Table 1.4-2 for survey details); and (4) USFWS whooping crane (*Grus americana*) telemetry data collected by the U.S. Geological Survey (USGS) and provided by USFWS (Nebraska Ecological Services Office) in December of 2018. Potential effects associated with electrical infrastructure for the proposed pipeline have also been assessed within this update based on the best available data. Areas along proposed power line routes have not yet been field surveyd¹ for the presence of protected species or their habitats; therefore, the potential for each species to occur along power line routes was evaluated based on a review of aerial imagery and on reviews of species occurrence records in state databases. In addition to areas having documented occurrences, an area was determined to have potential for presence of a listed species where it contains one or more land cover type(s) serving as potentially suitable habitat for the species (forest, sandbar, etc., depending on species) and is within the known current range of that species.

		Fadaral	Detailed	Findings	
Common Name	Scientific Name	Status	Included	Summary	
Mammals				·	
Black-footed ferret	Mustela nigripes	Endangered/ Experimental Populations	Yes	NLAA/NLAA	
Northern long-eared bat	Myotis septentrionalis	Threatened	Yes	MA	
Birds					
Interior least tern	Sternula antillarum	Endangered	Yes	NLAA	
Piping plover	Charadrius melodus	Threatened	Yes	NLAA	
Rufa red knot	Calidris canutus rufa	Threatened	Yes	NLAA	
Whooping crane	Grus americana	Endangered	Yes	NLAA	
Fish					
Pallid sturgeon	Scaphirhynchus albus	Endangered	Yes	NLAA	
Topeka shiner	Notropis topeka	Endangered	Yes	NLAA	
Invertebrates					
American burying beetle	Nicrophorus americanus	Endangered	Yes	MALAA	
Plants					
Western prairie fringed orchid	Platanthera praeclara	Threatened	Yes	NLAA	

 Table 1.4-1
 Summary of Species Included in Analysis and Findings

MA = may affect; MALAA = may affect, likely to adversely affect; NLAA = may affect, not likely to adversely affect

¹ If additional information becomes available during the Section 7 consultation process, that information will be included as updated best available science in the assessment.

Species or Habitat	Dates of Surveys	Portion of Proposed Project	See Appendix
Interior least tern (<i>Sternula antillarum</i>) and/or	July 2008	Pipeline route crossings (for the route assessed in the 2011 Final EIS) of Niobrara, Cheyenne, and Platte rivers.	V
piping plover (Charadrius melodus)	June and July 2011	Pipeline route crossings (for the route assessed in the 2012 Draft SEIS) of Missouri, Yellowstone, Cheyenne, Niobrara, and Platte rivers.	V
	June and July 2012	Pipeline route crossings (for the route assessed in the 2014 Final SEIS) of Niobrara, Elkhorn, and Platte rivers.	V
	June 2013	Pipeline route crossings (for the route assessed in the 2014 Final SEIS) of Missouri, Yellowstone, Cheyenne, and Platte rivers. Note, access was not allowed at the Niobrara River.	G
	June and July 2019	Pipeline route crossings of the Missouri, Yellowstone, Cheyenne, Niobrara, and Platte rivers.	V
Topeka shiner (Notropis topeka)	May 2013	Pipeline route crossings (for the route assessed in the 2014 Final SEIS) of Wolk, Spotted Tail, and Big creeks, Nebraska. Note access was not allowed at Alkali, Beaver, or Big Sandy creeks.	Н
	June and August 2018	MAR pipeline crossing of Union Creek, Nebraska	Ι
American burying beetle (Nicrophorus americanus)	2008	Driving or desktop survey of pipeline ROW as planned at that time	V
	June 2009	Jefferson, Saline, Fillmore, and York counties, Nebraska	V
	June 2010	Southern Holt County, Nebraska	V
	August 2010	Keya Paha, Rock, and northern Holt counties, Nebraska	V
	September 2012	Northern Keya Paha, Western Boyd, Eastern Holt and Antelope counties, Nebraska	J
	June 2013	Auxiliary sites in Tripp County, South Dakota	K
	June 2018	MAR pipeline route	L
	August 2018	MAR pipeline route	М
	June and August 2019	2019 pipeline route and auxiliary sites	W, X

Table 1.4-2Summary of Species and Habitat Surveys

Species or Habitat Targeted	Dates of Surveys	Portion of Proposed Project Surveyed	See Appendix
Northern long-eared bat (Myotis septentrionalis)	June 2013	Pipeline route crossings (for the route assessed in the 2014 Final SEIS) of Missouri and Yellowstone rivers, numerous stream crossings in Nebraska	N
	June 2014	2014 pipeline route, power lines routes except in Nebraska	0
	April through June 2018	MAR pipeline route	Р
Rufa red knot (Calidris canutus rufa)	June 2014	2014 pipeline route, power lines routes except in Nebraska	0
Western prairie fringed orchid	June 2009	Portions of the 2011 Final EIS pipeline route	V
(Platanthera praeclara)	June and July 2011	Portions of the 2012 Draft SEIS pipeline route	V
	May and June 2012	Portions of the 2014 pipeline route	V
	July 2013	Portions of the 2014 pipeline route	Q
	October/November 2013	Portions of the 2014 pipeline route	R
	May 2018	Portions of the MAR pipeline route	S
	July 2018	Portions of the MAR pipeline route	Т
	November 2018	Full pipeline route, power line routes except in Nebraska, general power line corridors in Nebraska	U
	July 2019	Portions of the pipeline route north of the Platte River and portions of the pipeline route south of the Keya Paha River	*

* = This report is not yet available, but results are summarized in Keystone 2019.

2. PROPOSED FEDERAL DECISIONS AND THE PROPOSED PROJECT

Several federal agencies are involved in some capacity with the proposed Project. The BLM, the Western Area Power Administration (WAPA), the Rural Utilities Service (RUS), and the U.S. Army Corps of Engineers (USACE) intend to rely on this document to fulfill their obligations under Section 7 of the ESA. The following sections describe the Proposed Federal Decisions for each agency. Figure 2-1 indicates the places that are subject to the Proposed Federal Decisions.

2.1. BLM

Because the proposed Project would cross federal lands managed by the BLM in Montana, the BLM is evaluating the proposed Project to respond to the Keystone application under Section 28 of the Mineral Leasing Act, as amended, for a ROW grant and Temporary Use Permit to construct, operate, maintain and decommission a crude oil pipeline and related facilities on federal lands in compliance with the Mineral Leasing Act, BLM ROW regulations, and other applicable federal laws. In coordination and concurrence with USACE, the ROW grant also requires Section 14 of the Rivers and Harbors Act of 1899, 33 United States Code (USC) 408 permission to make alterations to federal property administered by the USACE, provided it is determined the proposed alteration will not be injurious to the public interest and will not impair the usefulness of a Civil Works project. The BLM will decide whether to approve, approve with modification, or deny issuance of a ROW grant and Temporary Use Permit for the proposed Keystone XL pipeline system, and if approved, under what terms and conditions. The proposed Project pipeline ROW would cross 44.4 miles of BLM land in Montana.



Figure 2-1 Proposed Federal Decisions

2.2. WAPA

Part of WAPA's mission is to provide open access to transmission services across the federal power transmission system so that energy producers can transmit power to their customers. Any entity requesting transmission services across the federal grid system must submit an application for interconnection. WAPA has received interconnection applications from local power cooperatives to serve the electrical needs of Pump Station (PS)-09 through PS-13 and PS-17 through PS-19, as well as PS-21.

The proposed interconnections to WAPA's transmission system are federal actions. As a result, WAPA must evaluate the environmental impacts of entering into an interconnection agreement and completing any necessary work to WAPA's infrastructure to accommodate the interconnections as well as any interrelated non-federal actions (e.g., construction of power lines). The following provides a summary of WAPA's federal activities:

- PS-09—Construction and ownership of a new substation (the Bowdoin Substation) and interconnection;
- PS-10—An expansion of the existing Fort Peck Substation and interconnection;
- PS-11—Construction and ownership of a new substation and interconnection;
- PS-12—Interconnection and minimal work within the existing Circle Substation footprint to accommodate the interconnection;
- PS-13—An expansion of the existing O'Fallon Substation and interconnection;
- PS-17—Interconnection and minimal work within the existing Maurine Substation footprint to accommodate the interconnection;
- PS-18—Interconnection and minimal work within the existing Philip Substation footprint to accommodate the interconnection;
- PS-19—Expansion of the existing Midland Substation and interconnection; and
- PS-21—Rebuilding of the existing Gregory Substation and interconnection.

Additional information and analysis related to the power lines that would connect the abovementioned substations is provided in the analysis to follow.

2.3. RUS

RUS administers programs that provide rural areas with infrastructure and infrastructure improvements, including water and wastewater treatment, telecommunications services, and electric power. For electric power, RUS provides financing through loans and loan guarantees for the construction, operation, and improvement of electric transmission and generation facilities in rural areas. Power cooperatives in South Dakota have applied for RUS financing for the construction of power lines to deliver power to PS-15 through PS-21. RUS's action is to determine whether to provide federal financing to these electric cooperatives, thus allowing them to construct

and operate the transmission line facilities necessary to supply the proposed Project's pump stations with power.²

2.4. USACE

The proposed Project (as described in Section 2.6) would affect lands administered by the USACE at the Fort Peck Project; thus, the USACE is determining whether USACE may allow the BLM to include federal land administered by USACE for the Fort Peck Project in a ROW granted by BLM to Keystone for the installation of the Keystone XL pipeline on Fort Peck Project land. The USACE would also consider, upon notification by an applicant, whether to issue verifications under Section 10 of the Rivers and Harbors Appropriation Act of 1899 and/or under Section 404 of the Clean Water Act (33 USC 1344) for proposed Project activities involving dredging or filling in rivers, streams, or wetlands, and for any pipeline or power line construction over, under, or through navigable waters listed under Section 10.³ USACE anticipates receiving pre-construction notifications (PCNs) under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. The USACE expects PCNs for pipeline crossings at the Missouri River, the Yellowstone River, and the Cheyenne River. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. If any PCNs arrive for activities in Nebraska, USACE's decisions on potential Section 404 verifications would be the only federal decisions made in the state of Nebraska for the proposed Project.

2.5. SUMMARY OF PROPOSED FEDERAL DECISIONS

Collectively, the Proposed Federal Decisions comprise the decisions of the BLM, WAPA, RUS, and the USACE as described above. All other elements of Keystone's proposed pipeline system and the associated electric power infrastructure (the proposed Project) are separate from the Proposed Federal Decisions. The BLM and other federal agencies are not proposing to construct or manage the proposed Project; however, any effects on ESA-listed species resulting from the construction and operation of the proposed Project could be considered consequences of the Proposed Federal Decisions. Therefore, the potential effects of the proposed Project on protected species are evaluated as part of the effects of the Proposed Federal Decisions. Accordingly, the action area encompasses all areas affected by the proposed Project, as described in Section 2.6 and Appendix C.

² The power cooperatives could identify and secure alternate financing if RUS decides not to provide financing.

³ USACE regulates the discharge of dredged or fill material into waters of the United States under Section 404 Clean Water Act authorities and the construction of structures and work in navigable waters of the United States under Section 10 Rivers and Harbors Act authorities. Therefore, typically USACE does not have authority for the operations phase of a project. Furthermore, per 33 CFR, 2017 Issuance and Reissuance of Nationwide Permits, Final Rule, USACE does not direly regulate oil and gas pipelines, or other types of pipelines. For utility lines, including oil and gas pipelines, USACE's legal authority is limited to regulating discharges of dredged or fill material into waters of the United States and structures or work in navigable waters of the United States, under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899, respectively. USACE does not have the authority to regulate the operation of oil and gas pipelines, and does not have the authority to address spills or leaks from oil and gas pipelines.

2.6. SUMMARY OF THE PROPOSED PROJECT

2.6.1. Project Overview

Appendix C provides detailed descriptions of the proposed Project land requirements and other proposed Project elements, including an overview of pipeline construction and operation activities, ancillary facilities, temporary workspaces, construction camps, access roads, and other aboveground facilities, including power lines. A summary of the proposed Project follows below.

Keystone proposes to construct and operate a crude oil transmission system from an oil supply hub near Hardisty, Alberta, Canada, to destinations in the United States.

From north to south, the proposed Project extends from the United States/Canada border near Morgan, Montana, southeast to Steele City, Nebraska (see Figures 2.6-1 through 2.6-4). In total, the proposed Project would consist of approximately 882 miles of 36-inch diameter pipeline in the United States. The proposed Project would have the nominal capacity to deliver up to 830,000 barrels per day of crude oil.

As acknowledged in the 2014 Final SEIS, after completion of the analyses required under NEPA and under Section 7 of the ESA,

"Keystone will make minor adjustments to the proposed pipeline alignment during final design based on additional information obtained from field surveys or landowners. These minor route variations (microalignments) could be implemented to address specific landowner concerns, avoid certain features (such as structures, wells, or irrigation systems), minimize effects to environmental resources, or facilitate construction in such areas as steep terrain or waterbody crossings" (Department 2014, page 2.1-2).



Figure 2.6-1 Proposed Project Overview

17



Figure 2.6-2 Proposed Project Overview (Montana)



Figure 2.6-3 Proposed Project Overview (South Dakota)





20

2.6.2. Land Requirements

Surface disturbance associated with the construction and operation of the proposed Project in its entirety is summarized in Table 2.6-1. The amount of land affected during construction would total approximately 13,090 acres, of which approximately 8,304 acres would be overlapped by permanent ROW and/or occupied by permanent facilities. After construction, the temporary ROW would be restored and returned to its previous land use. With the exception of approximately 37 acres occupied by electrical substations and switching stations and approximately 282 acres occupied by permanent access roads and aboveground facilities, including pump stations and valves, disturbed acreage would be restored and returned to its previous aboveground land use after construction, although the permanent ROW along the pipeline and power line routes would be maintained to prevent the encroachment of woody vegetation for the life of the Project.

Almost all of the land affected by the construction and operation of the proposed Project would be privately owned. BLM oversees the management of the majority of the federally owned lands affected by the proposed Project. The permanent and temporary acreage effects of the proposed pipeline on BLM-administered lands are summarized in Table 2.6-2 and were part of the Plan of Development filed with the BLM.

State	Facility	Lands Affec	Lands Affected (acres)		
		Construction	Operations		
	Pipeline ROW	2,049.64	1,731.70		
	Additional Temporary Workspace Areas	683.12	0.00		
	Pipe Stockpile Sites	65.96	0.00		
	Contractor Yards	84.23	0.00		
	Construction Camp	207.90	0.00		
Montana	Pump Stations and Delivery Facilities	58.04	58.04		
	Access Roads	219.12	50.53		
	Rail Sidings	20.60	0.00		
	Power Line ROW ^a	1,457.65	1,457.65		
	Substations	18.11	18.11		
	Montana Subtotal ^b	4,839.43	3,309.18		
	Pipeline ROW	2,252.16	1,912.97		
	Additional Temporary Workspace Areas	580.57	0.00		
	Pipe Stockpile Sites	94.87	0.00		
	Contractor Yards	189.68	0.00		
	Construction Camp	80.20	0.00		
South Dakota	Water Storage	16.07	0.00		
	Pump Stations and Delivery Facilities	65.82	65.82		
	Access Roads	220.15	20.20		
	Rail Sidings	195.30	0.00		
	Power Line ROW ^a	979.38	979.38		
	Substations	15.03	15.03		

 Table 2.6-1
 Summary of Lands Affected for the Proposed Project

State	Facility	Lands Affected (acres)			
		Construction	Operations		
	South Dakota Subtotal ^b	4,671.86	2,986.47		
	Pipeline ROW	0.00	0.00		
	Additional Temporary Workspace Areas	0.00	0.00		
	Pipe Stockpile Sites	0.00	0.00		
	Construction Camp	0.00	0.00		
North Doboto	Pump Stations and Delivery Facilities	0.00	0.00		
North Dakota	Access Roads	0.00	0.00		
	Rail Sidings	5.00	0.00		
	Power Line ROW	0.00	0.00		
	Substations	0.00	0.00		
	North Dakota Subtotal ^b	5.00	0.00		
	Pipeline ROW	2,010.77	1,696.32		
	Additional Temporary Workspace Areas	392.39	0.00		
	Pipe Stockpile Sites	330.41	0.00		
	Contractor Yards	170.77	0.00		
	Construction Camp	89.19	0.00		
Nebraska	Pump Stations and Delivery Facilities	80.63	80.63		
	Access Roads	41.32	6.40		
	Rail Sidings	239.70	0.00		
	Power Line ROW ^a	234.63	234.63		
	Substations	3.50	3.50		
	Nebraska Subtotal ^b	3,573.43	2,007.98		
Total ^b		13,089.72	8,303.63		

^a No off-ROW access roads have been identified for the power lines at this time except for the power line to PS-13. Power line access roads, laydown areas, and pulling and tensioning areas would be completed within the ROW to the extent practicable. Any additional areas disturbed outside of the ROW would be subject to additional environmental review. During construction and operation of the power lines, not all of the ROW would be affected, and the area actually occupied by power pole structures would be negligible.

^b Subtotals and total are less than the sums of all individual facilities because certain facilities overlap. In Section 3, Effect Evaluation, the differing natures of potential effects from various factors are not necessarily representable by a sum of areas affected.

ROW = right-of-way

	Permanen	t ROW	Temporary Workspace	Additional Temporary Work Areas ^a	Pump Stations or Substations	
Proposed Project Components	Miles	Acres	Acres	Acres	Acres	
Pipeline	44.40	269.40	319.05	109.41	0.21	
Power Infrastructure	35.55	421.88	NA	NA	5.75	

NA = not applicable

^a See Appendix C for more information on additional temporary workspace areas.

The installation of the proposed 36-inch diameter pipeline would occur within a 110-foot-wide construction ROW, consisting of a 60-foot temporary construction ROW surrounding a 50-foot permanent ROW. The ROW during construction would be reduced to 85 feet in certain areas (e.g., some habitat for federally protected species, wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas). Descriptions of additional temporary workspaces, construction camps, and access roads are included in Appendix C.

2.6.3. Electrical Transmission and Distribution Lines and Substations

Local, non-federal power providers (typically called utilities or cooperatives) would provide electrical service to the Project. In some instances, new and/or upgraded electrical transmission and distribution lines (power lines) and substations would be needed in order to deliver power. The local utility or cooperative would be responsible for constructing any such power lines or substations, as well as obtaining the necessary permits, approvals, or authorizations from federal, state, and local governments. Further coordination between local power providers and applicable resource management agencies may be required to ensure the conservation of protected species and to obtain the necessary permits and approvals to construct and operate the power lines. Although local power providers would conduct the work and would avoid or minimize effects on protected species (see Appendix A, Letters of Section 7 Consultation and Supporting Communications), potential effects and conservation measures are analyzed within this BA according to species potentially affected.

In other instances, WAPA may need to construct new substation facilities or upgrade existing substation facilities. This BA describes the conservation measures that WAPA has committed to implement, as well as potential effects of WAPA federal actions.

Table 2.6-3 below provides a summary of the power line and substation information. Additional details are included in Appendix C.

2.6.4. Pipeline Incident Analysis

The likelihood of potential releases from the pipeline during operation was analyzed in the 2014 Final SEIS. This analysis has subsequently been updated using more recent information. A description of the updated pipeline incident analysis can be found in Appendix C. This BA includes an assessment of the potential effects on listed species from potential spills (see Chapter 3, Effect Evaluation).

Pump Station No.	County	Substation	Power Supplier	Voltage (kV)	Estimated Power Line Length (miles)	ROW Width (feet)	Estimated ROW (acres)	Approximate Number of Structures
PS-09	Phillips	Bowdoin ^b (new substation)	Big Flat Electric Cooperative	115	61.4	100	744.1	845
PS-10	Valley	Fort Peck ^b (expansion)	NorVal Electric Cooperative	115	48.8	80	473.2	1,036
PS-11	McCone	Coal Hill ^b (new substation)	NorVal Electric Cooperative	230	0.2	80	1.9	3 ^a
PS-12	McCone	Circle ^b	McCone Electric Cooperative	115	4.6	80	44.4	81
PS-13	Prairie	O'Fallon ^b (expansion)	Tongue River Electric Cooperative	115	15.7	80	152.4	251
PS-14	Fallon	Existing Source	Montana-Dakota Utilities Company	115	6.9	50	41.6	91 ^a
PS-15	Harding	Harding (expansion)	Grand Electric Cooperative	115	24.7	50	149.6	326 ^a
PS-16	Harding/ Perkins	Buffalo (expansion)	Grand Electric Cooperative	115	41.9	50	253.7	553 ª
PS-17	Meade	Maurine ^b	Grand Electric Cooperative	115	10.9	50	65.8	230 ^a
PS-18	Haakon	Philip ^b	West Central Electric Cooperative	115	26.0	50	157.2	320
PS-19	Haakon/ Jones	Midland ^b (expansion)	West Central Electric Cooperative	115	20.5	50	124.1	219
PS-20	Tripp	Witten	Rosebud Electric Cooperative	115	17.2	50	104.5	364
PS-21	Tripp/ Gregory	Gregory ^b (substation rebuild)	Rosebud Electric Cooperative	115	20.5	50	124.5	434
PS-22	Holt	Eagle Creek (new)	NPPD & Niobrara Valley Electric	115	2.5	100	15.4	54

 Table 2.6-3
 Power Line and Substation Attributes and Extents

Pump Station No.	County	Substation	Power Supplier	Voltage (kV)	Estimated Power Line Length (miles)	ROW Width (feet)	Estimated ROW (acres)	Approximate Number of Structures
PS-23	Antelope	Existing Source	Elkhorn PPD	69	3.0	100	37.0	65
PS-23B	Platte	Existing Source	Cornhusker PPD	34.5	3.4	100	40.8	69 ^a
PS-24	Butler	Existing Source	Butler PPD	69	1.0	100	12.4	22 ª
PS-25	Seward	Existing Source	Norris PPD	69	9.3	100	112.2	197 ^a
PS-26	Jefferson	Existing Source	NPPD & Norris PPD	115	0.1	100	1.3	3

kV = kilovolt; NPPD = Nebraska Public Power District; PPD = Public Power District; ROW = right-of-way; WAPA = Western Area Power Administration

^a For lines where specific information was not available, the number of structures for 115-kV or 6.9-kV lines is based on an assumption of one structure every 400 feet, and the number of structures for 69-kV or 34.5-kV lines is based on an assumption of one structure every 250 feet.

^b WAPA substation

3. EFFECT EVALUATION

The Proposed Federal Decisions and subsequent construction, operation, and maintenance of the proposed Project could have consequences for protected species and their habitats. The action area encompasses all areas that would be affected by the proposed Project, as described in Section 2.6 and Appendix C. The following analyses evaluate potential effects on protected species that could result from the proposed Project activities that could occur following the Proposed Federal Decisions.

Keystone and the local power providers may make minor adjustments to their proposed alignments and temporary work spaces during final design. These minor route variations (microalignments) could be implemented to address specific landowner concerns, avoid certain features (such as structures, wells, or irrigation systems), minimize effects on environmental or cultural resources, or facilitate construction in such areas as steep terrain or waterbody crossings. This evaluation has utilized the best information available at the time. Microalignments may change the lengths of pipeline and/or power line, areas of ROW, and the number of power line support structures, but would not likely result in a substantial increase in these aspects of the proposed Project.

This effect evaluation section is divided into four parts. The first part describes the methodology used to assess cumulative effects on species of concern from the effects of the Proposed Federal Decisions combined with future state, tribal, local, or private actions that are reasonably certain to occur in the action area. The second and third parts address effects of the Proposed Federal Decisions on individual federally endangered and threatened species, respectively. The fourth part presents a summary of all effects on species of concern, including effects determinations.

3.1. CUMULATIVE EFFECTS ASSESSMENT METHODOLOGY

Under Section 7 of the ESA, cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area that could, when combined with the consequences of the Proposed Federal Decisions, contribute to effects on listed species. Future federal actions that are unrelated to the Proposed Federal Decisions are not considered because they would require separate consultation pursuant to Section 7 of the ESA if listed species could be affected. The cumulative effects assessment (CEA) for each species considers the residual effects of the Proposed Federal Decisions in combination with the residual effects from future state, tribal, local, or private actions that are reasonably certain to occur in the action area.

The methods for this CEA follow those specified by the USFWS ESA Consultation Handbook (USFWS and NMFS 1998) and 50 Code of Federal Regulations (CFR) 402. The scope of the CEA is limited to non-federal actions that are reasonably certain to occur within the action area and whose resource effects overlap in time and space with the resources affected by the Proposed Federal Decisions.

Although rare in occurrence, it is possible that accidental or emergency events may arise due to an unforeseen chain of events during the proposed Project's operational life. For an assessment of the potential short- and long-term effects of oil releases to the environment, see the 2014 Final SEIS

Section 4.13. For a discussion of potential cumulative effects of oil releases to the environment, see the 2014 Final SEIS Section 4.15.3.13.

The effects of climate change are not considered to represent a well-understood and imminent threat to the protected species discussed in this BA, with the exception of the American burying beetle as described in Section 3.2.6 below (USFWS 2019f). As described in the 2018 MAR Draft SEIS Section 6.3.4, greenhouse gas (GHG) emissions from the proposed Project would contribute incrementally to global climate change in combination with other global sources of GHG emissions; however, the potential contribution of the proposed Project would be negligible in relation to the global GHG emissions inventory. Further information can be found in the 2014 Final SEIS Section 6.3.4.

3.2. EFFECTS ON FEDERALLY ENDANGERED SPECIES

3.2.1. Black-footed Ferret—Endangered/Experimental Populations

3.2.1.1. Natural History and Habitat Association

The black-footed ferret was federally listed as endangered on March 11, 1967, under the Endangered Species Preservation Act of October 15, 1966 (80 Stat. 926; 16 USC 668aa(c)). Listing for the black-footed ferret was revised under the ESA on June 2, 1970 (Endangered Species Conservation Act, 35 Federal Register [Fed. Reg.] 8491 [June 2, 1970]). Designated non-essential experimental populations were reintroduced to sites in Wyoming, South Dakota, Montana, Arizona, Utah, and Colorado between 1991 and 2003 (USFWS 2008b). Members of non-essential experimental populations located outside national wildlife refuge or national park lands are protected as proposed species under the ESA (16 USC 1531 *et seq.*) and as threatened species where they occur on national wildlife refuges or national parks (Section 10(j)). Reintroductions of protected populations have occurred in South Dakota, Arizona, Kansas, Montana, and New Mexico (USFWS 2013c). Members of reintroduced populations within the species' historical range that have not been designated as experimental populations are protected as endangered.

Historically, the range of the black-footed ferret coincided closely with that of the black-tailed prairie dog (*Cynomys ludovicianus*), Gunnison's prairie dog (*C. gunnisoni*), and white-tailed prairie dog (*C. leucurus*) throughout the intermountain and prairie grasslands extending from Canada to Mexico (USFWS 2008b). The elimination of black-footed ferrets throughout their historical range is thought to be directly related to widespread disease outbreaks, primarily sylvatic plague, land-use modifications to its native rangeland habitat, and large-scale use of toxicants to control black-tailed prairie dogs, the ferret's primary prey species (USFWS 2008b). The black-footed ferret was thought to be extinct in 1979, when the last animal captured from a population in Mellette County, South Dakota, died in captivity (Fortenbery 1972; Hillman 1968; Henderson et al. 1969; Linder et al. 1972). In the wake of the rediscovery of the species in the wild in 1981 near Meeteetse, Wyoming, in 1989, the USFWS instituted the survey protocol Black-footed Ferret Survey Guidelines for Compliance with the ESA, designed to detect ferrets in potentially suitable habitats (Fitzgerald et al. 1994; USFWS 1988a). Despite the fact that thousands of hours of survey effort have been expended throughout the historical range of the species in an attempt to locate

additional extant populations, no other wild populations have ever been detected. The Wyoming population declined to only a few individuals, so the remaining animals in the wild were captured and used as the basis for an ongoing captive breeding program (USFWS 1988a).

No wild populations of black-footed ferrets have been found since the capture of the last black-footed ferret in Meeteetse, Wyoming; the captive black-footed ferret population is the primary species population. The failure to locate additional extant black-footed ferret populations, coupled with the ubiquity of sylvatic plague throughout the historical range of the species, has prompted the USFWS to determine that the black-footed ferret has been extirpated throughout its range, except where it has been purposely reintroduced using captive-reared or translocated wild individuals. Purposeful reintroduction of black-footed ferrets has occurred at 29 reintroduction sites in eight states since 1991 (USFWS 2013c).

Black-footed ferrets are solitary, primarily nocturnal carnivores that depend on prairie dogs (Fitzgerald et al. 1994). Over 90 percent of the black-footed ferret's diet is comprised of prairie dogs, and ferrets use prairie dog burrows as their sole source of shelter (Fitzgerald et al. 1994). Ferrets are most commonly observed in late summer or early fall (Hillman and Carpenter 1980). The black-footed ferret's close association with prairie dogs was an important factor in its decline (USFWS 2008b). Reasons for decline include habitat loss from conversion of native prairie to agriculture, poisoning of prairie dog towns, and disease (USFWS 2008b). No critical habitat has been designated for this species.

3.2.1.2. Potential Presence in Action Area

The action area crosses the historical range of the black-footed ferret in Montana, South Dakota, and Nebraska. Black-footed ferrets are not known to exist outside of reintroduced populations in the western United States. Eleven reintroductions of black-footed ferrets have occurred in Montana, South Dakota, and Kansas. These reintroductions occurred outside of the previous Keystone XL ROW (USFWS 2008b), and they remain outside the ROW of the current proposed Project.

Montana

Montana Natural Heritage Program (MNHP) data show no current records of black-footed ferrets occurring on or within 5 miles of the proposed pipeline ROW (MNHP 2019), including the portions of the ROW on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions. The last documented occurrence of a black-footed ferret in proximity to the proposed pipeline was in 1980 in Philips County, Montana, on non-federal lands. A review of the USFWS Information for Planning and Conservation (IPaC) system conducted in September of 2019 did not show the black-footed ferret on the list of endangered species near the action area (USFWS 2019b).

Since the black-footed ferret is dependent on prairie dogs, the assessment of potential presence was focused on black-tailed prairie dog colonies and complexes in Montana that would be encountered by the proposed Project. The action area does not overlap the known ranges of the Gunnison's prairie dog or the white-tailed prairie dog (NatureServe 2009). Aerial and/or pedestrian

field surveys were conducted from 2008 through 2012 along the entire proposed Project route in Montana to identify prairie dog towns crossed by the construction ROW. The current proposed Project route and associated ROW and work areas have been modified so that they do not encounter any known prairie dog towns. MNHP data indicate that black-tailed prairie dogs occur within the general area surrounding the proposed power lines to PS-09 and PS-10. However, a review of 2017 aerial imagery did not identify any prairie dog towns within at least 1 mile of either route, nor are any known to occur in the vicinity of either route based on previous raptor nest surveys conducted along the routes. A broad-scale study using aerial surveys from 2008 identified between 5 and 10 prairie dog towns within approximately 10 miles of one or the other power line route (Rauscher et al. 2013). Regardless, the USFWS no longer requires surveys for black-footed ferrets at any prairie dog town in Montana outside of re-introduction sites (Jeff Berglund, USFWS Fish and Wildlife Biologist, Federal Activities, Section 7, Pers. Comm., December 19, 2018). There appears to be little to no possibility of black-footed ferret presence within the action area in Montana.

South Dakota

Natural Heritage Program data for South Dakota (SDGFP 2008, 2019) contain no historical records of black-footed ferrets within 5 miles of the proposed pipeline ROW, including BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions. A review of the USFWS IPaC system conducted in September of 2019 did not show the black-footed ferret on the list of endangered species near the action area (USFWS 2019d). Additionally, black-tailed prairie dog towns in all of South Dakota are block-cleared by the USFWS Pierre Ecological Services Field Office, meaning the towns no longer contain any wild, free-ranging black-footed ferrets, and activities within these areas that result in the removal of the black-tailed prairie dogs and/or their habitat would no longer be required to meet the USFWS survey guidelines for black-footed ferrets or undergo consultations under Section 7 of the ESA (AECOM 2008a; SDGFP 2018; USFWS 2018a). There appears to be little to no possibility of black-footed ferret presence within the action area in South Dakota.

The only population of black-footed ferrets re-introduced in counties traversed by the proposed Project in any state is in Lyman County, South Dakota (USFWS 2013c), which contains a protected population on lands of the Lower Brulé Sioux Tribe more than 19 miles from the action area (SDGFP 2018). Given this distance, it is unlikely that wild populations of black-footed ferrets currently occur in the action area. In the unlikely event that future reintroduced ferrets would occur within the action area, take of these animals would not be permitted. However, land use activities near a non-essential experimental population would not be limited.

Nebraska

A review of the USFWS IPaC system conducted in September of 2019 did not show the blackfooted ferret on the list of endangered species near the action area (USFWS 2019c). During the meeting with Keystone representatives on May 5, 2008, the USFWS Grand Island Ecological Services Field Office had indicated that ferrets do not occur within the original proposed pipeline route in Nebraska and that proposed Project effects would be negligible. In 2012, the USFWS affirmed that the proposed pipeline route in Nebraska lacks suitable habitat and therefore was unlikely to affect the ferret (USFWS 2012). In addition, the MAR is also free of ferrets, as there are no experimental populations in Nebraska. Furthermore, according to the USFWS Pierre Ecological Services Field Office, black-tailed prairie dog towns in all of Nebraska are block-cleared, meaning the towns no longer contain any wild, free-ranging black-footed ferrets, and activities within these areas that result in the removal of the black-tailed prairie dogs and/or their habitat would no longer be required to meet the USFWS survey guidelines for black-footed ferrets or undergo consultations under Section 7 of the ESA (AECOM 2008a; SDGFP 2018; USFWS 2018a). There appears to be little to no possibility of black-footed ferret presence within the action area in Nebraska.

3.2.1.3. Conservation Measures

In Nebraska and South Dakota, the USFWS no longer requires black-footed ferret surveys in prairie dog towns. Pursuant to USFWS consultation to date, the USFWS believes that no potentially suitable habitat for black footed ferrets exists in the action area. However, Keystone, or electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the black-footed ferret and potentially suitable habitat for the species.

- Keystone will provide USFWS with the results of Montana prairie dog town surveys and continue to coordinate with the Montana USFWS Ecological Services Office to determine the need for black-footed ferret surveys, in accordance with the USFWS Black-footed Ferret Survey Guidelines (USFWS 1989).
- Workers will be prohibited from keeping domestic pets in construction camps and/or worksites.
- Workers will be made aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas).
- Workers will be prohibited from feeding wildlife.
- Concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) will be reported to the appropriate state and federal agencies.
- Keystone will prepare and implement a Project-specific Spill Prevention Control and Countermeasures (SPCC) Plan.
- Electrical service providers will implement protection measures to minimize raptor perching in accordance with the Avian Power Line Interaction Committee (APLIC), Suggested Practices for Avian Protection on Power Lines (APLIC 1996, 2012).
- Big Flat Electric Cooperative will provide immediate notification to the USFWS in the unlikely event that a black-footed ferret is sighted during construction of the power line to PS-09.
3.2.1.4. Effects of the Action

Pipeline Construction

There are currently no black-footed ferret populations along the proposed pipeline route (USFWS 2013c). No potentially suitable habitat (i.e., prairie dog towns in Montana) would be affected by the currently proposed route. While some prairie dog towns were identified along the route in South Dakota and Nebraska, these prairie dog towns do not require mitigation measures or additional consultation under the ESA because any black-footed ferrets potentially associated with these prairie dog towns are reintroduced and designated as non-essential experimental populations (AECOM 2008a; USFWS 2008d).

Overall, it is highly unlikely that the proposed Project would have an effect on the black-footed ferret, on federal or non-federal lands, given the lack of known occurrences or potentially suitable habitat within the action area. Potential temporary effects on black-footed ferrets, if they were present, could include disturbance and displacement due to increased noise and human presence during construction, habitat loss and habitat fragmentation due to disturbance of sparsely vegetated habitat in prairie dog towns, and reduced prey availability due to mortality or reduced reproduction of black-tailed prairie dogs. While potentially suitable habitat within the construction corridor would be unavailable during construction activities, disturbed areas would become potentially suitable following final restoration of the ROW and would be available for use by prairie dogs and/or black-footed ferrets. Given the application of the above described conservation measures, effects of proposed-Project construction, if any, would be insignificant and discountable.

Operations

Routine operation of the proposed Project is not expected to affect the black-footed ferret or its habitat. Following construction, maintenance activities (e.g., vegetation management) along the ROW would not preclude the re-establishment of short-grass vegetation within both the temporary and permanent ROW. Normal pipeline operations are highly unlikely to have effects on the black-footed ferret. Potential temporary effects on black-footed ferrets, if present, could include short-term displacement due to exposure to noise, vehicles, and human disturbance during annual ground surveillance or aerial surveillance every two to three weeks; however, such effects are highly unlikely, due to the nocturnal activity of the black-footed ferret, the short duration of the reconnaissance, the lack of known occurrences and the lack of potentially suitable habitat within the action area.

Emergency repairs and other maintenance activities could also result in temporary effects on the black-footed ferret, particularly when such activities involve excavation. Although the frequency, location, and extent of such activities cannot be predicted with certainty, no effects on the black-footed ferret would be expected, as no populations occur within the action area, and no potentially suitable habitat was identified within the action area.

Given that effects on black-footed ferrets are highly unlikely to occur, and based on the species distribution relative to the action area, temporary effects, if any, resulting from the operation of the proposed Project would be insignificant and discountable.

Potential Spills

The likelihood of potential releases from the pipeline during operation is discussed in Appendix C.

Although extremely unlikely to occur, potential effects of a spill to black-footed ferrets could include oiling, leading to loss of insulative capacity of fur and toxicological effects from ingestion of contaminated water or from direct ingestion of oil during grooming. Similar effects on prey species could lead to additional toxicological effects and reduced prey availability.

As stated in Section 3.2.1.2, Potential Presence in Action Area, the proposed Project would not encounter any areas of habitat potentially suitable for essential populations of black-footed ferrets. Therefore, effects on black-footed ferrets resulting from a crude oil spill from the pipeline are highly unlikely due to the low probability of a spill, the extremely low probability of a spill coinciding with the presence of black-footed ferrets, and the extremely low probability of a ferret contacting the spilled crude oil. As such, these effects, if any, would be insignificant and discountable.

Power Infrastructure

Proposed power lines associated with the proposed Project are likely to attract raptors, which are known to be predators of the black-footed ferret and its primary prey, prairie dogs. However, the long-term effects of increased predation, if any, would be insignificant and discountable because (1) none of the proposed power lines, including those subject to the decisions of WAPA and/or RUS, would approach a known population of black-footed ferrets and the USFWS has determined that effects on prairie dogs in Montana, South Dakota, and Nebraska do not affect the black-footed ferret where it is not known to occur (Berglund 2018) and (2) electrical service providers will implement protection measures to minimize raptor perching.

3.2.1.5. Cumulative Effects

The Proposed Federal Decisions have a slight potential to result in temporary effects on the blackfooted ferret within its range in Montana. However, effects, if any, are highly unlikely to occur given the general lack of known occurrences and the lack of potentially suitable habitat within the action area.

Future non-federal projects reasonably certain to occur within the action area that also may disturb individuals and/or convert potentially suitable habitat include non-federal pipelines, power lines, residential and/or commercial development, road development, and oil and gas exploration and development projects, as well as actions that convert natural habitats to agricultural production. These types of projects all have the potential to result in temporary effects on black footed ferrets, their habitat, or habitat of their primary prey, prairie dogs.

Given the lack of known occurrences of black-footed ferrets within the action area, cumulative effects on individuals would not be expected to occur as a result of future non-federal actions. Similarly, considering that the USFWS has determined that effects on prairie dogs in Montana, South Dakota, and Nebraska do not affect the black-footed ferret where it is not known to occur (Berglund 2018), cumulative effects on black-footed ferret habitat within the action area would be highly unlikely.

3.2.1.6. Determination

Effect on the Species

The proposed Project, and therefore, the Proposed Federal Decisions, "<u>may affect, but is not likely</u> <u>to adversely affect</u>" endangered or experimental populations of the black-footed ferret. This determination is based on agency provided information, Keystone's commitment to the conservation measures outlined above, and the general lack of potential for occurrence of wild populations of black-footed ferrets within the action area. No prairie dog towns meeting the criteria for suitable habitat for endangered black-footed ferrets would be crossed or affected by the proposed Project on federal or non-federal lands.

3.2.2. Interior Least Tern—Endangered

3.2.2.1. Natural History and Habitat Association

The interior population of the least tern (previously *Sterna antillarum*, now *Sternula antillarum*) was listed as endangered on May 28, 1985 (Endangered and Threatened Wildlife and Plants; Interior Population of Least Tern to be Endangered, 50 Fed. Reg. 102 [May 28, 1985]). Historically, the breeding range of this population extended from Texas to Montana and from eastern Colorado and New Mexico to southern Indiana. It included the Rio Grande, Red, Missouri, Arkansas, Mississippi, and Ohio river systems. The interior least tern is a migratory bird that winters along the Gulf Coast, the coasts of Caribbean islands, the eastern coast of Central America, and northern South America. The interior least tern continues to breed in most of the historical river systems, although its distribution generally is restricted to less altered river segments (USFWS 1990). No critical habitat has been designated for this population.

Interior least terns spend 4 to 5 months at their breeding sites. They arrive at breeding areas from late April to early June. Nesting areas of interior least terns include sparsely vegetated sand and gravel bars within a wide, unobstructed river channel or salt flats along lake shorelines (Nelson 1998; USFWS 1990). Nesting locations are usually well above the water's edge on dry, elevated sandbars and shorelines. These areas offer the best protection against being flooded during most of the nesting season. The extent of available nesting area depends on water levels and the resulting amount of exposed bar and shoreline habitat. The interior least tern also nests on artificial habitats such as sand and gravel pits next to large river systems and dredge islands (Campbell 2003; USFWS 1990).

Interior least terns are considered colonial nesters; colonies generally consist of up to 20 nests. However, colonies with up to 75 nests have been recorded on the Mississippi River. Most interior least tern nesting areas on the rivers crossed by the proposed Project would be limited to a few nesting pairs. Interior least terns nest on the ground and create a simple, unlined, depressional scrape, typically on sites that are dry, sandy, and relatively free of vegetation. The nesting season for the interior least tern is from April 15 through September 1. Usually two to three eggs are laid by late May (USFWS 1990) or early June. Both the male and female share incubation duty, which generally lasts from 20 to 25 days. Fledging occurs within 3 weeks after hatching. Departure from colonies varies but is usually complete by early September (USFWS 1990).

Interior least terns predominantly eat fish, feeding on minnows they catch in shallow waters of rivers, streams, and lakes. On the Great Plains, fish are the primary diet of this species (Nelson 1998; USFWS 1990). Although terns nesting at sand and gravel pits or other artificial habitats may travel up to 2 miles to forage (USFWS 1990), terns usually feed close to their nesting sites. Feeding behavior involves hovering and diving over standing or flowing water to catch small fish.

Alteration and destruction of riverine habitats, primarily as a result of changes in channel characteristics due to channelization, irrigation, and construction of reservoirs and pools, are threats to the long-term survival of this species. These types of disturbances may eliminate nesting sites, disrupt nesting interior least terns, or may result in sandbars that are unsuitable for nesting due to vegetation encroachment or frequent inundation. The regulation of river flow regimes using dams may also eliminate nesting sites or disrupt nesting interior least terns. Historically, summer flow periods were fairly predictable and consisted of a high flow in May and June and a decline in flow for the remainder of the summer. This decline in flow levels allowed interior least terns to nest as water levels dropped and sandbars became available. The current human regulation of river flow regimes using dams may result in high-flow periods extending into the normal nesting period or occurring after nesting has begun, thus flooding active nest sites (USFWS 1990).

3.2.2.2. Potential Presence in Action Area

The proposed Project would cross six rivers that could contain potentially suitable nesting habitat for the interior least tern (least tern): the Missouri and Yellowstone rivers in Montana; the Cheyenne River in South Dakota; and the Niobrara, Elkhorn, and Platte rivers in Nebraska. None of the proposed pipeline crossings at these rivers occur on BLM-managed lands, WAPA-owned lands, or other lands involved in the decisions of WAPA or RUS; however, the proposed pipeline crossing of the Missouri River would occur on lands managed by the USACE at the Fort Peck project, and several pipeline crossings are expected to require USACE PCNs under Nationwide Permit 12 pursuant to Section 404 of the Clean Water Act. The proposed power infrastructure to PS-9 and PS-10 overlaps BLM-managed lands, WAPA-owned lands, and lands owned and managed by the USACE, and also involves WAPA interconnection decisions. The remaining power lines subject to WAPA and/or RUS decisions in Montana and South Dakota do not cross these rivers. An assessment of the potential occurrence of least terns at these identified river crossings is provided below. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, where available, was also used to determine the extent of potential habitat near the proposed Project.

In 2008, 2011, 2012, 2013, and 2019, surveys for potentially suitable nesting habitat and occurrences of interior least tern were conducted at the crossings of the Missouri and Yellowstone rivers in Montana, the Cheyenne River in South Dakota, and the Platte and Niobrara rivers in Nebraska (Table 3.2-1 below, and Appendix G, Interior Least Tern and Piping Plover 2013 Survey). In addition to the surveys described above, the USFWS Nebraska Field Office conducted surveys for interior least terns within suitable habitat in the Middle Loup, Loup, Elkhorn, and Lower Platte rivers in Nebraska. The USFWS surveys of the Elkhorn and Lower Platte rivers overlap the proposed pipeline crossings.

While the following assessment of potential least tern presence within the action area focuses on potentially suitable nesting habitat, some potential exists for migrating least terns to encounter proposed-Project activities during the fall and spring migration. Generally, fall migrants follow major river drainages east to the Mississippi River, which they then follow south to the Gulf of Mexico; however, there is limited evidence that some individuals migrate cross-country (Thompson et al. 1997; USFWS 2013b). Migrants travel in small groups, feeding in the shallows and resting onshore. As such, individuals that nest upstream of the action area may traverse the action area during migration.

State	County	Survey Location	Survey Date	Survey Results	Comments
Montana	Valley / McCone	Missouri River	June 3 and July 11, 2011; June 11, 2013; July 3, 2019	No interior least terns observed at river crossing.	Poor bank and no island nesting habitat, suitable foraging habitat.
Montana	Dawson	Yellowstone River	June 3 and July 11, 2011; June 13, 2013; July 2, 2019	No interior least terns observed at river crossing.	Suitable nesting habitat was not observed but could be present in other years depending on river flows. Suitable foraging habitat was noted.
South Dakota	Meade / Pennington / Haakon	Cheyenne River	July 23, 2008; June 6, 2011; June 18 and 19, 2013; July 1, 2019	No interior least terns observed at river crossing.	Good bank and potential island nesting habitat depending on river flows, suitable foraging habitat at crossing location.
Nebraska	Keya Paha / Rock	Niobrara River	July 22, 2008; July 7, 2011; June 22 - 26, 2012 ^a	Four interior least terns observed in 2012.	Good bank and island nesting habitat, suitable foraging habitat at crossing location.
Nebraska	Merrick / Hamilton	Platte River ^b	July 22, 2008; July 6-7, 2011; July 15-20, 2012; June 25, 2013	No interior least terns observed at river crossing	Suitable nesting habitat was not observed but could be present in other years depending on river flows.
Nebraska	Butler /Colfax	Platte River [°]	June 15, 2011; August 8, 2011; June 25, 2019 [°]	No interior least terns observed on June 152011. Four adults on August 8, 2011. No interior least terns observed in 2019.	Four adults observed on sandbars in August 2011. Crossing has been extensively altered by large-scale flooding (per 2019 survey).
Nebraska	Antelope / Pierce	Elkhorn River	June 14, 2011 July 27, 2011	Ten adults and 5 nests on July 14. Four adults and 1 nest on July 27.	These colonies were located on point bars approximately 2.4 and 3.5 river miles downstream of the proposed crossing.

Table 3.2-1Occurrence Surveys for the Interior Least Tern within 0.25 Mile of the
Proposed Project Route in 2008, 2011, 2012, 2013, and 2019

MAR = Mainline Alternative Route; USFWS = U.S. Fish and Wildlife Service

^a Surveys of the Niobrara River were conducted before the route was changed to reflect the MAR, at approximately 15 miles west of the currently proposed site. It is likely that similar conditions occur at the current crossing.

Montana

Missouri River

The proposed pipeline would cross the Missouri River via horizontal directional drilling (HDD) approximately 1.1 river miles below the point where the Fort Peck spillway enters the Missouri River, and approximately 9.2 river miles below Fort Peck dam proper. Surveys for nesting least tern were completed at the proposed crossing on June 3 and July 11, 2011, on June 11, 2013, and on July 3, 2019. All surveys determined that potentially suitable nesting habitat at the crossing was unlikely to occur, due to regulated flows from Fort Peck Dam and the lack of sparsely vegetated sand and gravel bars that are the preferred nesting substrate for the least tern (Thompson et al. 1997). In particular, the 2013 survey noted that, "Suitable habitat is unlikely at the Missouri River crossing based on the densely vegetated emergent mud bars present at the crossing, and more consistent flow levels due to dam-controlled water releases immediately upstream of the crossing. This consistent water flow likely precludes the exposure of sand or gravel bars during the breeding season. No interior least terns, piping plovers, or other shorebirds or wading birds, other than 1 killdeer, were observed...over several hours of survey" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

Consistent with the survey observations, a review of aerial imagery between 2006 and 2018 at the pipeline crossing site indicates a general lack of vegetation-free sand bars within 0.25 mile of the river crossing. Mud flats are inconsistently exposed at the crossing from year to year and appear to be quickly vegetated with emergent vegetation similar to what was observed in 2011 and 2013. Photos of the crossing site from 2013 and 2017 showed small, vegetated mud flats at the crossing.

An MNHP query identified 16 historic least tern occurrences, including transitory observations as well as nesting pairs and chicks within 5 miles of the proposed pipeline crossing and the current alignment of the power line associated with PS-10 (MNHP 2019). These observations were recorded between 1989 and 2017 (MNHP 2019). Two of the occurrences were from 1996 and were documented at river mile 1759. The remaining occurrences were documented along Fort Peck Lake. Eight occurrences were observed along Bear Creek Bay in Fort Peck Lake from 1989 to 2007; these records noted evidence of breeding and/or young. Three other occurrences were documented in the northwest portion of Fort Peck Lake, all of which showed evidence of breeding. Further, two least tern observations during the nesting season have been recorded approximately 3 miles west of Fort Peck Dam, two in 1987 and one in 2009. These observations were of a pair of terns, and it is assumed these observations represent breeding birds (eBird 2018). There are no observations of nesting least terns closer to this proposed pipeline crossing or the proposed power line to PS-10, likely because suitable nesting habitat is lacking.

Potential nesting habitat within 0.25 mile of the proposed pipeline crossing is poor and frequently lacking, due to consistent water levels and limited nesting substrate that is quickly vegetated with

^b Surveys of the Platte River were conducted before the route was changed to reflect the MAR, at approximately 41 miles west of the currently proposed site. See document text for details.

^c The current Platte River crossing as presented in this document was surveyed by the USFWS in 2011 and by Keystone in 2019.

dense, emergent vegetation. It is unlikely that nesting least tern would be present within 0.25 mile of the proposed pipeline crossing at the Missouri River, due to the lack of suitable nesting habitat.

Habitat at the proposed power line to PS-10 consists of the Fort Peck Dam face and a small residential area. Only a small portion of the proposed power line would fall within 1 mile of the habitat. Potentially suitable nesting habitat within 0.25 mile of the proposed power line to PS-10 is entirely lacking. The only water and shoreline habitat within 0.25 mile of the proposed power line is that immediately below Fort Peck Dam, which consists of a steep, riprap shoreline or small farm ponds further north along the route. It is unlikely that nesting least tern would be present within 0.25 mile of the proposed power line at Fort Peck Dam due to lack of suitable nesting habitat.

Yellowstone River

The proposed pipeline would cross the Yellowstone River via HDD approximately 7.9 river miles below the I-94 bridge crossing near Fallon, Montana. Surveys for nesting least tern were completed at the proposed crossing on June 3 and July 11, 2011, on June 13, 2013, and on July 2, 2019. Although potentially suitable nesting habitat was not present during these surveys, the survey efforts noted that suitable nesting habitat at the crossing was possible if water levels were lower. In particular, the 2013 survey noted that, "no suitable nesting habitat for interior least tern …was present. The south bank is a steep cut bank with no gravel or sand bars present. The north bank was comprised of a series of low, well-vegetated terraces and a wide mud flat at water's edge. The mud flat was moderately vegetated, with a mix of herbaceous and woody species (cottonwood and tamarisk seedlings and saplings), but it appears too densely vegetated to be suitable interior least tern…habitat. No individual [least terns] were observed, nor were other wading birds or shorebirds. Suitable habitat may be present during the breeding season in years when water levels are lower or later in the summer" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

A review of aerial imagery between 2006 and 2018 at the river crossing site indicates that bare sand or gravel bars are often present within 0.25 mile of the HDD crossing after spring runoff, when high water has receded. These bars are between 0.22 and 0.35 miles from the HDD entry and exit point, respectively, depending on the time of year and water levels. Much more extensive bare sand or gravel bars exist downstream of the proposed crossing, between 1.5 and 13 river miles away. A photo of the crossing site from 2013 showed vegetated sand bars on the north side of the river (primarily the noxious weed leafy spurge [*Euphorbia esula*]), and steep cut banks on the south side of the river (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

According to past inquiries with the USFWS Billings Ecological Services Field Office (AECOM 2008c) and the MFWP (AECOM 2009d), the Yellowstone River crossing in Dawson County, Montana, has historically supported breeding populations of interior least terns. An updated MNHP query in 2019 identified 34 least tern observations from 1991 to 2014. Twenty-five of these observations indicated evidence of breeding. All of these occurrences were documented within 5 miles of the proposed pipeline crossing and/or the proposed power line to PS-13 (MNHP 2019).

In addition, eBird checklist data identify an active nest on an unnamed island approximately 5 river miles downstream of the proposed pipeline crossing (Bacon 2013).

The presence of potentially suitable nesting habitat for least tern within 0.25 mile of the proposed pipeline crossing is possible, depending on water levels. It is possible that nesting least tern could be present within 0.25 mile of the proposed pipeline crossing at the Yellowstone River if suitable nesting habitat is present, as there are several records of nesting least tern in the vicinity. However, it is more likely that nesting least tern would be present between 1.5 and 13 miles downstream of the proposed Yellowstone River crossing, where suitable habitat and records of nesting least tern are both more common.

Milk River

The Milk River would be crossed by the proposed pipeline and by two proposed power lines serving PS-09 and PS-10. However, these areas are unlikely to harbor interior least tern because potentially suitable habitat is generally lacking. Additionally, the characteristics of the river and sandbars at the proposed crossings are not conducive to use by interior least terns. The only occurrence of least terns on the Milk River was documented in 1989 near the confluence with the Missouri River. No indication of breeding was documented.

The proposed power line to PS-09 would cross the Milk River at a point at where the river is approximately 90 feet wide, considerably smaller than the river width preferred by the least tern (greater than 600 feet; Lott et al. 2013). Additionally, a review of aerial imagery from 1996, 2004, 2005, 2006, 2009, 2011, and 2014 did not reveal the presence of any sparsely vegetated sand bars within 0.5 mile of the proposed power line crossing.

The proposed power line to PS-10 would cross the Milk River three times within a meandering 0.8-river-mile stretch of river. The river width along this stretch is approximately 115 feet, considerably smaller than the river width preferred by the least tern. Additionally, a review of aerial imagery from 1996, 2004, 2005, 2006, 2009, 2011, and 2012 did not reveal the presence of any sparsely vegetated sand bars within 0.5 mile of the proposed power line crossings.

The proposed pipeline would also cross the Milk River at a point at which the river is approximately 115 to 200 feet wide. Although a review of aerial imagery revealed the occasional presence of sparsely vegetated sand bars nearby, the largest of the bars is less than 2 acres, well under the preferred size of 20 to 80 acres (Schwalbach et al. 1988, as cited in USFWS 1990).

South Dakota

Cheyenne River

During a meeting with Keystone representatives on June 10, 2008, SDGFP indicated that the Cheyenne River pipeline crossing on the border of Meade, Pennington, and Haakon counties has historically supported, or currently supports, breeding populations of interior least terns (AECOM 2008e). No proposed power lines cross the Cheyenne River.

The proposed pipeline would cross the Cheyenne River via HDD approximately 5.6 river miles upstream of the SR-34 bridge crossing south of Howes, South Dakota. Surveys for nesting least

tern were completed at the proposed crossing on July 23, 2008; June 6, 2011; June 18 and 19, 2013; and July 1, 2019. All surveys noted that potentially suitable nesting habitat was present, although no least terns were observed. The 2013 survey stated, "Suitable interior least tern…habitat was present on sand/gravels bars within the braided stream channel, primarily on the large sand/gravel bar closest to the north bank. The sand/gravel bars in the middle and south portion of the main channel were less suitable nesting habitat due to denser vegetation. No individual [interior least terns] were observed, although other shorebirds (spotted sandpiper and killdeer) were observed on the northernmost sand/gravel bar" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

Aerial imagery between 2006 and 2018 at the proposed Cheyenne River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff, when high water has receded. These sand bars are approximately 0.25 mile from the HDD entry point and approximately 0.17 mile from the HDD exit point, depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles. A photo of the crossing site from 2013 showed sparsely vegetated sand and gravel bars.

The South Dakota Natural Heritage Program (SDNHP) identified seven least tern occurrences within 5 miles of the proposed pipeline crossing in Haakon and Ziebach counties. There were also three documented occurrences in Meade County. These occurrences were recorded between 1986 and 1996 and included evidence of breeding. Each documented occurrence represented multiple individuals (SDNHP 2019). One nest site with five to seven adults was identified in 1986 approximately 1 mile west of the proposed crossing. A second nest site with five adults was identified in 2012 approximately 0.4 mile east of the proposed crossing. Both nest sites were on large, exposed sand and gravel beaches. The closest least tern occurrence listed in the eBird database is approximately 47 miles southeast near Midland, South Dakota (Stolz and Parkin 2016), but the most common records occur on Lake Oahe between 43 and 75 miles to the east of the proposed crossing (Miller 2018).

Potentially suitable nesting habitat for the least tern is typically present at the proposed Cheyenne River HDD crossing. Depending on the time of year and water levels, potentially suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting least terns could be present within 0.25 mile of the proposed pipeline crossing at the Cheyenne River as potentially suitable nesting habitat is often present and there are records of nesting least tern in the immediate area.

Little Missouri River

The proposed power line to PS-15 would cross the Little Missouri River at a point at which the river is approximately 170 feet wide, which is significantly narrower than preferred by least terns. A review of aerial imagery from 2003, 2004, 2005, 2006, 2010, and 2014 revealed frequent occurrence of sparsely vegetated sand bars and islands in the vicinity of the proposed crossing. However, the largest of the bars is less than 2.5 acres, well under the preferred size of 20 to 80 acres

(Schwalbach et al. 1988, as cited in USFWS 1990). Given the characteristics of the river at the proposed crossing, the interior least tern is unlikely to occur.

White River

The proposed pipeline would cross the White River at a point at which the river is approximately 320 feet wide. A review of aerial imagery from 1991, 2004, 2005, 2006, 2010, 2011, 2014, and 2017 revealed frequent occurrence of sparsely vegetated sand bars and islands within 0.25 mile of the proposed crossing. However, the largest of the bars was less than 9 acres, somewhat under the preferred size of 20 to 80 acres (Schwalbach et al. 1988, as cited in USFWS 1990).

SDNHP reports eight occurrences of least tern observations in Pennington County between 1986 and 2012 within 5 miles of the proposed pipeline crossing. Each occurrence represented multiple birds and evidence of nesting (SDNHP 2019).

Potentially suitable nesting habitat for least terns may be present at the proposed White River crossing. Depending on the time of year and water levels, potentially suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting least terns could be present within 0.25 mile of the proposed pipeline crossing at the White River, as potentially suitable nesting habitat is often present, although there are no records of nesting least tern in the immediate area.

Nebraska

The distribution of interior least terns along the proposed-Project route in Nebraska includes the Niobrara, Elkhorn, and Platte rivers (AECOM 2008d; exp Energy Services 2018; USFWS 2011a). In addition to breeding on riverine sandbars and at sand and gravel mining operations and foraging in rivers and associated wetlands, interior least terns migrate through the Great Plains during both spring and fall.

The proposed Project route in Nebraska does not encounter any lands involved in the Proposed Federal Decisions, except possibly the decisions of the USACE. The USACE may issue verifications in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS.

Niobrara River

The proposed pipeline crossing of the Niobrara River on the border of Keya Paha and Rock counties contains sandbars suitable as nesting habitat and continues to support breeding interior least terns. The proposed pipeline would cross the Niobrara River via HDD approximately 1.6 river miles upstream of the 469th Avenue bridge crossing south of Naper, Nebraska. Surveys for nesting least tern have not been completed at this site due to lack of access. Surveys for nesting least tern were completed at the previous Niobrara River crossing approximately 10 miles west of the currently proposed site. Those previous surveys were completed July 22, 2008; July 7, 2011; and June 22 to 26, 2012. Four least tern were observed at the previous crossing site in 2012. The

2013 survey report stated, "NOT SURVEYED IN 2013—NO ACCESS. The 2012 survey noted excellent potentially suitable least tern habitat on numerous sand bars and recorded 4 interior least terns. Although the 2012 survey was at a proposed river crossing that is upstream of the current crossing, it is likely that similar conditions occur at the current crossing" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

Aerial imagery between 2006 and 2018 at the proposed Niobrara River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the pipeline HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.10 mile from the HDD entry point and approximately 0.23 mile from the HDD exit point depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

The Nebraska Natural Heritage Program (NNHP) lists 12 least tern observations within 5 miles of the proposed Niobrara River crossing (NNHP 2019). The closest eBird records of least tern occur at Spencer Dam Wildlife Management Area approximately 30 miles east of the proposed crossing. Numerous eBird records of least tern occur on the Missouri River between 30 and 60 miles east of the proposed pipeline crossing of the Niobrara River (eBird 2018).

Potentially suitable nesting habitat for least tern is often present at the proposed Niobrara River HDD crossing, depending on water levels and the arrangement of bare sand bars, both of which fluctuate annually. Depending on the time of year and water levels, suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting least tern could be present within 0.25 mile of the proposed pipeline crossing at the Niobrara River, as suitable nesting habitat is typically present, least tern were observed during the nesting season at the previous Niobrara River crossing, and the species has been observed near the currently proposed crossing as well as further east in similar habitat.

Elkhorn River

The MAR portion of the pipeline would cross the Elkhorn River near the border of Antelope and Madison counties. The proposed pipeline would cross the Elkhorn River via HDD approximately 0.2 river mile upstream of the 534th Avenue bridge crossing north of Tildon, Nebraska. Surveys for interior least terns were conducted in June and July 2011. Large expanses of high, dry point bars measuring between 10 and 21 acres were observed during surveys in 2011. A total of fourteen least terns and five active nests were observed during the survey. The two documented colonies were located approximately 2.4 and 3.5 river miles downstream of the proposed crossing. Additionally, the NNHP lists five least tern observations within 5 miles of the proposed Elkhorn River crossing (NNHP 2019).

Aerial imagery between 2006 and 2018 at the proposed Niobrara River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.10 mile from the HDD entry point and approximately 0.23 mile from the HDD exit point depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

Potentially suitable nesting habitat for least tern is often present in the vicinity of the proposed Elkhorn River HDD crossing depending on water levels and the arrangement of bare sand bars, both of which fluctuate annually. Depending on the time of year and water levels, potentially suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting least tern could be present within 0.25 mile of the proposed pipeline crossing at the Elkhorn River, as suitable nesting habitat is typically present and least terns were observed during the nesting season in the vicinity of the proposed crossing as well as further east in similar habitat.

Platte River

The MAR would cross the Platte River at the border of Colfax and Butler counties, where sandbars and sand/gravel pits associated with this segment of the river support interior least tern during breeding and foraging. The proposed pipeline would cross the Platte River via HDD approximately 9.4 river miles downstream of the Highway 81 bridge crossing south of Columbus, Nebraska. Surveys for nesting least tern have not been completed at this site. Surveys for nesting least tern were completed at the previous Platte River crossing approximately 41 miles west of the currently proposed site. Those previous surveys were completed July 22, 2008; July 6 and 7, 2011; July 15 to 20, 2012; and June 25, 2013. Least tern were not observed during any survey period on the Platte River. Habitat at the previous crossing was variable, as the 2013 survey states, "sand bars and banks along the middle channel (MP 775.2)⁴ and the south (main) channel (MP 775.4) were not suitable interior least tern or piping plover habitat because they were recently exposed and saturated to the surface; however, these areas, particularly the south channel, would likely have suitable habitat during breeding season in years when water levels are lower. No individuals [least terns] were observed, nor were other wading birds or shorebirds. No suitable habitat is present on the northernmost channel (MP 775.05), which is a heavily vegetated, inactive channel" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey). Habitat at the current crossing has been observed in May 2018 during wetland surveys, but water levels were high and all potential nesting sites were inundated.

Aerial imagery between 2006 and 2018 at the proposed Platte River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.26 mile from the HDD entry point and approximately 0.40 mile from the HDD exit point depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

The NNHP lists 19 least tern observations within 5 miles of the proposed Platte River crossing (NNHP 2019). Least terns were observed during the nesting season in 2017 approximately 1 mile west of the proposed Platte River crossing (Jorgensen 2017). Four other records occur between 4 and 7 miles of the proposed crossing from 2000 and 2017.

⁴ The mileposts quoted in the 2013 survey report are no longer applicable to the proposed Project due to route changes that have occurred since that time.

Suitable nesting habitat for the least tern is often present at the proposed Platte River HDD crossing, depending on water levels and the arrangement of bare sand bars, both of which fluctuate annually. Suitable nesting habitat would likely not be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting least tern could be present within 0.25 mile of the proposed pipeline crossing at the Platte River, as suitable nesting habitat is often present and the species has been observed in the general area.

West Fork Big Blue River

The only power line necessary to power the proposed Project that would cross a river in Nebraska is the line to PS-25, which would cross the West Fork Big Blue River at an existing road crossing. At this location, the stream is approximately 70 feet wide and is devoid of suitable habitat for the interior least tern. This species is not known to use this waterbody and is unlikely to be found at this location.

3.2.2.3. Conservation Measures

Keystone, or electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the interior least tern and potentially suitable habitat for the species.

- Crossings of major rivers and riverine habitat will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season.
- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Where practicable, vegetative screening at HDD sites will be maintained to prevent disturbance of interior least terns.
- Should HDD activities occur at night, lights will be down-shielded when the site is within 0.25 mile of potentially suitable habitat and vegetative screening is lacking.
- Pre-construction presence/probable absence surveys of pipeline crossings will occur within 0.25 mile of potentially suitable breeding habitat at the Platte, Elkhorn, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone River in Montana during the interior least tern nesting season (April 15 to September 1) to ensure that there are no nesting pairs within 0.25 mile of the construction area. If interior least tern nests are found at the crossings, Keystone will: (1) adhere to a 0.25-mile buffer of no pipeline construction activity and (2) continue to monitor nests if any are within 0.25 mile of the construction footprint until young have fledged.
- Daily surveys for nesting terns will be conducted during the nesting season when construction activities occur within 0.25 mile of potential nesting habitat.
- If nesting terns are present, Keystone will make minor adjustments to the pipeline corridor, if practicable, to avoid nesting interior least terns, in coordination with USFWS. This may

involve shifting the pipeline corridor away from nests to avoid disturbances to interior least tern nests or other modifications depending on the circumstances.

- To the extent practicable, construction will occur mostly during daytime hours and will comply with any local noise regulations.
- Construction equipment will be properly equipped with mufflers to lessen noise impacts.
- Keystone will prepare and implement a project-specific SPCC Plan.
- Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge, which is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment; a spill kit will be onsite.
- Refueling and lubrication of construction equipment will occur in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.
- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible.
- Equipment will not be washed in streams or wetlands.
- Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials.
- Water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow.
- Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30-day period except where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.
- During aerial surveillance, aircraft will maintain at least 1,000 feet of elevation.
- If construction of power lines occurs during the interior least tern nesting season, surveys of potentially suitable riverine and/or sand pit nesting habitat within 0.25 mile of new power lines will be conducted within 2 weeks of construction to determine presence of nesting pairs. If nesting interior least terns are present, construction will cease until chicks fledge from the site.

• Power providers will install anti-perching measures on all structures within 0.1 mile of either side of the proposed crossings of the Platte, Elkhorn, Niobrara, Cheyenne, Yellowstone, Milk and Missouri rivers.

3.2.2.4. Effects of the Action

Pipeline Construction

The use of the HDD crossing method is intended to avoid effects on interior least terns or their habitat during pipeline construction.

The primary construction-related temporary effects would be disturbance and potential exposure to small fuel spills and leaks from construction machinery, if they were to occur. The effect of construction-related spills within interior least tern habitat would be minimal because all hazardous materials such as fuels and oils would be stored at least 100 feet away from surface waters, and these types of spills or leaks generally are small in volume and are cleaned up quickly. According to Keystone's Construction, Mitigation, and Reclamation Plan (CMRP; Appendix B), hazardous materials, chemicals, fuels, and lubricating oils would not be stored, staged, or transferred (other than possible refueling) within 100 feet of any waterbody, wetland, storm drain, drop inlet, or high consequence area.

The interior least tern is known to nest within or near the proposed Project at the Niobrara, Elkhorn, and Platte rivers in Nebraska, the Cheyenne River in South Dakota, and the Yellowstone River in Montana. No effects on interior least tern nesting and/or foraging habitat would be anticipated at these locations, since pipeline placement across the rivers would be completed by HDD. Limited human access would be required within the riparian areas of these rivers in order to use the Tru-Tracker® cable that is associated with the drilling equipment and in order for equipment to access these rivers to potentially withdraw water for HDD and hydrostatic tests for the proposed Project. No effects are anticipated because construction activities, including HDD activities, would cease if interior least terns are identified during daily pre-construction surveys. Drilling equipment pads and staging areas for HDD would have required set-backs from the riparian zone in each river and would be determined during the federal, state, and local permitting processes. Setbacks can vary from 50 to 100 feet, depending on the river and local jurisdictions.

Temporary effects could result from increased noise and human presence at work site locations if nesting interior least terns are located within 0.25 mile of the proposed Project and may lead to reduced reproductive success or mortality to eggs, chicks, or adults (USFWS 1990, USFWS 2012). Just prior to beginning construction-related activities within 0.25 mile from nesting interior least terns, Keystone will conduct presence/absence surveys to identify active colony and nest sites, in coordination with the USFWS. If active colonies and nest sites are identified, the USFWS will be notified and appropriate protection measures implemented on a sites-specific basis in coordination with the USFWS. These protection measures may include temporarily delaying work until young have fledged the nest or making modifications to the pipeline corridor, if possible. Situations in which delaying work may be impossible could include the withdrawal of water from a major river for hydrostatic testing of the pipeline to comply with permit restrictions on season of withdrawal, or commencement of an HDD installation to ensure that work is completed prior to the end of the

construction season. Should nighttime HDD work occur, lights would be down-shielded to help avoid disruption of behavior. If least terns are documented within the construction corridor, conservation measures (outlined above) would ensure minimal effects on either nesting adults or fledglings.

Temporary withdrawals of water (e.g., for hydrostatic pipeline testing) have some potential for effects on potentially suitable nesting and foraging habitat for this species. However, implementation of conservation measures as outlined in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS would help minimize effects, and these effects, if any, will be insignificant and discountable. Specifically, only the volume of water needed will be withdrawn, withdrawals will be limited to less than 10 percent of daily base flow, and the water will be returned back to its source at the conclusion of hydrostatic testing. Furthermore, temporary effects on downstream water quality would also be avoided by the measures described in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS.

While migrating interior least terns may encounter construction activities during spring and fall migration, temporary effects, if any, are expected to be insignificant and discountable as migrating individuals would either be flying over during migration, or utilize areas of the rivers upstream or downstream of construction areas as stopover sites.

Operations

Similar constraints and/or mitigation measures mentioned above may apply to any pipeline maintenance activities.

Aerial surveillance would be conducted 26 times per year at intervals no greater than once every 3 weeks; the aircraft passes an area quickly at an altitude of about 1,000 feet. Surveillance flights at this altitude are unlikely to disturb nesting interior least terns. Additionally, annual ground-based surveillance is unlikely to disturb nesting least terns as all potentially suitable least tern nesting habitat will be avoided through the use of HDD, and the pipeline would be 25 feet below the river bottom in potentially occupied habitat.

Emergency repairs and other maintenance activities are not likely to result in temporary effects on the interior least tern. Although the frequency, location, and extent of such activities cannot be predicted with certainty, no effects on interior least terns or their habitat would be expected as major river crossings are subject to an intensive integrity management program stipulated by the U.S. Department of Transportation (USDOT) (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for HDD crossings. Should emergency repairs be required at major river crossings, HDD methods would be used and potentially suitable habitat for interior least terns would be avoided.

According to Keystone's Pipeline Temperature Effects Study (Appendix E), the proposed pipeline would have some long-term effect on surrounding soil temperatures, primarily at pipeline depth. There is limited information on the effects of pipeline temperatures in relation to surface water and wildlife. Because the pipeline is buried greater than 25 feet below the river bottom using the HDD method, temperature dissipation effects would be negligible.

Potential Spills

The likelihood of a spill occurring within the known range of the interior least tern is shown in Table 3.2-2. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Habitat surveys have been completed along the entire pipeline ROW, and in some cases extended beyond the ROW to a total width of 300 feet; these found that suitable habitat for listed species was absent from the survey corridor within much of the species' known ranges. Therefore, the likelihood of spills occurring within suitable habitat for this species would be lower than that listed in Table 3.2 -2. Appendix C includes additional information on the pipeline incident analysis and the potential extent of spills of various sizes.

Table 3.2-2	Likelihood of Spills	Occurring within	the Range of the Interior	Least Tern
-------------	----------------------	------------------	---------------------------	------------

Resource (Species Range)		Medium Spills per		Estimated Years Between Spills within
	Small Spills per Year	Year	Large Spills per Year	Species Range
Interior least tern	0.2	0.04	0.006	5.0

Any major river that could contain potentially suitable interior least tern habitat at the planned crossing or downstream would be crossed using HDD methods that would result in a burial depth of 25 feet or more below the river bottom. In the event of a release, the crude oil would need to penetrate at least 25 feet of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and the potential for exposure. Additionally, as stated above, these major river crossings are subject to an intensive integrity management program stipulated by the USDOT and require heavier wall pipe be used for the HDD method. As a result, it is highly unlikely that a release from the pipeline would occur coincident with these locations. Outside of HDD locations, the pipe would be standard thickness pipe and would be buried to the usual minimum depth (see Appendix C). Considering that proposed HDD entry and exit points are all more than 300 feet from major rivers and that a small spill is expected to spread radially no more than 150 feet (see Appendix C), only a medium spill or larger would likely spread far enough to reach a major river; the likelihood of such a spill reaching a major river is estimated at approximately 0.004 times per year.

Spills or leaks may occur at or near crossings of tributaries, potentially leading to oil being transported downstream. However, contamination in small, low-flow waterbodies would generally occur at the point of the release because of the inability of the waterbody to transport and dilute the contaminants. Therefore, oil is not likely to reach nesting or foraging habitat. Furthermore, oil in a river that contains potentially suitable least tern nesting habitat is unlikely to physically contact any nesting habitat, because nesting habitat is limited to high-elevation sand bars that remain above the water level for the entire nesting season (Lott et al. 2013, USACE 2011).

If a significant release were to occur, federal and state laws would require cleanup. If the pipeline were transporting dilbit (diluted bitumen) at the time of a release to a river, cleanup may require specialized methods, possibly including dredging, based on the tendency of dilbit to sink in water. Submerged dilbit could result in a persistent source of contamination because of the slow rate of natural degradation of this material. Thus, submerged dilbit could result in the slow release of

dissolved hydrocarbons, resulting in long-term effects on organisms. Removal of submerged product from the water column can be a difficult and long process, as observed in the response and cleanup efforts related to the July 2010 release in Marshall, Michigan, to the Kalamazoo River. Cleanup efforts to remove the submerged oil from that river, including dredging, excavation, and aeration, continued for 4 years after the spill (Parker 2014). Lighter or less viscous oils may spread more rapidly than dilbit, but may be more amenable to recovery and natural degradation.

Direct contact with a crude oil spill could result in effects on interior least terns due to oiling of plumage; crude oil ingestion from contaminated plumage or water; bioaccumulation of certain components of the spilled product entering terns via ingested prey; and crude oil transfer to eggs and young, possibly resulting in mortality, reduced hatching success, deformities, or developmental delays. While these exposure routes have the potential to cause effects on individual interior least terns, these effects are highly unlikely, due to the low probability of a spill contacting suitable habitat.

Power Infrastructure

The only power line route within 1 mile of known suitable nesting habitat is the portion of the route for the line that would cross Fort Peck Dam to serve PS-10. However, potentially suitable nesting habitat within 0.25 mile of the proposed power line to PS-10 is absent. This power line would cross the Fort Peck Dam and would be installed on existing power line structures. Similarly, power line crossings of the Milk River would also occur in areas where suitable nesting habitat is lacking. Given the lack of nesting habitat suitability, there would be little to no risk of any effects to nesting least terns. While interior least terns typically forage near riverine nesting areas, effects to foraging habitat are possible, as the species has been documented traveling up to 7 miles from non-riverine nesting areas to forage (USFWS 2013b). However, given that interior least terns utilize a variety of shallow water habitats for foraging, typically in proximity to riverine nesting areas, effects to foraging individuals are not likely to occur.

Power distribution lines required to power the pump stations in Nebraska would not cross major rivers or other areas of habitat suitable for the interior least tern.

Operation of the proposed power lines has the potential to increase the collision hazards for feeding and nesting interior least terns, if present in the action area, potentially resulting in injury or mortality to individuals. The proposed power line in Montana to PS-10 would pass near, but not intersect, potentially suitable habitat. However, since the power line for PS-10 would be strung on existing structures or would replace existing structures with new structures, the increased risk would be insignificant, as birds are likely accustomed or habituated to the existing structures and power lines on the landscape. All other proposed power lines would be located more than 1 mile away from potentially suitable habitat. In addition, the marking of power lines designed to reduce effects to the whooping crane (described in Section 3.2.3.2) would provide incidental benefits to least terns by further reducing the risk of collisions.

Some potential for increased predation on interior least terns exists due to the increased raptor perching opportunities provided by new Project power lines. While this could result in locally high levels of mortality to interior least tern colonies in the vicinity, if present, the exponential growth

of the interior least tern population since the species was listed indicates that locally high levels of predation are not currently a threat to the species' continued survival (USFWS 2012). As described above, only the power line to PS-10 is located within 1 mile of potentially suitable interior least tern nesting habitat. Further, nesting habitat is absent within 0.25 mile of the power line crossing, likely precluding successful predation of nesting terns, if present, by raptors perched on the new power line (Wuczyński 2005).

Overall, with implementation of conservation measures (Section 3.2.2.3) and the incidental benefits of conservation measures designed for the whooping crane, it is expected that the proposed power infrastructure, including that owned by or involving WAPA, financed by RUS, or crossing BLM or USACE lands would have only insignificant and discountable effects on the interior least tern, if any.

3.2.2.5. Cumulative Effects

The Proposed Federal Decisions have the potential to affect the interior least tern within its range in Nebraska, South Dakota, and Montana. Individual terns could be disturbed by construction activities during the nesting season along potentially suitable habitat at major river crossings in the action area. Additionally, individuals may be disturbed during spring and fall migration. However, such effects are not expected considering the conservation measures described above, including the use of HDD at major river crossings and pre-construction surveys for least terns during the nesting season. The proposed power lines associated with the proposed Project also have the potential to affect migrating least terns throughout the life of the proposed Project. These effects, if any, are unlikely to occur as none of the proposed power lines cross major rivers providing potentially suitable habitat for least terns.

Future non-federal projects reasonably certain to occur within the action area that also may disturb individuals and/or convert potentially suitable riverine habitat include pipeline, power line, and road development, as well as actions that affect aquatic habitat including projects that require significant groundwater withdrawals, gravel removal, and conversion of natural habitats to livestock grazing in/near major rivers. These types of projects all have the potential to result in effects on interior least terns and/or their habitat. Additionally, the accidental spread of exotic aquatic invasive plants and animals has the potential for effects on potentially suitable habitat.

If construction activities associated with the above types of future projects occur in or near potentially suitable habitat during the least tern nesting season, the potential exists for disturbance of individuals if activities are conducted without project-specific coordination with applicable resource agencies and incorporation of approved conservation measures specific to interior least terns. Similarly, effects on individuals may occur during spring or fall migration. However, habitat and disturbance effects at major river crossings from future projects would likely incorporate similar conservation measures to avoid and minimize effects on this species. As such, cumulative effects, if any, resulting from future non-federal projects, when considered with the effects of the proposed Project considered in this BA, are expected to be minor.

3.2.2.6. Determination

Effect on the Species

The proposed Project, and therefore, the Proposed Federal Decisions, "<u>may affect, but is not likely</u> <u>to adversely affect</u>" interior least terns. This determination is based on Keystone's plan to use HDD when crossing the Missouri, Platte, Elkhorn, Niobrara, Cheyenne, and Yellowstone rivers and Keystone's commitment to follow conservation measures identified by the USFWS. Specifically, pre-construction surveys to identify nesting least terns within 0.25 mile of the proposed river crossings and the commitment to halt construction should nesting individuals be identified, would avoid effects on nesting interior least terns. While migrating least terns may encounter construction activities during spring and fall migration, effects on potentially suitable habitat are not expected due to the use of HDD.

Although new electric power lines could potentially increase the collision and predation potential for interior least terns, none of the proposed power lines would overlap suitable nesting or foraging habitat, and only a small portion of one power line, co-located on existing structures, would approach within 1 mile of potentially suitable nesting habitat.

The installation of bird flight diverters (BFDs) as a conservation measure for the whooping crane (see Section 3.2.3.3 below) may incidentally reduce the risk of collision with power lines for other bird species, including the interior least tern. In a study of the effectiveness of spiral BFDs for several types of water birds, shorebirds (a group that includes terns) exhibited the most consistent responses, crossing marked lines higher, showing fewer severe or abrupt flight changes when nearing the lines, and, possibly, resulting in fewer lethal collisions (Cassidy et al. 1998). A metaanalysis of 21 wire-marking studies estimated that marking decreased bird collisions by an average of approximately 78 percent (range of uncertainty 55 to 94 percent) (Barrientos et al. 2011). A recent systematic review of 191 studies of birds and power lines summarized the state of the art and the gaps in current knowledge (Bernardino et al. 2018). In particular, information is lacking regarding species-specific risks, the relationship(s) between collision mortality and population effects, and the best type and spacing of BFDs (Bernardino et al. 2018). At a site in North Dakota, Sporer et al. (2013) used field observations and multi-variable modeling at a power line crossing near Audubon National Wildlife Refuge to estimate that BFDs reduced collisions there by approximately 43 percent. Few studies focused specifically on least terns, and, because this species is agile, collisions with power lines were not identified as a threat to recovery in the 1990 recovery plan (USFWS 1990). Henderson et al. (1996) reported that terns rarely collide with power lines; however, by observing one breeding colony of the common tern (Sterna hirundo) during one quarter of the breeding season, the authors estimated that 0.4 percent of the population died from collisions with nearby unmarked power lines. Given that the least tern is approximately half the size of the common tern and is more maneuverable, the collision risk would likely be lower for the least tern than the common tern. NGPC has documented the death of an interior least tern that resulted from colliding with a power line over the lower Platte River in Saunders County, Nebraska, even though the line was equipped with aerial marker balls (Dinan et al. 2012). Thus, the installation of BFDs would reduce but not eliminate the risk of collision with power lines. However, the proposed power lines would not cross any potentially suitable nesting habitat for

interior least terns; therefore, the risk of collision is minimal. Similarly, collisions with power lines during fall and spring migration are not expected, as least terns generally follow major river drainages where they nest to the Mississippi River before turning south for the Gulf of Mexico (USFWS 2013b), and none of the proposed power lines cross major rivers that have been identified as potentially suitable for use by interior least terns.

Although it is possible that a spill event could result in effects on this species, effects on interior least terns are unlikely due to the low probability of a spill, the likelihood that most spills would be very small in size, and the very low probability of the spill coinciding with both the location and presence of individual least terns.

Considering the conservation measures that would be implemented as part of the proposed Project, effects on this species would be insignificant and discountable.

3.2.3. Whooping Crane—Endangered

3.2.3.1. Natural History and Habitat Association

The whooping crane was listed as endangered on March 11, 1967 (Endangered Species, 32 Fed. Reg. 48 [March 11, 1967]). Whooping cranes are migratory birds that occur only in North America. In 2018, the total wild population was estimated to be 849 birds (ICF 2018). This estimate includes (1) 505 birds in the self-sustaining Aransas-Wood Buffalo Population (AWBP) that winters in coastal marshes in Texas and migrates to Canada to nest in Wood Buffalo National Park and adjacent areas; (2) 181 captive-raised birds that have been released in Florida and the eastern United States in an effort to establish a non-migratory population in Florida and a migratory population between Florida and Wisconsin; and (3) 163 whooping cranes currently in captivity (ICF 2018). The last remaining bird in the Rocky Mountain reintroduced population died in the spring of 2002 (CWS and USFWS 2007). The overall decline of the whooping crane has been attributed to habitat loss, direct disturbance and hunting by humans, predation, disease, and collisions with manmade features (CWS and USFWS 2005). The greatest source of mortality to fledged juvenile whooping cranes on their first migration is collision with power lines (Stehn and Wassenich 2008). The following analysis is restricted to individual whooping cranes in the AWBP that have some potential to encounter the proposed Project during spring and fall migration.

During spring and fall migrations, the AWBP population moves through the central Great Plains including portions of Montana, North Dakota, South Dakota, and Nebraska. Birds from the AWBP population depart from their wintering grounds in Texas from March through May. Fall migration typically begins in September with most birds arriving on wintering grounds in October and November (CWS and USFWS 2005).

Historically, the sole source of data used to define the migration corridor of the whooping crane has been historical observations of migrating whooping cranes. Recently, Pearse et al. (2018) updated the presumed migration corridor using opportunistic confirmed sightings from 1946 to 2016, as well as location data collected between 2010 and 2016 from 58 cranes outfitted with radio

transmitters (Figure 3.2-1).^{5,6} Generally speaking, the migration corridor includes areas of the Great Plains similar to those identified in past efforts using historical observations (Kuyt 1992; Pearse et al. 2018; Stehn and Wassenich 2008; Tacha et al. 2010). Similar to the historical 198.8-mile-wide corridor, the Pearse et al. (2018) migration corridor has an average width of 182.7 miles

The new corridor varies in width by ± 40 percent along its length, as it includes areas where cranes spread out longitudinally across the landscape, as well as areas where cranes used a narrower migration corridor (Pearse et al. 2018). Narrower portions of the Pearse et al. corridor may reflect the scarcity of suitable stopover sites available to migrating cranes, while wider portions of the corridor north of the Platte River and Nebraska Sand Hills regions in Nebraska and the Prairie Pothole Regions of South Dakota, North Dakota, and Saskatchewan may reflect migrating cranes searching for suitable habitat due to the density, distribution, and temporary nature of the wetland resources in the region (Pearse et al. 2018). In addition to delineating a well-defined migration corridor for the whooping crane, Pearse et al. (2018) documented an easterly centerline shift in crane locations over time. The shift is most pronounced in South Dakota, but is detectable from northern Oklahoma to Saskatchewan. The shift is a result of locations west of the historical centerline moving eastward and not a result of cranes using novel habitats east of the historical centerline. Further, no trends of locations east of the centerline moving east were observed (Pearse et al. 2018).

Whooping cranes use a variety of habitats during migration (Howe 1987; Lingle 1987; Lingle et al. 1991; Johns et al. 1997). The whooping crane is most closely associated with river bottoms, marshes, potholes, reservoirs, prairie grasslands, and croplands (CWS and USFWS 2007).

⁵ This document sourced the Provisional Whooping Crane Telemetry Database from the Central Flyway stretching from North Dakota to Texas. The data is managed and owned by the USFWS. The Telemetry Database was provided to Environmental Resources Management (ERM). The USFWS has not directed, reviewed, or endorsed any aspect of the use of the Telemetry Database. Any and all data analyses, interpretations, and conclusions drawn from these data are solely those of ERM.

⁶ This document includes whooping crane migration use data from the Central Flyway stretching from Canada to Texas, collected, managed, and owned by the USFWS. Data were provided to ERM as a courtesy for their use. The USFWS has not directed, reviewed, or endorsed any aspect of the use of these data. Any and all data analyses, interpretations, and conclusions drawn from these data are solely those of ERM.





Throughout the migration corridor, with the exception of Nebraska, whooping cranes generally use shallow, seasonally or semi-permanently flooded palustrine wetlands, broad river channels, and shallow portions of reservoirs for roosting, and various croplands and emergent wetlands for feeding (Austin and Richert 2001; Johns et al. 1997). Whooping cranes have also roosted at stock ponds. During migration, whooping cranes generally feed on agricultural grains, aquatic plants, insects, crustaceans, and small vertebrates (CWS and USFWS 2007). Cranes are often observed in riverine habitat in Nebraska where they roost on submerged sandbars in wide unobstructed channels that are isolated from human disturbance (Armbruster 1990).

3.2.3.2. Potential Presence in Action Area

The whooping crane occurs as a migrant throughout the action area (USFWS 2012). Whooping cranes use shallow, sparsely vegetated streams and wetlands in which they feed and roost during migration. Migration periods for the whooping crane can vary widely with weather patterns. In general, spring migration extends from March 1 through May 31, and fall migration extends from September 1 through November 30. Whooping cranes pass though the eastern edge of Montana and through South Dakota and the central third of Nebraska, where they use suitable roosting and foraging habitats in riverine and wetland systems.

USFWS flyway historical sighting data (USFWS 2018d) and USGS telemetry data (Pearse et al. 2018) were reviewed for recorded ground sightings of whooping cranes in proximity to the action area (see Figures 3.2-2, 3.2-3, and 3.2-4). Unlike telemetry data, historical USFWS data have the major limitation that the data are dependent on human observation and likely result in false negative information in remote locations.













The telemetry data were collected from 2009 through 2016 from 58 tagged whooping cranes. This represents the best available scientific information because this data set is not dependent on human observation and is a large data set representative of the entire AWBP. The telemetry data do have some limitations as well. The telemetry data provide insight into crane habitat selection and use during migration, but do not provide a reliable estimate of numbers of individuals using a site, as each telemetry location may represent a small family group of cranes or a single bird migrating alone. An additional layer of complexity is the fact that whooping cranes do not seem to have fidelity to fixed stopover locations each year, though some areas are used by many individuals every migration season (e.g., the Platte River in Nebraska). Given this lack of fidelity to stopover sites used during previous migrations, the following assessment of potential presence of the species uses a conservative 5-mile buffer to account for previous whooping crane records (both historical and telemetry) that exist in proximity to the action area.

Ill-timed human activities in the vicinity of important roosting and feeding habitats can disturb whooping cranes. Power lines could pose a collision risk to whooping cranes if located near wet meadows, wetlands, stock ponds, and other waterbodies (USFWS 2012). Based on geographical information system (GIS) analysis, a total of 355 miles of the proposed pipeline and associated facilities, plus approximately 115 miles of new power lines, are located within the Pearse et al. (2018) 95 percent whooping crane migration corridor (Table 3.2-3, Figure 3.2-1). This corridor is a polygon that encompasses 95 percent of the verified historical records and recent telemetry records, and it represents the area where effects on migrating whooping cranes may potentially occur.

Table 3.2-3Miles of Proposed Pipeline and Power Lines within the 95 Percent Whooping
Crane Migration Corridor

State	Pipeline (miles)	Power Line (miles)
Montana	0	0
South Dakota	223.5	109.9
Nebraska	131.5	5.5
Total	355.0	115.4

Some of the action area falls outside of the 95 percent flyway migration corridor. All of the action area in Montana and a portion of the action area in South Dakota are located west of the corridor. In addition, a relatively small portion of the action area in Nebraska is located east of the Pearse et al. (2018) 95 percent whooping crane migration corridor. However, individual birds can be found outside the 95 percent migration corridor, and could possibly occur within the action area in Montana, South Dakota, and Nebraska during spring and fall migrations. Possible areas used by whooping cranes during migration would include major river systems and their associated wetlands, as well as palustrine wetlands and shallow areas of reservoirs, stock ponds, and lacustrine wetlands for roosting with agricultural croplands for foraging in the vicinity.

Montana

During a meeting with Keystone representatives on February 3, 2009, the MFWP identified the Yellowstone River as a potential stopover site for whooping cranes (AECOM 2009d). A total of nine confirmed historical sightings of whooping cranes have been documented in Montana counties within 5 miles of the action area; two of the sightings are located within 5 miles of the action area (Table 3.2-4). A confirmed historical record is located within 5 miles of the proposed PS-09 ROW directly adjacent to or on BLM-managed land. No recent telemetry records were documented in Montana counties within 5 miles of the action area (Table 3.2-4).

North Dakota

A pipe yard/rail siding for the proposed Project is located in Bowman County, North Dakota. A single historical whooping crane record has been documented in the county and it is located within 5 miles of the pipe yard. No recent telemetry records were documented in Bowman County (Table 3.2-4). The action area is located within 5 miles of Adams County, North Dakota; a total of one historical and 33 recent telemetry records have been documented in Adams County, but none within 5 miles of the action area.

South Dakota

The Missouri River system is used by whooping cranes in South Dakota, but cranes also can use any wetland during severe weather episodes, in addition to the more commonly used wetlands close to agricultural lands where they can feed. Correspondence with SDGFP indicates that the White and Cheyenne rivers contain suitable stopover habitat, although it is very unlikely that whooping cranes would be present at the proposed crossings (AECOM 2008b). A total of 87 confirmed historical sighting of whooping cranes have been documented in South Dakota counties within 5 miles of the action area; eight of the sightings are located within 5 miles of the action area (Table 3.2-4). Three historical observations are located within 5 miles of lands subject to WAPA interconnection decisions and/or RUS financing. No historical records are located within 5 miles of BLM-managed lands. A total of 915 recent telemetry records have been documented in South Dakota counties within 5 miles of the action area, 71 of which are located within 5 miles of the action area (Table 3.2-4). A total of 10 recent telemetry records are located within 5 miles of the action area (Table 3.2-4). A total of 10 recent telemetry records are located within 5 miles of the action area (Table 3.2-4). A total of 10 recent telemetry records are located within 5 miles of lands subject to a WAPA interconnection decision and/or RUS financing.

Nebraska

According to the USFWS Grand Island Ecological Services Field Office and the NGPC, major river systems used by whooping cranes in Nebraska include the Platte, Loup, Republican, Cedar, and Niobrara rivers (USFWS 2008c). Of these, the Platte and Niobrara rivers intersect the action area. Historical and recent telemetry records also exist at the Elkhorn River in Nebraska. The NNHP has recorded six whooping crane occurrences in Antelope, Keya Paha, Pierce, Rock, and Saline counties (NNHP 2019). The only designated critical habitat for the whooping crane in Nebraska is located along a stretch of the Platte River west of the action area (CWS and USFWS 2007). The MAR crossing of the Platte River would be approximately 78 miles east of the designated critical habitat and 14.36 miles east of the estimated 2018 whooping crane 95 percent

migration corridor. A total of 70 confirmed historical sightings of whooping cranes have been documented in Nebraska counties within 5 miles of the action area; five sightings are located within 5 miles of the action area (Table 3.2-4). A total of 1,003 recent telemetry records have been documented within Nebraska counties crossed by the action area; 163 telemetry records are located within 5 miles of the action area (Table 3.2-4).

The USACE may issue verifications in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. PCNs are anticipated for other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

Kansas

The action area does not include the State of Kansas. However, the terminus of the proposed Project is within 5 miles of Washington County, Kansas. There are no historical records of whooping cranes in Washington County. A total of two recent telemetry records have been documented in Washington County, none of which are within 5 miles of the action area (Table 3.2-4).

Table 3.2-4Historical and Recent Telemetry Locations Documented Within Montana,
North Dakota, South Dakota, Nebraska, and Kansas Counties within 5 Miles
of the Action Area

State	County	Historical Records	Historical Records	Telemetry Records	Telemetry Records
MT	Phillips	1	0	0	0
MT	Valley	2	0	0	0
MT	Garfield	0	0	0	0
MT	McCone	1	0	0	0
MT	Dawson	1	1	0	0
MT	Wibaux	2	0	0	0
MT	Prairie	0	0	0	0
MT	Custer	1	0	0	0
MT	Fallon	1	1	0	0
MT	Carter	0	0	0	0
MT Total		9	2	0	0
ND	Bowman	1	1	0	0
ND	Adams	1	0	33	0
ND Total		2	1	33	0
SD	Harding	0	0	0	0
SD	Butte	3	0	0	0
SD	Perkins	5	1	4	0
SD	Meade	2	0	8	0
SD	Ziebach	2	0	18	0
SD	Pennington	3	1	0	0
SD	Hakkon	4	3	62	10
SD	Stanley	15	0	9	0
SD	Jackson	3	0	0	0

State	County	Historical	Historical Records	Telemetry	Telemetry Records
a b		Records	within 5 Miles ^a	Records	within 5 Miles ^a
SD	Jones	0	0	5	3
SD	Mellette	2	0	42	0
SD	Lyman	13	0	55	0
SD	Tripp	7	1	17	1
SD	Brule	11	2	428	51
SD	Aurora	12	0	175	6
SD	Gregory	5	0	92	0
SD Total		87	8	915	71
NE	Keya Paha	20	1	23	8
NE	Rock	16	0	264	21
NE	Boyd	3	0	51	38
NE	Holt	15	2	305	43
NE	Knox	7	0	169	0
NE	Antelope	3	1	48	48
NE	Pierce	0	0	7	0
NE	Boone	1	0	55	0
NE	Madison	1	1	2	0
NE	Stanton	0	0	0	0
NE	Platte	1	0	50	0
NE	Colfax	0	0	3	0
NE	Butler	1	0	2	2
NE	Seward	0	0	3	3
NE	Saline	1	0	3	0
NE	Jefferson	1	0	13	0
NE	Gage	0	0	5	0
NE Total		70	5	1,003	163
KS	Washington	0	0	2	0
KS Total		0	0	2	0
Grand Tota	1	168	16	1,953	234

Sources: USFWS 2018d; Pearse et al. 2018

^a Within 5 miles of the action area (proposed Project and associated infrastructure, including power infrastructure)

3.2.3.3. Conservation Measures

Keystone, or electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on migrating whooping cranes and potentially suitable habitat for the species.

- Crossings of major rivers and riverine habitat will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season.
- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Should HDD activities occur at night, lights will be down-shielded during the spring and fall whooping crane migration seasons in areas that provide potentially suitable habitat.
- Where practicable, vegetative screening at HDD sites will be maintained to prevent disturbance of whooping cranes.

- During spring (March–May) and fall (October–November) whooping crane migration periods, environmental monitors will complete a daily brief survey of any wetland or riverine habitat areas potentially used by whooping cranes in the morning and afternoon before starting equipment and following the Whooping Crane Survey Protocol previously developed by the USFWS and NGPC (USFWS 2017d). If whooping cranes are sighted, the environmental monitor will immediately contact the USFWS and respective state agency in Nebraska, South Dakota, and/or Montana for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area. The compliance manager will record the sighting, bird departure time, and work start time on the survey form. The USFWS will notify the compliance manager of whooping crane migration locations during the spring and fall migrations through information gathered from the whooping crane tracking program.
- Keystone will re-vegetate disturbed areas (particularly within riparian zones and in wetland habitats) in accordance with the CMRP and USACE Nationwide Permit 12 requirements.
- Use of helicopters within 0.5 mile of any whooping crane(s) will be prohibited.
- Keystone will prepare and implement a project-specific SPCC Plan.
- Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite.
- Refueling and lubrication of construction equipment will occur in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.
- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible.
- Equipment will not be washed in streams or wetlands.
- Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials.
- Water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow.
- Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source

within a 30-day period except where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.

- During aerial surveillance, aircraft will maintain at least 1,000 feet of elevation.
- Should power line routes be adjusted, they will be sited greater than 5 mile from Designated Critical Habitat and/or documented high-use areas.
- Power providers will mark new lines within 1 mile of potentially suitable habitat within the 95-percent migration corridor.
- Power providers will mark new lines near potentially suitable habitat outside the 95-percent migration corridor at the discretion of the local USFWS Ecological Services Field Office, based on the biological needs of the whooping crane. Thus far, this will include the following:
 - The power line to PS-09 will be marked with BFDs within 0.25 mile of crossings of the Milk River.
 - The power line to PS-10 will be marked with BFDs within 0.25 mile of crossings of the Milk River and within 0.25 mile of two unnamed reservoirs crossed by the line.
 - The power line to PS-12 will be marked with BFDs within 0.25 mile of crossings of the Redwater River and Buffalo Springs Creek.
 - The power line to PS-14 will be marked with BFDs within 0.25 mile of crossings of Pennel Creek and an unnamed pond in the northwest corner of section 35, township 9 north, range 58 east, in Fallon County, Montana.
- Keystone will develop a compliance monitoring plan that requires written confirmation that the power lines have been marked and that the markers are maintained in working condition.
- Power providers will complete daily presence/probable absence surveys in potentially suitable habitat according to the Project's protocol described above if construction occurs during the spring and fall migration periods. Should a whooping crane be sighted within 0.5 mile of a work area, all work will cease until the whooping crane leaves that immediate area. USFWS and NGPC will be contacted immediately and notified of the presence of whooping crane.

3.2.3.4. Effects of the Action

Pipeline Construction

The primary construction-related effects to whooping crane would be temporary disturbance and potential temporary exposure to small fuel spills and leaks from construction machinery. The effect of construction-related spills within whooping crane roosting and foraging habitat would be minimal, as described in detail below. In light of the conservation measures described above and in Keystone's CMRP (Appendix B) and spill response plan (Appendix D), these types of effects would be unlikely to occur.

Suitable roosting and/or foraging habitats occur within the action area at major river crossings including the Yellowstone, Cheyenne, White, Niobrara, Elkhorn, and Platte rivers, in addition to

small wetland habitats and agricultural fields distributed across the action area. Habitats at these rivers would be crossed by HDD, so potential habitat loss, alteration, or fragmentation would be negligible. Limited human access would be required within the riparian areas of these rivers in order to use the Tru-Tracker® cable associated with drilling equipment and in order for equipment to access these rivers to potentially withdraw water for HDD and hydrostatic tests for the proposed Project. No effects are anticipated because construction activities, including HDD activities, will cease if whooping cranes are identified during daily pre-construction surveys.

Any vegetation disturbance adjacent to suitable riverine habitat would be allowed to completely revegetate following construction. Based on the current migration pathway of this species, potential occurrence on the ground within or near the action area could occur but would be extremely rare and would be limited to a few individuals or small groups of migrant birds (CWS and USFWS 2007).

To the greatest extent practicable, wetland habitat with the potential to be used by migrating whooping cranes would be avoided as part of the USACE required wetland avoidance and minimization. Additionally, standard sediment and erosion control BMPs would be applied to adjacent habitats to protect wetland resources that may be used by migrating whooping cranes.

Temporary effects could result from migrating individuals being disturbed and displaced due to noise, lighting from nighttime operations, and human presence during construction, if construction were to occur during spring or fall migrations, resulting in increased energy expenditure. However, these effects are not likely to be biologically significant and potentially suitable habitat is widespread throughout the migration corridor. An estimated 355 miles of the 882-mile pipeline route lies within the whooping crane central flyway 95 percent migration corridor that is based on historical whooping crane sightings and recent telemetry locations (see Figure 3.2-1; Pearse et al. 2018).

The proposed water withdrawals are unlikely to affect roosting or foraging habitats along the rivers used by whooping cranes. Temporary withdrawals of water (e.g., for hydrostatic pipeline testing) have some potential for effects on potentially suitable foraging habitat for this species. However, implementation of conservation measures as outlined in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS would help minimize effects, and these effects, if any, will be insignificant and discountable. Specifically, only the volume of water needed will be withdrawn, withdrawals will be limited to less than 10 percent of daily base flow, and the water will be returned back to its source at the conclusion of hydrostatic testing. Furthermore, temporary effects on downstream water quality would also be avoided by the measures described in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS.

In remote areas where construction camps are required, additional temporary effects on migrating whooping cranes resulting from disturbance and loss of potential suitable habitat may occur if construction occurs during the spring or fall migration periods. As discussed in Appendix C, all of the proposed construction camps are located on sites currently in active row-crop production. While no riverine or wetland roosting habitat would be affected by any of the proposed camps, the sites may provide potentially suitable foraging habitat (i.e., row crops). As significant acres of potentially suitable foraging habitat in the immediate vicinity of the proposed camps would remain

available to migrating whooping cranes, effects resulting from disturbance or loss of potentially suitable foraging habitat, if any, would be insignificant and discountable.

Given the conservation measures to be implemented relative to whooping cranes, as outlined in Section 3.2.3.3, effects resulting from construction of the proposed pipeline, if any, would be insignificant and discountable.

Operations

Normal operation of underground proposed-Project elements would not be expected to affect the whooping crane or stopover habitats used during migration. A complete discussion of potential long-term effects on migrating whooping cranes resulting from exposure to new power lines required for the proposed Project is provided below.

Pipeline surveillance would involve routine low-level aerial over-flights 26 times per year at intervals no greater than every 3 weeks and/or ground-based inspections once per year. Over-flights during migration periods would have the potential to disturb migrant whooping cranes and result in temporary effects. Most over-flights would normally be during late-morning or mid-day at an altitude of about 1,000 feet, although over-flights could occur at any time of day. Flights at this altitude would be unlikely to disturb roosting or foraging cranes. Ground-based maintenance inspections that would require external pipeline examination would be unlikely to coincide with crane roosting or foraging habitats, but would have the potential to temporarily disturb migrant cranes, if present on the landscape.

Emergency repairs and other maintenance activities could also result in temporary effects on whooping cranes if completed in or near potentially suitable habitat during spring or fall migration. Given that the frequency, location, and extent of such activities cannot be predicted with certainty, quantifying when and where individuals would be disturbed cannot be predicted. However, any such disturbance would likely be limited to individuals temporarily leaving the construction area for the duration of construction, and effects, if any, would be insignificant and discountable.

Potential Spills

The likelihood of a spill occurring within the known range of the whooping crane is shown in Table 3.2-5. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Habitat surveys have been completed along the entire pipeline ROW, and in some cases extended beyond the ROW to a total width of 300 feet; these found that suitable habitat for listed species was absent from the survey corridor within much of the species' known ranges. Therefore, the likelihood of spills occurring within suitable habitat for this species would be lower than that listed in Table 3.2-5.

T-LL 2 2 5	T Harlth and a Cartha	O			.
1 able 3.2-5	Likelinood of Spills	Occurring	within the Kan	ige of the wh	ooping Crane

Resource (Species Range)	Small Spills par Voor	Medium Spills per	Longo Spille por Voor	Estimated Years Between Spills within
	Sman Spins per Tear	Ital	Large spins per Tear	Species Kange
Whooping crane	1.7	0.3	0.04	0.6

Spill volume cannot be predicted; however, because 80 percent of historical spill volumes are less than 50 barrels, the probable spill volume for a given incident is less than 50 barrels, which could result in a radial effect from the pipeline of up to 150 feet. A larger spill would likely result in a larger affected area, potentially extending radially up to 1,200 feet from the pipeline (see Appendix C). Of the 12 historical and 137 recent telemetry records within 5 miles of the proposed pipeline (Table 3.2-4), only one recent telemetry record is located within 1,200 feet of the proposed pipeline. That record is located approximately 864 feet from the proposed pipeline, outside the expected spread radius of a small or medium spill. All of the remaining historical and recent telemetry locations were derived from approximately 20 percent of the whooping crane population, the fact that only one location was in the vicinity of the proposed Project indicates that the likelihood of an individual crane occupying an area that is also affected by a spill is very low.

The major rivers near whooping crane habitat would be crossed using an HDD method that would result in a burial depth of 25 feet or more below the river bottom. In the event of a release, the crude oil would need to penetrate at least 25 feet of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and the potential for exposure. Additionally, these major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for the HDD method. As a result, it is highly unlikely that a release from the pipeline would occur coincident with these locations when a whooping crane is present.

If a significant release were to occur, federal and state laws would require cleanup. If the pipeline were transporting dilbit at the time of a release to a river, cleanup may require specialized methods, possibly including dredging, based on the tendency of dilbit to sink in water. Submerged dilbit could result in a persistent source of contamination because of the slow rate of natural degradation of this material. Thus, submerged dilbit could result in the slow release of dissolved hydrocarbons, resulting in long-term effects on organisms. Removal of submerged product from the water column can be a difficult and long process, as observed in the response and cleanup efforts related to the July 2010 release in Marshall, Michigan, to the Kalamazoo River. Cleanup efforts to remove the submerged oil from that river, including dredging, excavation, and aeration, continued for 4 years after the spill (Parker 2014). Lighter or less viscous oils may spread more rapidly than dilbit, but may be more amenable to recovery and natural degradation.

The body of the current literature indicates that this species is very wary and does not tolerate human disturbance (see Lewis and Slack 2008). Further, the USFWS states that whooping cranes will avoid locations with human disturbance, especially humans on foot, even when habitat in the vicinity is otherwise suitable (CWS and USFWS 2007, USFWS 1980). Given that whooping cranes are intolerant of human disturbance, direct contact with an oil spill could potentially occur only if an individual is located at the site of the spill before responders arrive on the scene. As described in Appendix C, emergency spill response times would be no more than 12 hours. Once emergency response crews arrive on the scene, whooping cranes would not enter the site. Therefore, it is highly unlikely that a whooping crane would encounter a spill.
Direct contact with crude oil could result in effects on whooping cranes due to oiling of plumage; crude oil ingestion from contaminated plumage or water; and bioaccumulation of certain components of the spilled product entering via ingested prey. While these exposure risks have the potential to cause effects on individuals, the probability of such effects on whooping cranes is extremely low due to 1) the low probability of the spill coinciding with the presence of migrating whooping cranes given the extremely low number of individuals, 2) the low probability of the spill coinciding with migration stopover habitats given the widespread and patchy distribution of roosting and foraging habitat, as evidenced by the lack of historical and recent telemetry records within 1,200 feet of pipeline, 3) the low probability of a whooping crane contacting the spilled crude oil given the short duration of time that a migrating crane could potentially be present within the action area, and 4) the maximum 12-hour window that a spill site could not have humans present.

Power Infrastructure

Power lines associated with the proposed Project and occurring within the whooping crane migration corridor (i.e., power lines to PS-16 through PS-23) could pose collision hazards to migrant whooping cranes and result in long-term effects on the whooping crane. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, where available, was also used to determine the extent of potential habitat near the proposed Project.

Collisions with power lines are a major source of mortality for fledged whooping cranes of the migratory AWBP (Fjetland 1987; Lingle 1987; Lewis et al. 1992; Stehn and Wassenich 2008). The risk to migrating cranes is greatest when cranes are making short, low-altitude flights between roosting and foraging sites, which often occur during low-light conditions (Stehn and Wassenich 2008). Cranes flying over power lines from adjacent roosting or foraging habitats have less time to react to wires (Thompson 1978; Brown et al. 1987; Scott et al. 1972; Stehn and Haralson-Strobel 2014).

Observations of sandhill crane (*G. canadensis*, a closely related species that is often used as a surrogate to study whooping cranes) flight behaviors indicated that crane flocks reacted more to power lines (i.e., their natural behavior was altered to a greater degree) when flying less than 820 feet before crossing a power line. Cranes flying less than 820 feet before crossing a power line. Cranes flying less than 820 feet before crossing a power line rapidly gained altitude to fly 3 to 16 feet over the power lines, whereas cranes flying more than 820 feet before crossing power lines tended to fly greater than 20 feet above the power lines (Morkill and Anderson 1991; Stehn and Wassenich 2008). Further, according to studies at San Luis Valley in Colorado, no crane collisions were observed when habitat use areas were located greater than 0.99 mile from installed overhead power lines (Brown et al. 1987; Stehn and Wassenich 2008).

In an effort to alert birds to the presence of power lines, especially smaller diameter ground wires, a variety of BFDs have been installed on power lines, with reductions in bird collisions ranging from 0 to 81 percent (Jenkins et al. 2010). Observed variability in collision reduction is a result of

many factors such as time of year, time of day, weather conditions, power line span distance, wire diameter, power line orientation in relation to occupied habitat, and species-specific biology (Barrientos et al. 2011; Jenkins et al. 2010). While the efficacy of BFD devices can vary widely, overall, a review of 21 power line marking studies concluded that BFDs reduce avian collisions by 55 to 94 percent (Barrientos et al. 2011). However, larger birds that are less maneuverable in flight (i.e., cranes, storks, geese, etc.) generally are more likely to collide with marked or unmarked power lines than smaller birds are.

In Nebraska, significant sandhill crane mortality resulting from collision with two existing 69-kilovolt (kV) power lines crossing the Platte River has been observed (Murphy et al. 2009; USFWS 2009; Wright et al. 2009). One study conducted during the spring migration in 2007 estimated that between 165 and 210 sandhill cranes did not survive collisions with the two power lines (Wright et al. 2009). No evidence of whooping crane mortality was observed during that study. From March 4 to April 8, 2009, Murphy et al. (2016) observed the power lines and recorded crane reactions. A total of 448 flocks of sandhill cranes were observed during the 2009 spring migration. Sandhill cranes reacted to the power lines at greater distances during daylight hours than during low-light conditions. Earlier reaction time would likely allow birds more time to avoid a power line. Use of power line markers with reflective, glow in the dark stickers to increase both daytime and nighttime visibility resulted in increased reaction distances and more gradual avoidance behaviors in sandhill cranes (Murphy et al. 2016). Generally, sandhill cranes are more likely to react to marked spans than unmarked spans, often gaining altitude beyond 16 feet above the wire, providing some indication that the marker balls were observed by cranes and avoided (Morkill and Anderson 1991; Stehn and Wassenich 2008). A recent study conducted by Dwyer et al. (2019) investigated the use of a pole-mounted near-ultraviolet light Avian Collision Avoidance System (ACAS) to illuminate the entire 256 meter span crossing the Platte river in an effort to further reduce sandhill crane collisions at the above described power line crossing, where a substantial number of collisions were occurring annually despite the fact that the line is marked with Firefly (FireFlys; P&R Tech, Beaverton, Oregon, USA) and yellow spiral BFD (Preformed Line Products, Cleveland, Ohio, USA) line markers. While the ACAS system was designed for use on non-marked lines, the span where the ACAS was tested is marked with Fireflys and BFDs installed at an average spacing of 2.9 meters (Dwyer et al. 2019). This is much denser that the current APLIC recommendation of 5-30 meter spacing (APLIC 2012). A 98 percent reduction in collisions was observed during the study. At this time it is unclear to what extent the illumination of previously installed Fireflys and BFDs influenced the resulting reduction in collisions, or if the ACAS system would have been as effective in the absence of the previously installed Fireflys and BFDs. In Nebraska, Murphy et al. (2016) documented studies of sandhill cranes, demonstrating that marking power lines can be an effective way to reduce sandhill crane collisions and would be expected to reduce collision risk for migrating whooping cranes (Morkill 1990; Morkilll and Anderson 1991). New novel approaches such as the use of the ACAS, either alone or with other forms of line marking, may even further the reduce collision risk for avian species, as demonstrated by Dwyer et al. (2019). However, while reductions in collision risk have been documented, some collision risk to whooping cranes may still exist (USFWS 2009). Therefore, a more detailed collision risk assessment was conducted.

Collision Risk Assessment

As described above, the potential exists for whooping crane mortality to occur as a result of collisions with the proposed power lines associated with the proposed Project. Further, substantial uncertainty exists around critical parameters (i.e., the proportion of total mortality that occurs during migration, the proportion of the total mortality that results from power line collisions, and proportion of the power line strikes that can be attributed to transmission lines) used to assess effects on whooping cranes (USFWS 2017a). However, as explained below, (1) more power lines do not appear to equate to more risk to whooping cranes, (2) projected proposed-Project risk to migrating whooping cranes, based upon historical whooping crane mortality data, is extremely small, and (3) Project-specific conservation measures to avoid and minimize bird collision risk will be applied; therefore, effects on migrating whooping cranes, if any, would be insignificant and discountable.

There is no indication that there is a causal link between the number of power line miles and potential collision risk to migrating whooping cranes (Bainbridge 2017). Using data obtained from WAPA, as well as inquiries to state rural electric associations, the Nebraska Public Power District (NPPD) (NPPD 2018) identified a total of approximately 34,000 and 291,000 miles of transmission and distribution lines, respectively, within the AWBP migration corridor in 2016, many of which were built after the Rural Electrification Act of 1936. From 1939 to the most current AWBP census, the population of whooping cranes has grown to 504 individuals (Figure 3.2-5). Despite the proliferation of power lines in the migration corridor and the increase in the AWBP numbers, increased mortality resulting from power line collisions has not been observed in the historical records or by current radio telemetry efforts (Stehn and Haralson-Strobel 2014; USFWS 2016c). In fact, the last known power line mortality was documented in 2002 (Stehn and Haralson-Strobel 2014).



Source: Butler and Harrell 2019; Butler et al. 2013; CWS and USFWS 2007; Stehn and Haralson-Strobel 2014.



70

Given the small size of the AWBP, it has been extensively monitored over the years and much information regarding population dynamics, individual mortality, and other life history characteristics has been collected. From 1959 to 2010, a total of 49 whooping crane mortalities resulting from power-line collisions have been documented across all populations, with a majority (39, or 80 percent) of collision mortalities occurring in the experimental, introduced flocks (Stehn and Haralson-Strobel 2014). However, these experimental flocks would not be exposed to the proposed Project, and there are significant behavioral, biological, environmental, and management differences between the experimental flocks and the AWBP. These differences include (1) experimental flocks have much higher exposure rates to power lines, (2) the experimental flocks are exposed to greater levels of human incursion into stopover habitat along the migration route, and (3) the AWBP is the only flock where young learn from the experimental flocks are not considered further in this assessment, and only AWBP mortality data were used.

Much of the undocumented crane mortality was once thought to occur during seasonal migrations between summer and wintering grounds (Lewis et al. 1992; Stehn and Haralson Strobel 2014; USFWS 2016c). However, recent telemetry studies have shown that mortality occurs across all seasons and observed mortality occurred generally in proportion to the time spent at each life history stage. A recent study deployed radio transmitters on 68 individual cranes between 2009 and 2014. A total of 17 whooping crane mortalities were documented from 2011 to 2015. Most of these mortalities occurred outside of migration periods, near primary nesting areas in Wood Buffalo National Park and at wintering sites on and near the Aransas National Wildlife Refuge. Just over 15 percent occurred during spring or fall migration periods, which occurs for 2 months of the year, or 17 percent of the time (Pearse et al. 2019; USFWS 2016b).

The risk to migrating whooping cranes as a result of the proposed Project power lines can be assessed using the null hypothesis and reasonably certain knowledge method proposed by USFWS (2018g).

<u>Null Hypothesis</u>: The power lines associated with the proposed Project will be no more or less hazardous than the average level of hazard from existing power lines within the 95 percent whooping crane migration corridor.

Reasonably Certain Knowledge:

- 1. Approximately 7,790 miles of transmission lines and 82,415 miles of distribution lines (or 90,205 total miles of power lines) exist in the migration corridor in Nebraska and South Dakota (NPPD 2019).
- 2. The proposed power lines would add approximately 115.4 miles of new power lines in the 95 percent whooping crane migration corridor, an increase of 0.13 percent.
- 3. Total annual post-fledging AWBP mortality averages 10.9 percent.
- 4. According to telemetry studies, 17.4 percent (4 of 23) of post-fledging mortality occurs during migration (Kyut 1992; Pearse et al. 2019).
- 5. Daily mortality rates are approximately constant across the annual cycle.

- 6. Approximately 55 percent of whooping crane migration days occur in the United States (Howe 1989).
- 7. From reasonably certain items 3) through 6), the proportion of the post-fledging AWBP that dies during migration across the United States is (0.109)(0.174)(0.55)=0.0104, or about 1 percent. At the current population level of 504 individuals (Butler and Harrell 2019), the current total mortality from all causes occurring during migration in the United States is about 5 individuals per year.

Other best available information that is not reasonably certain:

- 1. Power line strikes plus "physical trauma" mortality (highly suggestive of power line strikes, see Brown and Drewien 1995; Gil de Weir 2006) account for about 56 percent (14 of 25) of known-cause recovered mortality during migration (Stehn and Haralson-Strobel 2014). This estimate represents the best available information but is not reasonably certain because of potential biases in recovered mortality versus unrecovered mortality.
- 2. 25 percent (2 of 8) of known power line strikes in the United States occurred in Nebraska (n = 2) and South Dakota (n=0) combined (Stehn and Haralson-Strobel 2014). This estimate represents the best available information, but is not reasonably certain because of potential biases in recovered mortality versus unrecovered mortality.

Using reasonably certain item 6 and the other best available information items 1 and 2 above, the number of expected power line strikes per year in Nebraska and South Dakota at the current population size of the AWBP is (5)(0.60)(0.25)=0.75 strikes per year. Based on the null hypothesis, the rate of strikes due to power lines associated with the proposed Project would be 0.13 percent of this total, or 0.000975 strikes per year. Using a population growth scenario based on a 4.5 percent exponential growth rate, a reasonably certain estimate would be 0.149 fatal whooping crane collisions over the 50-year life of the project. This estimated result would be reasonably certain for unmarked power lines. However, portions of the proposed power lines will be marked with approved BFDs, further reducing the chances for fatal power line strikes associated with the proposed Project.

In addition to the overall Project-level risk assessment above, a more detailed assessment of the proximity of whooping crane habitat and occurrences relative to individual power lines required as a part of the proposed Project is described below.

At construction camps, electricity for the required camps would be provided by local utilities via an interconnection to the distribution system. All proposed construction camps are located adjacent to an existing low-voltage power lines (less than 69 kV). At most, a new low-voltage power line would be built from the existing power line across a roadway and in to the campsite, such as would occur at the camp in Holt County, Nebraska. As new power lines, if any, would only be needed to cross over roads, no effects on migrating whooping cranes, or their habitats, would be expected to occur. As such, any new power lines associated with construction camps, if necessary, are not included in the analysis below.

For power lines to pump stations, potentially suitable migration habitat (e.g., large waterbodies, wetlands, and other roosting habitat, as well as associated agricultural fields or other foraging

habitat) was identified at eight pump station locations where new power lines fall within the 75 percent or 95 percent whooping crane migration corridors (Pearse et al. 2018). These include:

- PS-16 Harding and Perkins counties, South Dakota (95 percent)
- PS-17 Meade County, South Dakota (95 percent)
- PS-18 Haakon County, South Dakota (95 percent)
- PS-19 Haakon and Jones counties, South Dakota (95 percent)
- PS-20 Tripp County, South Dakota (75 percent)
- PS-21 Tripp and Gregory counties, South Dakota (75 percent)
- PS-22 Holt County, Nebraska (75 percent)
- PS-23 Antelope County, Nebraska (95 percent)

For the purposes of this analysis, a distance of 5 miles was used as a conservative measure of the potential for cranes to use habitats in the vicinity of the proposed power lines, pursuant to USFWS guidelines to avoid construction of new power lines within 5 miles of documented high use areas and designated critical habitat (USFWS 2010). No high-use areas are located within 5 miles of the power infrastructure associated with the proposed Project. All of the historical occurrence records and recent telemetry locations within 5 miles represent a single stopover event, with no apparent pattern of use over multiple migration seasons. While some records of whooping cranes exist within 5 miles of the action area, studies have noted that no mortality has been observed when habitat use areas are greater than 0.99 mile from existing power lines (Brown et al. 1987; Stehn and Wassenich 2008). Sites that are greater than 1 mile from power lines allow for individuals to cross the power lines at sufficient altitude to avoid a strike (Brown et al. 1987). None of the proposed power lines are located within 1 mile of a historical record or a recent telemetry location.

The proposed Project includes the construction and operation of approximately 115.4 miles of new power lines within the 95 percent whooping crane migration corridor. These power lines would be sited an average of 7.2 miles (range = 1.8 to 11.8 miles) from confirmed historical observations and an average of 9.7 miles (range = 4.6 to 23.4 miles) from recent telemetry locations (Table 3.2-6). A total of three historical and 10 telemetry records are located within 5 miles of proposed power lines, but none are located within 1 mile of proposed power lines (Table 3.2-6). The 10 telemetry records within 5 miles represent a single stopover event in 2014. One historical record and no telemetry records are located within 3.5 miles of the action area, a distance typically traveled by whooping cranes from roost sites to foraging sites during spring and fall migration stopovers. While previous occurrences are not an accurate predictor of whooping crane use in the future, these data, which represent the best available science, indicate a very low rate of previous habitat use in proximity to the proposed power lines. Therefore, the proposed power lines present a significantly lower risk of collision than power lines placed in high-use areas documented within the migration corridor. Further, this lack of previous use may reflect either an abundance of potentially suitable habitat on the landscape (i.e., potentially suitable habitat is readily available to migrating whopping cranes) or the absence of habitat features that would attract migrating whooping cranes (e.g., the designated critical habitat along the Platte River in Nebraska, which is used by many individuals every year).

Pump Station	Migration Corridor ^a	Power Line Length (miles) ^b	Distance to Historical Occurrence (miles) ^d	Distance to Telemetry Occurrence (miles) ^e
PS-09		61.4	5.1	27.3
PS-10		48.4	6.0	48.7
PS-11		0.2	20.7	58.4
PS-12		4.6	41.7	55.0
PS-13		15.7	8.2	49.5
PS-14		6.9	24.6	44.6
PS-15		24.7	14.9	61.1
PS-16	95%	41.9 ^f	4.3	10.5
PS-17	95%	10.9	11.8	23.4
PS-18	95%	26.0	3.6	4.6
PS-19	95%	20.5	1.8	8.5
PS-20	75%	17.2	10.1	7.2
PS-21	75%	20.5	8.1	12.5
PS-22	75%	2.5	10.1	5.3
PS-23	95%	3.0	8.2	5.6
PS-23b		3.4	16.4	15.8
PS-24		1.0	15.3	4.0
PS-25		9.3	14.1	9.8
PS-26		0.1	17.7	6.9

 Table 3.2-6
 Whooping Crane Occurrence Relative to Proposed New Power Lines

^a 95 and 75 percent migration corridors represent a polygon that encompasses 95 and 75 percent, respectively of confirmed whooping crane migration observations (Pearse et al. 2018). A dash (-) indicates the pump station is located outside the corridors. ^b Power line lengths for PS-16 through PS-21 were provided by the applicant; lengths for PS-22 through PS-26 are estimated by

the NPPD.

^d Shortest straight-line distance from the nearest historical record location to the nearest point of the power line

^e Shortest straight line distance from the nearest telemetry record to the nearest point of the power line

^f Of the 41.9 miles of power line, only approximately 14.8 miles are located within the 95 percent whooping crane migration corridor.

As described above, the projected chance of a whooping crane colliding with a power line associated with the proposed Project is very small, though significant uncertainty exists around this projection. The above estimated 0.149 whooping crane collisions over the life of the proposed Project would be further reduced to insignificant and discountable levels through application of the following conservation measures (USFWS 2010):

- Power lines have not been sited within 5 miles of designated critical habitat or documented high use areas; and
- Within the 95 percent corridor, providers would mark new power lines within 1 mile of potentially suitable habitat pursuant to APLIC (2012) standards.

While there is some debate as to the efficacy of BFDs for the whooping crane, the literature clearly shows that BFDs can be an effective means to reduce collision risk by 40 to 60 percent for some

species (Barrientos et al. 2011; Brown and Drewien 1995; Morkill and Anderson 1991; Murphy et al. 2016; and Yee 2008). The USFWS (2010) *Region 6 Guidance for minimizing effects from power line projects within the whooping crane migration corridor* states that BFDs reduce collision risk, and that marking new lines and an equal length of existing lines within the migration corridor maintains the baseline condition from the threat of power line collisions (USFWS 2010).

Given that (1) the proposed new power lines could lead to a negligible increase in collision risk to migrating whooping cranes, (2) calculated collision risk based upon reasonably certain knowledge is very low, and (3) USFWS-approved conservation measures would be applied, effects, if any, to migrating whooping cranes resulting from the construction and operation of the proposed power lines would be insignificant and discountable.

3.2.3.5. Cumulative Effects

The Proposed Federal Decisions could potentially affect the whooping crane within its migration range in Nebraska, South Dakota, and Montana. Individual cranes could be disturbed by construction activities during spring and fall migration. Suitable habitat would be disturbed but the proposed Project has been designed so that habitat disturbance would be avoided and minimized to the extent practicable. Additionally, power lines associated with the proposed Project have the potential to result in collision-related mortality.

Future non-federal pipeline, power line, and residential or commercial development projects could result in reduced and fragmented preferred roosting and foraging habitat for the whooping crane at crossings of rivers, streams, and wetland habitats. Additionally, the accidental spread of exotic aquatic invasive plants and animals could add to cumulative effects on potentially suitable habitat. However, effects on the species due to these habitat changes would likely be insignificant since, to date, no pattern of site fidelity by individuals has been observed.

Future projects in the action area have the potential to incrementally contribute to this disturbance of individual migrating whooping cranes, if conducted without project-specific coordination with applicable resource agencies and incorporation of approved conservation measures specific to whooping cranes. Given the lack of site fidelity, quantifying when and where individuals would be disturbed cannot be predicted. However, any such disturbance would likely be limited to individuals temporarily leaving the construction area.

In the aggregate, future proposed electric power line projects would incrementally increase the collision risk for whooping cranes, particularly for projects sited between roosting and foraging habitat. Specific numbers of new or anticipated projects are difficult if not impossible to quantify. According to the collision risk assessment discussed above, an increase in the quantity of power lines within the migration corridor has not resulted in a corresponding increase in collision-related mortality.

Considering the minor effects due to habitat alterations, disturbance of individuals, and collision risk, cumulative effects on the whooping crane are also expected to be minor.

3.2.3.6. Determination

Effect on Critical Habitat

The proposed Project would not affect federally designated critical habitat for the whooping crane. The area of designated critical habitat for the whooping crane in Nebraska is 78 miles upstream from the proposed Platte River crossing, and other critical habitat areas are located more than 130 miles outside the action area.

Effect on the Species

While no documented whooping crane historical or telemetry observations have been identified within 1.5 miles of the action area, some potential exists for migrating whooping cranes to use potentially suitable habitat in the action area. However, given (1) the limited number of individuals, (2) the lack of historical or recent telemetry records in the action area despite the long-term nature of the historical data and the fact that the telemetry data are not dependent on human observation, (3) the low probability of a collision during migration, and (4) the proposed conservation measures developed in conjunction with the USFWS, the proposed Project "<u>may affect, but is not likely to adversely affect</u>" the whooping crane.

3.2.4. Pallid Sturgeon—Endangered

3.2.4.1. Natural History and Habitat Association

The pallid sturgeon was listed as endangered on September 6, 1990 (Endangered and Threatened Wildlife and Plants; Determination of Endangered Status of Pallid Sturgeon, 55 Fed. Reg. 173 [September 6, 1990]). This species is native to the Missouri and Mississippi rivers and is adapted to habitat conditions in these large rivers prior to river modifications. Preferred habitat is described as large, free-flowing rivers with warm, turbid water with a diverse mix of physical habitats that are in a continuous state of change (USFWS 1993). Pallid sturgeon are adapted for living close to the bottom of large, shallow, silty rivers with sand and gravel bars. Adults and larger juveniles feed primarily on fish, while smaller juveniles feed primarily on the larvae of aquatic insects (Wilson 2004).

Macrohabitat environments required by pallid sturgeon are formed by floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters within the large river ecosystem (USFWS 2012). Prior to dam development along the Missouri and Mississippi rivers, these features were in a continuous state of change. With the introduction of dams and bank stabilization, areas of former river habitat have been covered by lakes, water velocity has increased in remaining river sections, making deep stretches of clear water, and water temperatures have significantly decreased. All of these factors are believed to have contributed to the decline in pallid sturgeon populations (USFWS 1993).

The pallid sturgeon has never been common since it was first described in 1905, and catch records and recovery and research efforts since that time have indicated a steady decline in abundance (Wilson 2004). Except in the Platte River, where the population appears more abundant, pallid sturgeon are extremely rare in all of the rivers in the action area; for example, wild pallid sturgeon were estimated to number approximately 125 individuals across the more than 200 river miles of the lower Yellowstone River and Missouri River between Fort Peck Dam and Lake Sakakawea (USFWS 2014d). The historical range of this fish formerly included the Mississippi River (below its confluence with the Missouri River), the Missouri River, and the very lower reaches of the Platte, Kansas, and Yellowstone rivers near their confluence with the Missouri (USFWS 1993). According to the USFWS pallid sturgeon recovery plan (USFWS 1993), since 1980, reports of most frequent occurrence are from the upper Missouri River between the Marias River and Fort Peck Reservoir in Montana; in the middle Missouri River between Fort Peck Dam and Lake Sakakawea (near Williston, North Dakota); within the lower 70 miles of the Yellowstone River to downstream of Fallon, Montana; in the headwaters of Lake Sharpe in South Dakota; and from the lower Missouri River near the mouth of the Platte River near Plattsmouth, Nebraska. Although widely distributed, the pallid sturgeon remains one of the rarest fish in the Missouri and Mississippi river basins. The pallid sturgeon has been found in recent years (2010 and 2011) in the Milk River in Montana from the Missouri River to the Vandalia Dam (Fuller and Haddix 2012). In addition, pallid sturgeon are known to occupy the Yellowstone River at least as far upstream as river mile 229 (MFWP 2019). In the Niobrara River, pallid sturgeon have not been found above Spencer Dam.⁷ In the lower Platte River, the range of this species now extends upstream to Columbus, Nebraska. Pallid sturgeon spawning events appear to be very rare. The only pallid sturgeon spawning events recorded in recent years have been in 2007 in the lower Missouri River below the Gavins Point Dam (USGS 2007), in 2011 at Yellowstone River mile 6.8 (The Pallid Sturgeon – Recovery Program 2013), in 2011 in the Missouri River just downstream of its confluence with the Milk River (DeLonay et al. 2014), in 2012 in the lower Yellowstone River (USFWS 2014d), in 2014 in the Platte River near its confluence with the Missouri River (Davis 2015), and in 2014 in the Powder River tributary of the Yellowstone River in Prairie and Custer counties in Montana (French 2015).

Critical habitat has not been designated for the pallid sturgeon, but sections of rivers that maintain large, turbid, free-flowing river characteristics relatively unchanged by dam construction and operation are important in maintaining residual populations of this species. The current range has been divided into four management units in the revised species recovery plan (USFWS 2014d). Figure 3.2-6 shows the current range of the pallid sturgeon (USFWS 2014d) in relation to proposed-Project elements. The proposed Project crosses the Missouri, Yellowstone, and Milk rivers in the Great Plains Management Unit, and the Platte and Elkhorn rivers in the Central Lowlands Management Unit. Each of these rivers would be crossed using the HDD method.

⁷ Spencer Dam was destroyed in a flood on March 14, 2019, and may no longer represent a barrier to sturgeon (Yoders 2019).



Figure 3.2-6 Pallid Sturgeon Management Units and Proposed Project Elements

3.2.4.2. Potential Presence in Action Area

Locations with the potential for this species to occur in waters subject to the Proposed Federal Decisions are at the Fort Peck project and at the crossing of the Platte River. Additionally, the USACE may issue permits in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. PCNs are anticipated for other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

The potential for this species to occur within the overall action area exists at the pipeline crossing of the Milk River, at the pipeline crossing of the Missouri River below Fort Peck Dam, at the pipeline crossing of the Yellowstone River downstream of Fallon, Montana, and the pipeline crossing of the Platte River southeast of Columbus, Nebraska. The proposed crossing of the Niobrara River is approximately 31.1 river miles upstream of Spencer Dam, and thus outside of the pallid sturgeon range in this river. The proposed crossing of the Elkhorn River, just north of Tilden, Nebraska, is approximately 85 river miles upstream of the USFWS-designated pallid sturgeon range. The pallid sturgeon may also occur where the power line servicing PS-10 would cross the Milk River at three places within a meandering 0.85-mile stretch of river.

Historical occurrences of pallid sturgeon within 5 miles of the action area were documented in the Yellowstone River; two occurrences in 2007 and 2010 were in Dawson County, Montana, while one occurrence was documented in Prairie County in 2012 (MNHP 2019). Similarly, three occurrences of pallid sturgeon were documented in the Missouri River and dredge cuts associated with Fort Peck Dam. Two of these occurrences were documented in Valley County in 1985 and 2012, while one record was in McCone County in 2006. In 2011, three occurrences of pallid sturgeon were documented in Valley County.

3.2.4.3. Conservation Measures

Keystone will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the pallid sturgeon and potentially suitable habitat for the species.

- HDD would be used under the Milk, Missouri, Yellowstone, and Platte rivers.
- At least a 100-foot setback from the water's edge for the HDD drill pads would be used at the HDD crossings at the Milk, Yellowstone, Missouri, and Platte rivers.
- Potential releases during HDD (frac-outs) would be contained by BMPs that are described within the HDD contingency plans required for drilled crossings.
- Broadcast applications of pesticides or herbicides would be avoided within 0.25 mile of water bodies.
- Upstream and downstream fish passage would be maintained during any stream habitat disturbance.

- The intake end of any water withdrawal pump would be screened with mesh having openings no larger than 0.125 inch, a floating surface intake would be used to avoid the benthic habitat used by the sturgeon; water velocity at the screen would not exceed 12 centimeters per second to prevent entrainment of larval fish, and the intake screens would be periodically checked for fish impingement. Should a sturgeon become impinged against the screen, all pumping operations would immediately cease and the compliance manager for Keystone would immediately contact the USFWS to determine if additional protection measures would be required.
- Water withdrawal from the Milk, Missouri, and Yellowstone rivers for any purpose would be avoided from May 15 through July 15 of any year to avoid pallid spawning periods and the impingement and entrainment of free embryos and larval pallid sturgeon that drift with the current during that time of year.
- Water withdrawal from the Platte River for any purpose would be avoided March 1 through June 30 of any year to avoid pallid spawning periods and the impingement and entrainment of free embryos and larval pallid sturgeon that drift with the current during that time of year.
- Care would be taken during the discharge to prevent erosion or scouring of the waterbody bed and banks to avoid impacts to spawning habitat for the species. Hydrostatic test discharge would be in upland locations near the source of the water. Water would be discharged over several days and through a hay bale apparatus or other velocity reduction and erosion control device.
- Temporary water reductions would be avoided based on Keystone's plan to withdraw the volume needed and to return water back to its source within a 30-day period for the Platte River.
- Major rivers would be crossed using the HDD method with a pipeline burial depth of 25 feet or greater below the river bed to avoid direct impacts to habitat.
- Proposed HDD entry and exit points are more than 600 feet from the Platte River; if these points are changed, at least a 100-foot setback from the water's edge would be maintained.
- Measures identified in a required HDD contingency plan would be implemented, including monitoring of the directional drill bore, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur.
- Major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for the HDD method.

3.2.4.4. Effects of the Action

Pipeline Construction

The Milk, Missouri, and Yellowstone rivers crossed by the proposed pipeline in Montana and the lower Platte River in Nebraska would be crossed using the HDD method. Therefore, no effects on pallid sturgeon habitat are expected to occur as a result of proposed pipeline construction (USFWS)

2008e). Although pallid sturgeon may be present at the crossings of the Milk, Missouri, Yellowstone, and Platte rivers, because these river crossings would be crossed using the HDD method, there would likely be no effect on river bottom habitat for pallid sturgeon. The Niobrara River would also be crossed using HDD, although pallid sturgeon are not found there because of the downstream Spencer Dam.⁷

At streams and rivers crossed by the HDD method, a pump and hose would be placed in the waterbody to provide water to the HDD operation. The conservation measures listed above (see Section 3.2.4.3, Conservation Measures) restricting the times of year when water can be withdrawn would avoid the impingement and entrainment of free embryos and larval pallid sturgeon that drift with the current during that time of year. At other times of year, screening and floating the intake end and limiting the intake velocity would minimize impingement and/or entrainment of fish. In addition, spawning events near or upstream of the intake sites are very rare, as most of the documented spawning events in the Missouri, Yellowstone, and Platte rivers have occurred downstream of these sites. Considering the low likelihood of occurrence and the stated conservation measures, it is unlikely that the proposed water withdrawals would affect the eggs, larvae, or other life states of the pallid sturgeon.

The Missouri, Yellowstone, and Platte rivers have been identified as water sources to be used for pipeline hydrostatic testing. During this testing process, a pump would be placed in or adjacent to the river for the duration of the water intake and filling period. The conservation measures listed above regarding water withdrawal would also apply to withdrawals for hydrostatic testing. Care would be taken during the discharge to prevent erosion or scouring of the waterbody bed and banks to avoid effects on pallid sturgeon spawning habitat. Hydrostatic test water would be discharged in upland locations near the source of the water. Water would be discharged over several days and through a velocity reduction and erosion control device (see Section 8.4 in Appendix B, Construction, Mitigation, and Reclamation Plan).

Temporary withdrawals of water (e.g., for hydrostatic pipeline testing) have some potential for effects on potentially suitable habitat for this species. Withdrawals that lead to reduced instream flows can affect the composition of fish communities, raise average water temperature, and reduce normal channel-forming and bed-scouring hydraulic forces (Miller 2013; USFWS 2006, 2014d). However, implementation of conservation measures as outlined in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS would avoid or minimize noticeable reductions in instream flow; therefore, these effects, if any, would be insignificant and discountable. Specifically, only the volume of water needed will be withdrawn, withdrawals will be limited to less than 10 percent of daily base flow, and the water will be returned back to its source at the conclusion of hydrostatic testing. Furthermore, temporary effects on downstream water quality would also be avoided by the measures described in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS.

During droughts, surface water withdrawal permits from larger rivers with existing water rights (e.g., Platte River) would be regulated by state regulatory agencies to preserve existing water rights and environmental requirements. If inadequate water is available from rivers, Keystone would use alternative water sources nearby, such as local private wells or municipal sources for HDD

operations, hydrostatic testing, and dust control. Keystone has indicated that, in the event surface water is unavailable, groundwater would be used for HDD operations, hydrostatic testing, and dust control. Water would be purchased from nearby willing sellers and would not increase overall groundwater use.

During HDD activities, an accidental release of pressurized drilling mud from the borehole, or frac-out, could potentially occur. In some instances, the pressurized fluids and drilling lubricants may escape the active bore, migrate through the soils, and come to the surface at or near the construction site. Most leaks of HDD drilling fluids occur near the drill entry and exit locations and are quickly contained and cleaned up. Frac-outs that may release drilling fluids into aquatic environments are more difficult to contain primarily because bentonite readily disperses in flowing water and quickly settles in standing water. While the HDD method poses a small risk of frac-out, potential releases would be contained by BMPs that are described within the HDD contingency plans required for drilled crossings. These contingency plans are prepared by the pipeline contractor prior to construction. These practices include monitoring the HDD, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur. If a frac-out were to release fluids into an aquatic environment, consequences to the pallid sturgeon would be slight to nonexistent, because adult and larval pallid sturgeon prefer and may even be dependent on high turbidity levels (USFWS 2014d). Frac-out response activities could also result in short-term effects on aquatic resources. Frac-out response activities would likely increase local boat and human traffic, which could alter the existing aquatic habitat or disturb local flora and fauna.

Operations

Routine pipeline operations are not expected to affect the pallid sturgeon. According to Keystone's Pipeline Temperature Effects Study (Appendix E), the pipeline does have some effect on surrounding soil temperatures, but the burial depth under rivers crossed using HDD (i.e., greater than 25 feet below the river bottom) would avoid any temperature effects on river habitats.

Emergency repairs and other maintenance activities are not likely to result in effects on the pallid sturgeon. Although the frequency, location, and extent of such activities cannot be predicted with certainty, no effects on pallid sturgeon would be expected, as major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for HDD crossings. In the unlikely event that emergency repairs would be required at major river crossings, HDD methods would again be used and potentially suitable habitat for pallid sturgeon would be avoided.

Potential Spills

The likelihood of a spill occurring within the known range of the pallid sturgeon is shown in Table 3.2-7. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Therefore, the likelihood of spills occurring within suitable habitat for this species would be lower than that listed in Table 3.2-7.

Resource (Species Range)		Medium Spills per		Estimated Years Between Spills within
	Small Spills per Year	Year	Large Spills per Year	Species Range
Pallid Sturgeon	0.2	0.04	0.005	5.0

Table 3 2.7	Likelihood of Spills	Occurring within	the Range of the F	Pallid Sturgeon
1 abic 5.2-7	Likelihood of Spins	Occurring within	the Kange of the I	and Sturgeon

Any major river that could host pallid sturgeon at the planned crossing or downstream would be crossed using an HDD method that would result in a burial depth of 25 feet or more below the river bottom. In the event of a release, the crude oil would need to penetrate at least 25 feet of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and the potential for exposure. Additionally, as discussed above, these major river crossings are subject to an intensive integrity management program stipulated by the USDOT and require heavier wall pipe be used for the HDD method. As a result, it is highly unlikely that a release from the pipeline would occur coincident with these locations. Outside of HDD locations, the pipe would be standard thickness pipe and would be buried to the usual minimum depth (see Appendix C). Considering that proposed HDD entry and exit points are all more than 300 feet from major rivers and that a small spill is expected to spread radially no more than 150 feet (see Appendix C), it is expected that only a medium spill or larger could spread far enough to reach a major river; the likelihood of such a spill reaching a major river is estimated at approximately 0.004 times per year.

Spills or leaks may occur at or near crossings of tributaries of the rivers that could host pallid sturgeon, potentially leading to oil being transported downstream. However, direct toxicity and contamination in small, low-flow waterbodies would generally occur at the point of the release because of the inability of the waterbody to transport and dilute the contaminants. Some toxicity might persist in these streams for a few weeks or longer, until water washes out the toxic compounds trapped in the sediment or until cleaner sediment covers the contaminated sediment. In larger rivers, because of the large and rapid dilution of the oil relative to the flow volumes, the accumulation of oil or constituents sufficient to cause toxic effects would likely be limited to back eddies, calm water regions, and reservoir pools downstream of the release point.

If a significant release were to occur, federal and state laws would require cleanup. If the pipeline were transporting dilbit at the time of a release to a river, cleanup may require specialized methods, possibly including dredging, based on the tendency of dilbit to sink in water. Submerged dilbit could result in a persistent source of contamination because of the slow rate of natural degradation of this material. Thus, submerged dilbit could result in the slow release of dissolved hydrocarbons, resulting in long-term effects on organisms. Removal of submerged product from a river can be a difficult and long process, as observed in the response and cleanup efforts related to the July 2010 release in Marshall, Michigan, to the Kalamazoo River. Cleanup efforts to remove the submerged oil from that river, including dredging, excavation, and aeration, continued for 4 years after the spill (Parker 2014). Lighter or less viscous oils may spread more rapidly than dilbit, but may be more amenable to recovery and natural degradation.

In the unlikely event of a spill entering a river, exposure to crude oil could result in toxicological effects on pallid sturgeon. However, effects on pallid sturgeon are unlikely, due to the low probability of a spill entering an area where pallid sturgeon may occur, the rarity of sturgeon in

these areas, and the low probability of the spill reaching concentrations in sufficient amounts to cause toxic effects.

Power Infrastructure

The power line servicing PS-10 would cross the Milk River at three places within a meandering 0.85-mile stretch of river. Construction and operation of this line would involve no disturbance to the river and therefore would not affect the pallid sturgeon or its habitat. Power infrastructure for the proposed Project would have no effect on the pallid sturgeon because power lines would span all rivers and streams and no in-stream work would occur.

3.2.4.5. Cumulative Effects

The Proposed Federal Decisions could potentially have minor effects on the pallid sturgeon within its range in the Milk, Missouri, Yellowstone, and Platte Rivers due to the potential for impingement and entrainment during project-related water withdrawals.

Incremental effects on streams and riparian habitats from future non-federal pipeline projects, as well as other project types that have the potential to affect aquatic habitats, could result in cumulative effects to the pallid sturgeon as a result habitat degradation. Additionally, the accidental spread of aquatic invasive species could also increase cumulative effects on the pallid sturgeon. Introduced non-native species can compete with native species and transmit diseases that could adversely affect pallid sturgeon. Aquatic invasive species (either plant or animal) can be introduced into waterways and wetlands and can be spread by improperly cleaned vehicles and equipment operating in water, stream channels, or wetlands (Cowie and Robinson 2003; Fuller 2003). However, existing pipelines, active and abandoned mining sites, Williston basin oil and gas fields, and landfill sites in Montana, the Dakotas, and Nebraska are not noted to have had long-term effects on fisheries. Potential cumulative effects in the Platte River Basin are described in further detail in a programmatic Biological Opinion on the Platte River Recovery Implementation Program (USFWS 2006) and incorporated by reference, although the current action area is only a small portion of the area evaluated in that programmatic Biological Opinion.

Therefore, given the minor potential effects from the proposed Project and the limited additional effects from future non-federal projects, the proposed Project is not likely to contribute to cumulative effects in combination with any reasonably certain future activities within the action area.

3.2.4.6. Determination

Effect on the Species

The proposed Project and, therefore, the Proposed Federal Decisions "<u>may affect, but is not likely</u> <u>to adversely affect</u>" the pallid sturgeon. This determination is based on Keystone's plan to use the HDD crossing method for large rivers and Keystone's commitment to follow conservation measures, including restrictions on water withdrawals. None of the potential effects would occur on or near federal lands or waters, except possibly where the BLM and USACE are involved with the crossing of the Missouri River just below the Fort Peck Project. Although it is possible that a

spill event could result in effects on this species, such an effect would be unlikely, considering the low probability of a spill, the low probability of a spill in a river reach where pallid sturgeon are present, and the low probability of a spill reaching sufficient amounts to cause toxic effects. In the unlikely event of a leak, the crude oil would need to penetrate a significant amount of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and, therefore, the potential for exposure.

3.2.5. Topeka Shiner—Endangered

3.2.5.1. Natural History and Habitat Association

The Topeka shiner was federally listed as endangered on December 15, 1998 (Endangered and Threatened Wildlife and Plants; Final Rule To List the Topeka Shiner as Endangered, 63 Fed. Reg. 69008 [December 15, 1998]). The species' historical range overlaps Iowa, Kansas, Minnesota, Missouri, Nebraska, and South Dakota (USFWS 2018e). The adult population size of the Topeka shiner is unknown but probably exceeds 10,000 in total (IUCN 2014).

The Topeka shiner is normally found in slow-flowing, cool, clear, prairie creeks or spring-fed pools in larger streams. This species prefers pool-like areas that are outside the main channel courses, in contact with groundwater, and that contain vegetation and areas of exposed gravel. Typical substrates used by the Topeka shiner include gravel, rubble, sand, or bedrock with some silt. Insects make up their typical diet (e.g., midges, mayflies); other food items include plant matter, algae, and the eggs of other fish (NGPC 2012; USFWS 2018f).

Topeka shiners spawn from May into the summer, with males establishing and defending territories of approximately 1.6 feet in diameter. The lifespan of an individual Topeka shiner is approximately 3 years, and adults have a mean length of 1.4 inches, 1.7 inches, and 2.1 inches at ages 1, 2, and 3 years, respectively (NGPC 2012; USFWS 2018f).

USFWS has designated critical habitat for Topeka shiner in five different watersheds (Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Topeka Shiner, 69 Fed. Reg. 44735 [July 27, 2004]; Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Topeka Shiner, 70 Fed. Reg. 15239 [March 25, 2005]), including the Elkhorn River watershed in Madison County, Nebraska. Areas designated as critical habitat for the Topeka shiner are either occupied by the species or provide critical links between occupied habitats (USFWS 2014b). Within the Elkhorn River watershed, only one stream segment, a segment of Taylor Creek, was designated as critical habitat for Topeka Shiner.

Threats to this species include degradation of riparian corridors, gravel removal, vegetation clearing, stream channelization, groundwater withdrawals, and reduced flows. It is unknown whether the Topeka shiner is able to move between tributaries (i.e., tributary hop) to escape adverse conditions; however, it is generally believed that movement over long distances is not likely for this species. Key conservation measures for the Topeka shiner include maintaining hydrology and helping protect water quality (e.g., minimizing fertilizers, pesticides, sedimentation) within the watershed (NGPC 2012).

3.2.5.2. Potential Presence in Action Area

There is no potential for this species to occur in waters or near lands involved in the Proposed Federal Decisions, as the species does not occur in any counties containing waters involved in the Proposed Federal Decisions, with the potential exception of USACE actions as described below. However, the species may occur near other portions of the proposed Project.

In the general region surrounding the action area, the estimated current range of the Topeka shiner is very localized, limited to a portion of Madison (USFWS 2017b) and Stanton counties (NGPC 2011; NNHP 2019) in Nebraska. In this area, the MAR portion of the pipeline would pass through Union Creek and through several small tributaries in the Taylor Creek system. The MAR would not cross the designated critical habitat segment within Taylor Creek itself. A map showing the MAR, the Topeka shiner range, and Union Creek can be found in the 2018 MAR Draft SEIS as Figure 3.7-3 (Department 2018).

Surveys for the Topeka shiner were conducted on May 1, June 19, and August 2, 2018, to determine the fish species present within the portions of Union Creek and the Taylor Creek system crossed by the MAR (Keystone 2018a), whereas other streams were previously surveyed in 2013 (Appendix H, Special-Status Fish 2013 Survey, and Appendix I, Union Creek Topeka Shiner Survey Report). The Topeka shiner was not observed during any surveys. The surveys noted that Union Creek within this location is a degraded stream system that experiences rapid changes in flow and turbidity as a result of a surrounding landscape dedicated to intensive row cropping. The substrate was clay, which is not suitable habitat for this species. A review of fish community data over the decades indicates the community has become homogenized over time, and the possibility of the Topeka shiner residing in the stream at the pipeline crossing is considered highly remote (EcoCentrics and WESTECH 2018). Field visits to the proposed crossings of small tributaries of the Taylor Creek system, including North Taylor Creek, revealed that the habitat was degraded, and in some locations did not contain water (Keystone 2018a). Only one crossing intersected a perennial stream, and this feature was too small to support the Topeka shiner.

The USACE may issue verifications in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. PCNs are anticipated for other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

3.2.5.3. Conservation Measures

The limited movement ability of the Topeka shiner indicates that recent pre-construction surveys are likely to accurately reflect the presence or probable absence of Topeka shiners at a given location. Keystone will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the Topeka shiner and potentially suitable habitat for the species.

• Crossing of Union Creek will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater.

- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Pre-construction presence/probable absence surveys of Union and Taylor creeks will be completed during the year of construction.
- A dry crossing method or HDD will be used if the Topeka shiner is identified during preconstruction surveys.
- Keystone will ensure that water required for HDD operations or hydrostatic testing will be sourced from locations without Topeka shiner presence.
- Keystone will maintain at least a 100-foot setback from the water's edge for any HDD drill pads, should the HDD method be used.
- Keystone will implement BMPs outlined in the CMRP to prevent and minimize sediment runoff from construction areas from entering receiving streams that may provide potentially suitable Topeka shiner habitat.
- Broadcast applications of pesticides or herbicides will be avoided near water bodies.
- Keystone will avoid water depletions within occupied river basins.
- Upstream and downstream fish passage will be maintained during any stream habitat disturbance.
- The intake end of any water withdrawal pump will be screened with mesh having openings no larger than 0.125 inch. Water velocity at the screen will not exceed 0.5 feet per second, and the intake screens will be checked periodically for fish impingement. Should a Topeka shiner become impinged against the screen, all pumping operations will immediately cease and the compliance manager for Keystone will immediately contact the USFWS to determine if additional protection measures will be required. An environmental inspector will be present every day during water withdrawals to ensure compliance with permit conditions and to ensure that Keystone's commitments are met.

3.2.5.4. Effects of the Action

Pipeline Construction

The proposed pipeline construction is unlikely to affect the Topeka shiner or its habitat, primarily because none of the proposed pipeline corridor would encounter potentially suitable habitat.

All water withdrawals would be conducted consistent with permit requirements, and intake hoses would be screened to prevent entrainment of fish. Protections for aquatic life during water withdrawal for HDD would be implemented for all proposed water sources. All water withdrawals would be limited to less than 10 percent of the baseline daily flow. Construction timing considerations and BMPs for maintaining water quality and flow would reduce potential impacts on protected species. In addition, all planned water sources in are major streams and are generally unsuitable as habitat for the Topeka shiner.

The primary potential construction-related effects would be exposure to small fuel spills and leaks from construction machinery. Effects of construction-related spills would be unlikely, temporary, and minimal because all hazardous materials such as fuels and oils would be stored at least 100 feet away from surface waters, and these types of spills or leaks generally are small in volume and are cleaned up quickly. According to Keystone's CMRP, hazardous materials, chemicals, fuels, and lubricating oils would not be stored, staged, or transferred (other than possible refueling) within 100 feet of any waterbody or wetland.

In some instances, pressurized fluids and drilling lubricants used in the HDD process have the potential to escape the active HDD bore, migrate through the soils, and come to the surface at or near the crossing construction site, an event commonly known as a frac-out. Precautionary measures identified in a required HDD contingency plan would be implemented, including monitoring of the directional drill bore, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur. Keystone has developed an HDD contingency plan defining specific responsibilities, procedures, and actions necessary to manage the detection of and response to drilling fluid releases. As discussed above in Section 3.2.5.2, Union Creek at this crossing is a degraded stream system that experiences rapid changes in flow and turbidity as a result of a surrounding landscape dedicated to intensive row cropping; this area lacks suitable habitat and is considered highly unlikely to contain Topeka shiner. Frac-out response activities could involve increased local equipment activity and human traffic, which could alter the existing aquatic habitat and disturb local flora and fauna. However, the existing substrate is clay, similar to the bentonite clay that is the main component of drilling fluid, and neither Topeka shiner individuals nor suitable habitat appear to occur at the HDD location.

The proposed Project would implement the sediment and erosion control measures in Keystone's CMRP to avoid and minimize the potential effects of erosion and sedimentation. As discussed in Section 3.2.5.2, only one proposed crossing intersects a perennial stream, and photographs indicate that this feature is too small to convey any construction-related sediment the approximately 8.6 river miles downstream to the designated critical habitat in Taylor Creek (Keystone 2018a).

Operations

According to Keystone's Pipeline Temperature Effects Study (Appendix E), the proposed pipeline would have some effect on surrounding soil temperatures, primarily at pipeline depth. There is limited information on the effects of pipeline temperatures in relation to surface water and wildlife. Because the pipeline would be buried greater than 25 feet below the Union Creek bottom using the HDD method, temperature effects would be negligible. Crossings completed using techniques other than HDD would be buried less deeply, but not shallower than 4 feet, and would likely have only minor effects on the temperatures of creek waters or sediments (see Appendix E, Pipeline Temperature Effects Study).

Emergency repairs and other maintenance activities are not likely to affect the Topeka shiner. Regular maintenance activities would utilize the conservation measures and BMPs described above. However, emergency repairs may be completed at any time and using any equipment necessary to complete the repairs. Although the frequency, location, and extent of such activities cannot be predicted with certainty, no effects on Topeka shiner would be expected, as the species has not been documented in previous surveys and the habitat that is present at the proposed crossings is highly degraded. As described in the above conservation measures, additional surveys for the species will be conducted prior to initial construction. Should Topeka shiners be documented in the future, crossings of occupied habitat will occur via HDD or dry crossing methods.

Potential Spills

The likelihood of a spill occurring within the known range of the Topeka shiner is shown in Table 3.2-8. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Habitat surveys have been completed as described above; these found that suitable habitat for listed species was absent from the survey corridor within much of the species' known ranges. Therefore, the likelihood of spills occurring within suitable habitat for this species would be lower than that listed in Table 3.2-8.

Table 3.2-8	Likelihood of Spills	Occurring within the	Range of the Topeka Shi	ner
	1	0		

Resource (Species Range)		Medium Spills per		Estimated Years Between Spills within
	Small Spills per Year	Year	Large Spills per Year	Species Range
Topeka Shiner	0.03	0.005	0.0008	33.3

The Union Creek HDD crossing would result in a burial depth of 25 feet or more below the creek bottom. In the event of a release, the crude oil would need to penetrate at least 25 feet of overburden before reaching the river, thereby reducing the risk of crude oil reaching the creek and the potential for exposure. As a result, it is highly unlikely that a release from the pipeline would reach the creek at this location.

At planned crossings of tributaries in the Taylor Creek system, 2018 field surveys revealed that only five of the planned crossing locations contained water, only one was a perennial stream, and none contained Topeka shiner or suitable habitat (Keystone 2018a). The distances from these locations to Taylor Creek proper range from 3.51 river miles to 8.63 river miles (Keystone 2018a). Considering the low flow rates evident in photographs from field surveys (Keystone 2018a), it is unlikely that a spill occurring at any of these locations would reach the habitat in Taylor Creek before being contained by emergency response actions described in Appendix C; considering this along with the low probability of a spill occurring anywhere within the range of this species, it is highly unlikely that a release from the pipeline would coincide with the presence of Topeka shiner individuals or suitable habitat.

If a significant release were to occur, federal and state laws would require cleanup. If the pipeline were transporting dilbit at the time of a release to a river, cleanup may require specialized methods, possibly including dredging, based on the tendency of dilbit to sink in water. Submerged dilbit could result in a persistent source of contamination because of the slow rate of natural degradation of this material. Thus, submerged dilbit could result in the slow release of dissolved hydrocarbons, resulting in long-term effects on organisms. Removal of submerged product from a stream can be a difficult and long process, as observed in the response and cleanup efforts related to the July

2010 release in Marshall, Michigan, to the Kalamazoo River. Cleanup efforts to remove the submerged oil from that river, including dredging, excavation, and aeration, continued for 4 years after the spill (Parker 2014). Lighter or less viscous oils may spread more rapidly than dilbit, but may be more amenable to recovery and natural degradation.

Direct contact with a crude oil spill could result in effects on Topeka shiners due to oiling of individuals or eggs or oil ingestion from consumption of contaminated prey. While these exposure routes have the potential to cause effects on individuals, the likelihood of effects on the Topeka shiner is very low, considering the low probability of a spill and the low probability of the spill coinciding with the presence of Topeka shiner individuals or suitable habitat.

Power Infrastructure

There is no proposed electrical infrastructure within the range of the Topeka shiner. Therefore, the proposed power infrastructure would not affect the Topeka shiner or its habitat.

3.2.5.5. Cumulative Effects

The proposed Federal Decisions have the potential to result in temporary effects on the Topeka shiner within its range in Nebraska, if present in the action area. However, effects, if any, are highly unlikely to occur given the general lack of known occurrences and the lack of potentially suitable habitat for the species within the action area.

Incremental effects on streams and riparian habitats from future non-federal pipeline projects, as well as other project types that have the potential to affect aquatic habitats, could result in cumulative effects to the Topeka shiner as a result habitat degradation. Additionally, the accidental spread of aquatic invasive species could also increase cumulative effects on the pallid sturgeon. Introduced non-native species can compete with native species and transmit diseases that could adversely affect Topeka shiner. Aquatic invasive species (either plant or animal) can be introduced into waterways and wetlands and can be spread by improperly cleaned vehicles and equipment operating in water, stream channels, or wetlands (Cowie and Robinson 2003; Fuller 2003). However, existing pipelines, active and abandoned mining sites, Williston basin oil and gas fields, and landfill sites in Montana, the Dakotas, and Nebraska are not noted to have had long-term effects on fisheries. Additional potential cumulative effects in the Platte River Basin are described in further detail in a programmatic Biological Opinion on the Platte River Recovery Implementation Program (USFWS 2006) and incorporated by reference, although the current action area is only a small portion of the area evaluated in that programmatic Biological Opinion.

Therefore, based on the temporary and unlikely effects of the proposed Project and the limited effects from future, non-federal projects, the proposed Project is not likely to contribute to cumulative effects in combination with any reasonably certain future activities within the action area.

3.2.5.6. Determination

Effect on Critical Habitat

USFWS has designated critical habitat for Topeka shiner in, among other places, a segment of Taylor Creek from where it flows into T22N, R2W, Sec. 22 to its confluence with Union Creek in Madison County, Nebraska (Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for the Topeka Shiner, 69 Fed. Reg. 44735 [July 27, 2004]; Endangered and Threatened Wildlife and Plants; Final Designation of Critical Habitat for Topeka Shiner, 70 Fed. Reg. 15239 [March 25, 2005]).

The proposed Project would cross ten mapped tributaries to Taylor Creek; however, it would not cross any part of Taylor Creek proper, including the portion designated as critical habitat. Field surveys on May 1, 2018, found that none of the crossings of the tributaries to Taylor Creek were suitable habitat for the Topeka Shiner. In fact, four of the ten mapped crossings, including what is supposed to be North Taylor Creek, were found to be dry portions of agricultural fields with no discernable stream present (Keystone 2018a). None of these crossings would require HDD or dry crossing to avoid sedimentation or other effects on Topeka shiner habitat.

Therefore, the proposed Project would have no effect on critical habitat for the Topeka shiner.

Effect on Species

The proposed Project and, therefore, the Proposed Federal Decisions "<u>may affect, but is not likely</u> <u>to adversely affect</u>" the Topeka shiner. However, no effects are anticipated on federal lands. This determination is based on Keystone's commitment to conduct pre-construction surveys and avoid effects on individuals within occupied streams. Although it is possible that a spill event could result in temporary effects on this species, the probability of effects on the Topeka shiner is low, due to the low probability of a spill, the likelihood that most spills would be very small in size, and the very low probability of the spill coinciding with the presence of individual Topeka shiners.

3.2.6. American Burying Beetle—Endangered

3.2.6.1. Natural History and Habitat Association

The American burying beetle was federally listed as endangered on July 13, 1989 (Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle, 54 Fed. Reg. 133 [July 13, 1989]). The American burying beetle has historically been recorded in 35 states in the eastern and central United States. Populations declined from the 1920s to the 1960s and the American burying beetle is currently found only in a small portion of its former range. In 1983 the American burying beetle was included as an endangered species in the Invertebrate Red Book published by the International Union for the Conservation of Nature (ENSR 2008). No critical habitat has been designated for this species. The USFWS has recently completed a species status assessment for the American burying beetle (USFWS 2019f) and has proposed downlisting this species from endangered to threatened (84 Fed. Reg. 19013).

The American burying beetle is the largest carrion-feeding insect in North America reaching a length of about 1.6 inches and a weight of up to 0.1 ounce. Like other carrion beetles, American burying beetles search the environment for fresh carcasses, which they use for feeding and rearing of offspring (Milne and Milne 1976; USFWS 2012). During the daytime, American burying beetles are believed to bury under the vegetation litter to avoid desiccation and predators.

Considering the broad geographic range formerly occupied by the American burying beetle, it is unlikely that vegetation or soil type were historically limiting. Unlike other burying beetles, no strong correlation with vegetation or soil type seems to exist, but it strongly prefers moist soils (Creighton et al. 1993; Hoback 2016; Jurzenski et al. 2011). There is a strong negative association between the presence of this species and cultivated croplands (Leasure and Hoback 2017). American burying beetles appear to decline in response to habitat fragmentation and increases in row crop agriculture (Bishop et al. 2002). There are no comprehensive life history studies that provide information on exactly where beetles overwinter (depth in soil, whether frozen or unfrozen locations used) or the exact cues for American burying beetle emergence from the ground (soil temperature, soil moisture, combinations, other). The species has been found in mesic areas such as wet meadows, streams, and wetlands in association with relatively undisturbed semi-arid, sandhill, and loam grasslands. Such areas often, but not always, have a thick stand of grassland vegetation with some woody vegetation. No critical habitat has been designated for this species.

Based on their historical wide ranging distribution and occurrence in northern states where soil temperatures decline to below freezing during winter, Dr. Wyatt Hoback, who has studied the American burying beetle for more than 10 years, considers that American burying beetles likely have adapted an overwinter survival strategy that requires either freezing or cooling to very near freezing that slows metabolism to a point that fat reserves are sufficient to last over winter until emergence in late May or early June. Hoback and Conley (2014) studied a related species, *N. orbicollis*, in Nebraska and found that overwintering beetles moved up and down within the soil based on temperature, mostly residing just below the frost line.

The primary causes for the decline of the American burying beetle are thought to be pesticide use and habitat loss, degradation, and fragmentation, which correspond to a decrease in the availability of suitable carrion (Bedick et al. 1999; Jurzenski 2012). Developed land and land that has been converted to agricultural, grazing, and other uses often favors scavenging mammals and birds that compete with carrion beetles for carrion. Additionally, these types of habitat alterations have generally led to declines in ground nesting birds, which probably historically provided a large portion of the carrion available.

Climate change may also present a substantial risk to the resiliency of this species, through higher temperatures and drier conditions (USFWS 2019f). The USFWS (2019f) analyzed two future climate scenarios: high and moderate emissions levels. Under the high emissions levels scenario, American burying beetle populations in the Southern Plains and Northern Plains analysis areas, which include the action area, were all predicted to be extirpated under the high emissions level of climate change by 2070-2099. With moderate emissions levels of climate change, the viability of the species would potentially be limited to northern analysis areas in Nebraska, South Dakota, New England, and possibly reintroductions in Ohio. However, the Sand Hills would be the only high resiliency population

remaining, and the Niobrara River population may be the only moderate resiliency population by 2070-2099 (USFWS 2019f).

Fire suppression in prairie habitats allows the encroachment of woody plant species, particularly the eastern red cedar (*Juniperus virginiana*), which is thought to degrade habitat for burying beetles by limiting their range to forage for carrion. The red imported fire ant (*Solenopsis invicta*), which has extended its range in the southeastern and south central United States and is most numerous in open, disturbed habitat, has also been identified as a cause for the decline of the American burying beetle (USFWS 2008a).

Like other carrion beetles, American burying beetles search the environment for fresh carcasses which they use for feeding and rearing of offspring. Because carrion is a typically limited resource, the discovery of a carcass often occurs within 2 days, but has been reported to occur as quickly as 35 minutes post-death (Milne and Milne 1976). Usually, multiple individuals comprising several species discover the carcass. As the beetles arrive at the carcass, a fierce competition erupts. This competition can lead to damage to beetles including loss of legs, antennae, and even mortality (Bedick et al. 1999).

If the carcass is fresh and is of appropriate size, competition ensues until there is only a single beetle pair occupying the carcass. This pair is generally the largest male and female of the largest species that discovered the carcass with the other beetles either being driven away or being wounded by the victorious pair and not surviving (Wilson and Fudge 1984). The victorious pair will then work cooperatively to quickly entomb the acquired carcass. This behavior seems to have evolved out of necessity to remove the carcass from the realm of discovery by other invertebrate burying beetles as well as vertebrate scavengers. Studies have demonstrated that there is an intense competition between flies and ants for the resources present in the carcass (Scott 1998). If flies discover and reproduce on the carcass before burying beetles arrive, the developing fly larvae can quickly consume all the nutrients within the carcass is discovered by ants, adult beetles must defend the carcass and sometimes become victims of aggressive ant colonies (Ratcliffe 1996).

After finding a suitable burial locality, the parental beetles will begin plowing under the carcass creating a compacted depression that will become the final resting place for the carcass. As the carcass falls into the depression through the action of gravity, it is forced into a tight ball by the beetles. The carcass is further molded into a tight ball as the beetles move over the carcass and remove the fur or feathers (Milne and Milne 1976).

3.2.6.2. Potential Presence in Action Area

The American burying beetle occurs in South Dakota and Nebraska, but it does not occur in North Dakota or Montana. Figure 3.2-7 and Figure 3.2-8 show the results of two recent models of American burying beetle distribution. In Nebraska, the American burying beetle has been observed from April 1 to October 29, with peak periods of activity extending from June through August. Generally, July is a time when adults go underground to reproduce and cannot be captured during surveys.

The proposed Project includes approximately 596 miles of pipeline and approximately 271 miles of electric power lines through South Dakota and Nebraska. Reconnaissance surveys of habitat suitability

along the pipeline ROW within South Dakota and Nebraska were conducted from 2008 to 2012, and in 2014, 2016, and 2018, and habitat was rated based on the Nebraska habitat rating system, which reflects the potential for American burying beetle occurrence based on general habitat characteristics (Hoback 2010, 2012; Figure 3.2-9). The entire proposed Project ROW and off-ROW work areas such as construction yards, construction camps, pump stations, and pipe yards were rated using this system where they fell within the range of the American burying beetle.



Note that this model extends beyond the edge of the displayed image.





Note: The probability bin cutoffs are different from Figure 3.2-7. This model is limited to the spatial boundaries displayed.

Figure 3.2-8 Predicted Distribution of American Burying Beetle near the Proposed Project, as Modeled by Jenkins et al. (2018)



Figure 3.2-9 American Burying Beetle Habitat Ratings in South Dakota and Nebraska

The following habitat rating criteria were used in Nebraska and South Dakota where field reconnaissance was performed in 2013 and/or 2018:

- 5. *Prime:* Undeveloped wet meadows with some trees, especially cottonwoods (*Populus deltoides*), or forest areas visible. Water sources are available including the presence of a river, stream, or sub-irrigated soils (water is close to the surface as a result of shallow aquifer). Cropland is not visible within the mile segment, or is more than 2 miles away.
- 4. *Good:* Native grassland species (tall or mixed grass prairie) with forbs. Low wetland meadows that are grazed by cattle or used for haying. Trees, usually cottonwoods, present. Sources of water are within 1 mile, but the area has either some cropland or sources of light pollution including yard lights, or houses within 1 mile.
- 3. *Fair:* Grassland with exotic species such as brome grass (*Bromus* spp.). Soil moisture content is lower than for prime or good habitat. Row crop agriculture is located within 1 mile.
- 2. *Marginal:* Potential habitat restricted to one side of the ROW, with row crop agriculture on one side or dry, sandy, upland areas with exposed soil and scattered dry-adapted plants such as yucca (*Yucca* spp.).
- 1. *Poor:* Both sides of the ROW with row crop agriculture or habitat with the potential for large amounts of light pollution and disturbance associated with town or city edge.

New locations within the proposed Project footprint that were added after the 2018 field surveys were rated for habitat quality based on high-resolution satellite imagery using the following criteria (Appendix W, American Burying Beetle Sampling Report June 2019):

- 5. *Prime:* Low wetland meadows dotted with old growth cottonwoods. Sub-irrigated, well-watered soils. Little or no cropland visible.
- 4. *Good:* Possesses some "Prime" characteristics. Presence of cropland or several sources of light pollution. Distance from a shoreline.
- 3. *Fair:* Savannah type habitat interspersed with row crop agriculture. Agriculture located within 2 miles of either side of habitat.
- 2. *Marginal:* Predominantly agriculture-impacted or dry upland areas.
- 1. *Poor:* Low-lying grassland. Heavily cropped. Areas of blowout and floodplain. Potential for excessive light pollution.

South Dakota

The American burying beetle is found in South Dakota in Tripp, Todd, Bennett, and Gregory counties; the proposed Project does not enter Todd or Bennett counties. American burying beetles have been collected in the 1990s from Todd, Tripp, and Gregory counties (Backlund and Marrone 1997). More recent data are only available from Tripp and Gregory counties. Surveys in 2005 unrelated to the proposed Project revealed that American burying beetles are concentrated in Tripp County, where the population is estimated to be approximately 1,000 individuals in an area of approximately 54,363 acres (Backlund et al. 2008). Surveys in southwestern Gregory County in

2019 unrelated to the proposed Project captured American burying beetles at two sites more than 2 miles from the proposed Project, but the other six valid trap sites did not capture American burying beetles; the data indicate that the population density in Gregory County may be less than in Tripp County (Hoback 2019).

Sampling Results

Intensive sampling in and near a portion of the action area was conducted in 2019 in Tripp County. Sampling in 2019 occurred in June (Appendix W, American Burying Beetle Sampling Report June 2019) and August (Appendix X, American Burying Beetle Sampling Report, Tripp County, South Dakota, August, 2019). In June, 19 out of 28 traps captured one or more American burying beetle, resulting in a total of 120 individuals captured at least once. This indicates that the American burying beetle occurs in relatively high densities. In August, 17 out of 30 traps captured a total of 42 American burying beetles. Of these, 22 were post-reproductive and 20 were young adults. Weather conditions for trapping were suitable, but numbers of individuals captured were lower than in June, possibly because of abnormally high rainfall during the breeding season. Seven trap sites that were occupied in June revealed no individuals in August, whereas three trap sites captured individuals in August but not in June. The American burying beetle was detected at 23 of 30 trap sites in at least 1 month (Figure 3.2-13). No individuals were captured in either month at the northernmost trap site, approximately 4 miles south of the town of Winner.

Habitat Suitability

Modeling by Jenkins et al. (2018) suggested that the American burying beetle is most likely to occur in relatively undisturbed sites in the loess prairie ecoregion in southern Tripp County. Jenkins et al. (2018) surveyed for this species in 2014, 2016, and 2018 in an attempt to define the northern and western limits of its current occupied range. The results of the surveys and subsequent modeling showed that the population in South Dakota continues to occupy central and southern Tripp County. To the east of Tripp County, expanding agriculture has rendered the region less suitable for the American burying beetle.

The best habitat for the burying beetles in South Dakota is similar to that for the northern Nebraska population and consists of wet meadows in sandy soils with scattered cottonwoods trees. The habitat quality ratings from 2013 have been re-analyzed in 2018, or, for some locations, 2019, to reflect current conditions. A summary of the current habitat ratings is shown in Table 3.2-9. The re-analysis revealed a substantial decrease in suitable habitat in the proposed pipeline corridor in South Dakota, mostly resulting from increased development of agriculture (e.g., center-pivot corn fields). Although in 2013, 22 miles of pipeline ROW were prime habitat, only 4 miles of pipeline ROW were prime habitat in 2018/2019. New agricultural developments near the ROW have reduced the habitat ratings to fair, marginal, or poor. Neither the route in South Dakota nor the rating scale has changed.

Year	County	Prime (miles)	Good (miles)	Fair (miles)	Marginal (miles)
2013	Tripp	25	8	0	2
2018/2019	Tripp	4	12	10	5

Table 3.2-9Suitability Ratings of American Burying Beetle Habitat along Proposed
Pipeline in South Dakota

The proposed Project pipeline in South Dakota would cross approximately 4 miles of prime habitat, 12 miles of good habitat, 10 miles of fair habitat, and 4 miles of marginal habitat. American burying beetles are unlikely to occur in marginal habitat and are considered absent from poor habitat.

Two proposed electric power lines to pump stations in South Dakota are within range of the American burying beetle, those to PS-20 and PS-21. The power line to PS-20 would lie in the northwest corner of Tripp County, mostly outside of the current range of this species. While recent surveys not associated with the proposed Project (Jenkins et al. 2018) captured American burying beetles in central Tripp County south of the town of Winner, no traps were set in the northwestern part of the county. Results of only four trap sites to the north and west of Winner have been reported, none of which captured American burying beetles (Backlund et al. 2008). Therefore, the power line to PS-20 is assumed to overlap the occupied range of this species only to the south of U.S. Route 18. This power line would be approximately 20.5 miles long, but only approximately 2.7 miles would lie within the range of the species, within which the approximately 16.5 acres of ROW were rated as marginal habitat (Appendix W, American Burying Beetle Sampling Report June 2019).

The ROW for the power line to PS-21 would overlap approximately 56 acres of prime, 47 acres of good, 17 acres of fair, and 5 acres of marginal habitat (see Table 3.2-10). No portion of the line overlaps unsuitable ("poor") habitat or extends beyond an 18.6-mile buffer around all known capture locations since 2001 (USFWS 2019f); however, the northern portion of the line, as well as the proposed rebuild of WAPA's Gregory substation, would lie outside of the likely occupied range of this species based on habitat modeling (see Figures 3.2-7 and 3.2-8) (SDNHP 2019; Leasure and Hoback 2017; Jenkins et al. 2018). WAPA's substation rebuild would occur within approximately 6 acres of marginal habitat, but outside the likely occupied range of the species.

Table 3.2-10Suitability Ratings of American Burying Beetle Habitat in South Dakota along
Power Line to PS-21

County	Mile	Prime	Good	Fair	Marginal
Gregory	0				\mathbf{X}^{*}
Gregory	1			\mathbf{X}^*	
Gregory	2			\mathbf{X}^*	
Gregory	3			\mathbf{X}^*	
Gregory	4		X *		
Gregory	5		X *		
Gregory	6		X *		
Gregory	7		X *		

County	Mile	Prime	Good	Fair	Marginal
Gregory	8		X *		
Gregory	9	X			
Gregory	10		X		
Gregory	11	X			
Gregory	12		X		
Gregory	13		X		
Gregory	14	X			
Gregory	15	X			
Gregory	16	X			
Gregory	17	X			
Tripp	18	X			
Tripp	19	X			
Tripp	20.54	X			
Total Miles	•	8.54	$3 + 5^*$	3*	1*

* = outside of the likely current occupied range of the species

Nebraska

In Nebraska, American burying beetle populations are known to occur in Blaine, Boone, Brown, Cherry, Custer, Dawson, Frontier, Gasper, Holt, Keya Paha, Lincoln, Loup, Rock, Thomas, Valley, and Wheeler counties, and may occur elsewhere in Nebraska (Figure 3.2-7 and Figure 3.2-8). NNHP reports documented occurrences in Boyd, Holt, Keya Paha, and Rock counties (2019). Most of the American burying beetles in Nebraska are concentrated in the Sand Hills region. However, the proposed Project avoids the Sand Hills region. In addition, recent sampling has failed to detect this species anywhere along the MAR or in Antelope County. Therefore, the proposed Project overlaps the range of this species in Nebraska only within Keya Paha, Boyd, and Holt counties.

In Nebraska, the USACE may issue verifications under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. PCNs are anticipated for other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

Sampling Results

Intensive sampling in and near the Nebraska portion of the action area was conducted in 2012, 2018, and 2019.

During the summer of 2012, American burying beetle surveys were conducted at 54 sites in northern Keya Paha, Holt, Antelope, and Boyd counties (Hoback 2012). Surveys occurred between August 2 and August 17, 2012, using standard traps baited and checked for five trap-nights

following USFWS and NGPC approved survey methods. Traps were set on road shoulders of state and county highways within suitable habitat.

During August 2012 surveys, American burying beetles were found in Holt and Keya Paha counties (Appendix J, 2012 Results of Survey for American Burying Beetle, *Nicrophorus americanus*, in Northern Keya Paha, Western Boyd, Eastern Holt, and Antelope Counties). No American burying beetles were found in Boyd or Antelope counties. In Keya Paha County, American burying beetles were found at nine locations of 14 new sites surveyed. In Holt County, American burying beetles were found at 19 new sites of 29 sites surveyed (Figure 3.2-10 and Figure 3.2-11). Capture rates ranged from 0 to 2.8 American burying beetles per trap-night (Hoback 2012). Because burying beetles are susceptible to desiccation (drying out) (Bedick et. al 2006), capture rates are likely to have been affected by the drought in Nebraska during summer 2012; American burying beetle abundance in these counties may have been higher under normal weather conditions, although control trap results do not suggest this.

Control traps were deployed during sampling at sites in Holt County, where American burying beetles were known to be numerous. These traps produced between 0.7 and 7.0 American burying beetles per trap-night (Hoback 2012). The control trap success suggests that populations of American burying beetles to the east of the NDEQ-identified Sand Hills Region are not as dense as populations that occur in the Sand Hills.


Figure 3.2-10 Results of 2012 Sampling for the American Burying Beetle



Note: Prior to 2010, trapping protocol required trapping for three trap-nights, which changed to five trap-nights in 2010.

Figure 3.2-11 Trap Data (1999–2012) where American Burying Beetle per Trap-Night for Three Trap-Nights are Plotted (with a 5-mile Buffer) as an Estimate of American Burying Beetle Density

Overall, few American burying beetles were captured in 2012 surveys compared to control sites at the same time that had much higher captures (Hoback 2012). A positive control establishes that conditions were appropriate in a given geographic area and that American burying beetles were active during the timeframe of trapping. Drought conditions causing low soil moisture may have affected the number of American burying beetles caught in 2012 surveys, but control traps did not support that conclusion. Habitat quality and availability appears to be a more important indicator of beetle abundance compared to soil moisture.

Sampling was not conducted in 2013, although habitat was evaluated at additional sites (Appendix K, 2013 Evaluation of Auxiliary Sites in Tripp County, South Dakota, for American Burying Beetle Habitat).

Sampling in June and August 2018 did not detect any American burying beetle in southeastern Holt County, anywhere in Antelope County, or elsewhere along the MAR (Figure 3.2-12). (See Appendix L, American Burying Beetle Survey Report Nebraska Mainline Alternative Route; and Appendix M, American Burying Beetle Sampling Report August 2018.) Habitat changes from pasture to row crop agriculture appear to have eliminated the species from near the MAR ROW and it is unlikely that it will re-colonize because of the extent of habitat modification and availability of carrion resources. Field reports by Dr. Wyatt Hoback filed with the USFWS contain additional information. The counties in which captures of American burying beetle occurred were Keya Paha, Boyd, and Holt counties.

In Keya Paha County, four traps set on the pipeline ROW in June and August 2018 did not capture American burying beetle. An additional seven traps set in apparently high quality habitat also did not catch American burying beetle. One trap caught two American burying beetles in June but produced none in August. This trap is approximately 6 miles from the proposed pipeline ROW and is near water. In general, soils along the ROW are of poor quality, with higher clay content. Most of these areas are drier and upland of water sources.

In Boyd County, the pipeline route passes through the southwestern corner of the county. A number of recent sampling events have been conducted in Boyd County, and American burying beetles have been detected at four locations within the past 10 years. Three of the positive locations are near the Keystone ROW. However, the area has been developed between 2016 and 2018 with the addition of a number of center pivots. In 2018 sampling, no American burying beetles were detected in Boyd County in June or August, and habitats were rated as marginal to fair.

In Holt County, the American burying beetle occurs in low to moderate abundance along portions of the pipeline ROW. The American burying beetle occurs most frequently in the northwestern area of the county and in a small undeveloped south-central area, but has been eliminated from the remaining areas of Holt County where the pipeline ROW traverses agricultural land. Center pivot agriculture has rendered habitat less suitable for the American burying beetle. American burying beetle capture rates during the June and August 2018 sampling ranged from 0 to 1.4 American burying beetles per trap-night.

Sampling in 2019 occurred in June (Appendix W, American Burying Beetle Sampling Report June 2019). In June, 23 out of 43 traps captured one or more American burying beetle (Figure 3.2-13).

Results indicate that American burying beetles continue to occur at low densities along the proposed pipeline ROW, more so in Holt County than in Boyd and Keya Paha counties. In Boyd and Keya Paha counties, only 5 out of 14 traps captured any American burying beetles, whereas in Holt County, 20 out of 29 traps in or near the action area captured American burying beetles. The areas of highest density are associated with canyons that have native grasses and access to water. One individual was captured at the proposed pipe yard area near Hay Valley Road and State Highway 137 in Keya Paha County. Row crop agriculture, including center-pivot irrigated agriculture, may be limiting American burying beetle occurrence in Holt County.



Figure 3.2-12 Results of 2018 Sampling for American Burying Beetle



Figure 3.2-13 Results of 2019 Sampling for American Burying Beetle

Habitat Suitability

Suitability ratings of American burying beetle habitat crossed by the proposed Project in Nebraska are summarized in Table 3.2-11 and shown on Figure 3.2-9. As shown in Table 3.2-11 below, the adjusted proposed pipeline route in Nebraska would cross approximately 26 miles of prime habitat, 13 miles of good habitat, 1 mile of fair habitat, and 5 miles of marginal habitat. Unlike in South Dakota, expansion of intensive agriculture near the proposed pipeline has been much slower in Nebraska, because much of the land suitable for such uses was already under intensive cultivation by 2012; therefore, habitat reevaluation was not necessary except in areas not previously rated (Appendix W, American Burying Beetle Sampling Report June 2019).

 Table 3.2-11
 Suitability Ratings of American Burying Beetle Habitat along Proposed

 Pipeline in Nebraska

County	Prime (miles)	Good (miles)	Fair (miles)	Marginal (miles)	Total Habitat (miles)
Keya Paha	14.8	2.8	0.0	0.0	17.6
Boyd	1.7	3.0	0.0	2.1	6.8
Holt	9.8	7.5	1.0	3.2	21.5
Total Miles	26.3	13.3	1.0	5.3	45.9

Habitat along the MAR was not rated because the American burying beetle does not occur in those portions of Nebraska (exp and Hoback 2018).

Of the necessary new electrical power lines and substation in Nebraska, only the one serving PS-22 would occur within the current occupied range of the American burying beetle. Trapping efforts in 2012, 2018, and 2019 confirmed the presence of the American burying beetle at the trap sites closest to PS-22. The power line that would serve PS-22 would cross approximately 1 mile of marginal habitat and 1.5 miles rated poor (Table 3.2-12). Although this ROW would likely be 100 feet wide legally, an existing public road and associated road ROW would lie within the power line ROW, thus reducing the true area of potential effect. The proposed switching station, which would be constructed, owned, and operated by the local power providers, is assumed to occupy approximately 3.5 acres, and would be situated in marginal habitat.

Table 3.2-12Suitability Ratings of American Burying Beetle Habitat in Nebraska along
Power Line to PS-22

County	MP	Prime	Good	Fair	Marginal	Poor
Holt	0					Х
Holt	1				Х	
Holt	2.5					Х
Total Miles		0	0	0	1	1.5

MP = milepost

The next closest pump station, PS-23, and its associated power line in Antelope County would be located in an area heavily developed for agriculture and outside of the occupied range of the American burying beetle (Leasure and Hoback 2017; Jenkins et al. 2018).

3.2.6.3. Conservation Measures

Keystone, the electrical power providers, or WAPA, where specified, will apply the following conservation measures to the extent practicable and allowed by landowners to avoid, minimize, and mitigate effects on the American burying beetle and potentially suitable habitat for the species.

- Mowing: The purpose of mowing construction areas is to ensure that the American burying beetle is not attracted to the active construction site. Mowing occurs when the American burying beetle is active, so depending on the ground disturbance timeframe, the period when these procedures will be implemented is from March 15 through October 31, based on NGPC guidance. NGPC recommends moving construction areas 2 weeks prior to the commencement of ground disturbing activities between these dates. For winter construction activities (October 31 to March 31) mowing would occur by October 15. Mowing and raking away grass clippings allows the ground to dry out. Willemssens (2015) conducted numerous experimental tests and found burying beetles were significantly less likely to bury in construction zones and concluded that mowing as a pre-work conservation measure should reduce the number of American burying beetles present. In accordance with NGPC guidance, construction areas will be mowed such that the vegetation is as low as possible without causing erosion (less than 8 inches). Hand clearing or mechanical mowing will be used to mow uplands. Forested uplands will not be cleared ahead of mainline construction and wetlands and streams will also be avoided. This short vegetation height will be maintained for the duration of active construction during the American burying beetle overall active period (until October 31) or until construction in the vicinity is completed, whichever is earlier. Mowing will be completed every 2 weeks, if necessary, to ensure vegetation is kept less than 8 inches tall until grading commences. Once mowed, clippings will be removed. Possible methods include raking, windrowing, or baling. If the grass has stopped growing, or grading commences, mowing can stop. All construction, work vehicles, and personal vehicles will be staged in mowed areas. If it is not possible to maintain vegetation under 8 inches in height, construction will avoid such areas until the vegetation can be mowed to less than 8 inches in height. For power line construction in potentially suitable American burying beetle habitat, mowing will be done only in construction areas with soil disturbance (pole installation), as recommended by the USFWS and NGPC. Once moving procedures have been initiated, weekly reports will be kept and submitted to USFWS, NGPC, and SDGFP. These reports will demonstrate that the conservation measures are being implemented and become part of the records. Weekly reports are only required during the American burying beetle active period (April 1 to October 31) while construction on the Project is active. Photos documenting grass heights will be provided.
- Carrion removal: Removing carrion (essential for American burying beetle feeding and reproduction) will make the work area less attractive to the American burying beetle. By removing carrion in areas where construction would occur, this ensures that American burying beetle would not be feeding or burying carcasses in an area where they could encounter construction equipment. In accordance with NGPC guidance, the work area will be prepared by removing any and all carcasses prior to construction. Carcasses as small as songbirds, snakes, and rodents are ideal food for the American burying beetle; therefore, this removal activity will be thorough. Carcass removal will occur between March 15 and October 31 or

until construction is completed, whichever is earlier. Personnel will survey the ROW daily to remove carrion. Carcass removal can be done at any time throughout the day; however, the preferred timing is in the late afternoon, since the American burying beetle is active at night. This will ensure that American burying beetles are not drawn to the area by roadkill caused by daytime traffic. Disposal of carcasses will be at least 0.5 miles away from the work site. For power line construction in potentially suitable American burying beetle habitat, carrion removal will be done only in construction areas with soil disturbance (pole installation), as recommended by the USFWS and NGPC. Carrion removal reports will be submitted as with the mowing reports. Once carrion removal procedures have been initiated, weekly reports will be kept and submitted to USFWS, NGPC, and SDGFP, as well as the designated Environmental Inspector for filing. These reports demonstrate that the conservation measures are being implemented and become part of the records. Weekly reports are only required during the American burying beetle active period (April 1 to October 31) while construction on the Project is active. If the number and species of carrion can be easily identified (for example, deer carcass, bull snake, mouse, etc.), this information will be included in the report. Photo documentation of carrion removed will be provided.

- During the construction phase, most construction activity will take place in daylight hours. Construction activities taking place at night would require artificial lighting and could thereby have an effect on American burying beetle by disruption of normal behavior patterns. Construction at night and the use of lights will be limited to specific situations requiring this activity such as critical tie-ins, HDDs, and during certain weather conditions. Where such activities require lighting, the lights will be down shielded and utilize warm amber-colored lights with a color temperature of 3000 K or less and intensity no greater than 70,000 lumens. Lighting required for contractor yards and pump stations will also be down shielded, except where required for safety and security, and will utilize sodium vapor or LED lighting meeting the above specifications.
- Keystone will implement an education program for construction personnel engaged in the proposed Project. This will include a presentation focused on identifying the American burying beetle, explaining its life history, its current range, and its habitat requirements. Construction personnel will be instructed to report any sightings of American burying beetle or brood chambers if encountered. Education cards will be provided to all construction personnel. Signs will be placed at construction entrances identifying the area as potential American burying beetle habitat.
- Immediately following construction, disturbed areas will be ripped to a depth of 24 inches to relieve soil compaction existing at the site from the use of heavy equipment. This effort will improve or enhance American burying beetle habitat by making soils easier for beetles to bury in. Keystone's CMRP provides further details with regard to relief of soil compaction within ROWs following construction.
- Erosion control techniques such as silt fencing, hay bales, water bars, and other efforts will be used to prevent washing away of topsoil, formation of gullies, or other erosion that could negatively affect American burying beetle habitat through the action of surface water.

Keystone's CMRP provides further details with regard to erosion control following construction.

- Immediately following construction, disturbed areas will be temporarily stabilized by broadcasting cool season species such as annual rye grass or wheat seed. Where necessary, clean, weed-free wheat straw will be used as mulch to protect seed and increase soil moisture. These grasses are annual species that senesce when temperatures warm during summer; they will not become permanently established. During the spring, a mixture of native warm season grasses will be planted within the ROW. This will include species such as little bluestem, big bluestem, Indiangrass, and switchgrass. Natural recruitment of other native grasses and forbs will also occur. It should be noted that some portions of the ROW, in response to landowner requirements, will be revegetated using non-native species such as smooth brome. This type of re-vegetation will likely be restricted to areas that are currently dominated by improved grass pastures and will therefore not lead to a reduction of habitat dominated by native species. In the limited circumstance where landowners request re-vegetation of previously native vegetation to non-native vegetation, Keystone will consider this as a permanent effect on habitat and will provide appropriate mitigation for those areas. Keystone's CMRP provides further details with regard to restoration of ROWs following construction.
- Keystone is committed to habitat restoration following construction. The American burying beetle monitoring program will provide assurances that the acres disturbed would be restored appropriately. Failure is unlikely due to Keystone's commitment to re-seed in subsequent years if unsuccessful after the first growing season. Criteria for successful reclamation are: 1) reclamation will be measured 4 years after the commencement of construction; 2) for reclamation to be deemed successful, native grasslands restored on the ROW must be comparable to those on adjacent undisturbed lands; 3) 70 percent of the dominant species on the ROW must be the same as those that occur on adjacent off-ROW lands.
- The NPPD and Rosebud Electric Cooperative will schedule power line and switching station construction activities during the American burying beetle dormant or inactive time (October 31 to March 31). The power providers will coordinate with USFWS and NGPC to determine appropriate measures to minimize potential effects if such scheduling cannot be accomplished due to unexpected circumstances, including weather delays.
- WAPA will schedule substation site grading activities during the American burying beetle dormant or inactive time (September 15 to April 1) for the substation that would serve PS-21 in South Dakota.

3.2.6.4. Effects of the Action

Pipeline Construction

Effects on individual American burying beetles could occur during construction of various elements of the pipeline system, including permanent access roads, on-ROW facilities, off-ROW auxiliary sites, and the pipeline itself. Effects could occur as a result of vegetation clearing, grading, and trench excavation. This could include temporary disturbance, potential injury, and/or

potential mortality to eggs, larvae, pupae, and adults through construction vehicle traffic and exposure during excavation. Adults that are not reproducing and are sheltering in soils or leaf litter during the day may be killed or injured by crushing, although data by Hoback (2016) suggest the risk to burying beetles buried typical depths is around 1 percent even when a vehicle passes directly over them. Excavation and other ground-disturbing activities would be more likely to affect American burying beetles that may be present. Construction activities could also lead to effects on the species through effects on its habitat, namely temporary habitat loss, potential permanent alteration of suitable habitat to unsuitable habitat, and habitat fragmentation where the pipeline is not already co-located with other utilities. The use of temporary access roads would not affect this species because all of the proposed temporary access roads within the range of this species are existing access roads and would not require grading or other maintenance to accommodate Keystone's proposed use.

Artificial lighting has the potential to temporarily disrupt foraging and increase predation on the American burying beetle. Most construction would take place during daylight hours and construction areas would not generally use artificial lighting. Activities that could potentially require lighting could include critical pipeline tie-ins, HDD crossings, and certain work required after sunset due to weather, safety, or other proposed-Project requirements. HDD crossings would require 24-hour operation until the crossing is completed. Localized fuel spills may occur during construction. However, Keystone would develop and implement a Spill Prevention Control and Countermeasures Plan (Appendix D, Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan) to avoid or minimize any short-term effects.

The American burying beetle is sensitive to soil moisture and dies when desiccated (Bedick et al. 2006). Under laboratory conditions, American burying beetles seek soils containing high moisture levels during periods when they are inactive. During construction, soil moisture may be reduced across the ROW as the site is prepared by removing vegetation and topsoil and grading. Equipment operations within the ROW would compact the substrate; however, as described above under conservation measures, sub-soil and soil would be de-compacted and vegetation cover would be re-established within both the temporary and permanent ROW. Native vegetation seed would generally be used, unless otherwise directed by the landowner. As stated in the proposed-Project CMRP (Appendix B), the objectives of restoration and revegetation are to return the disturbed areas to approximate pre-construction vegetation, use, and capability. This involves treatment of soil as necessary to preserve approximate pre-construction capability and stability in a manner consistent with the original vegetation cover and land use. Keystone is required to monitor the pipeline no less frequently than every 3 weeks once operations begin. This would mostly be done from aerial reconnaissance, but also ground inspections. In addition, landowners are asked to report on areas where seeds have not germinated or where erosion has occurred. Keystone will then dispatch crews to repair and address the issues that are found (see also Section 4.16 in Appendix B, Construction, Mitigation, and Reclamation Plan). In wetlands, the contractor would replace topsoil and restore original contours with no crown over the trench, as much as practicable. Any excess soil would be removed from the wetland. The contractor would stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and revegetation, as applicable, during final cleanup. It is anticipated that the construction methods of replacing topsoil and re-establishing appropriate, non-sod-forming vegetation would result in re-establishing natural soil hydrology within the construction ROW and would result in no long-term effects on American burying beetle habitat outside of the permanent ROW and areas occupied by facilities.

As shown in Table 3.2-13, approximately 197 acres of American burying beetle habitat in South Dakota would be permanently affected from various proposed Keystone facilities (approximately 34 acres prime, 73 acres good, 61 acres fair, and 30 acres marginal). Areas rated poor are not counted as potentially suitable habitat. Temporary effects would occur on approximately 314 acres of potential American burying beetle habitat from proposed pipeline system construction activities in South Dakota. None of these effects in South Dakota would occur on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the decisions of WAPA or RUS. Some of these effects could occur on parcels subject to USACE decisions related to PCNs under Section 404; because these PCNs have not yet been received by the USACE, the quantity of effects at such locations cannot be estimated at this time.

Permanent Effects	Marginal	Fair	Good	Prime	Total
Permanent Easement (CL ROW)	30.30	60.60	72.55	24.18	187.64
Pump Station	0.00	0.00	0.00	8.42	8.42
Permanent Access Road Easement	0.00	0.00	0.00	1.27	1.27
Total Acres Permanently Affected	30.30	60.60	72.55	33.87	197.33
Temporary Effects					
Temporary Easement (CL ROW)	35.96	71.77	84.97	28.77	221.47
Additional Temporary Workspace (CL ROW)	5.98	14.40	15.94	10.86	47.18
Auxiliary Sites	0.00	0.00	45.57	0.00	45.57
Total Acres Temporarily Affected	41.94	86.17	146.48	39.64	314.22

 Table 3.2-13
 Estimated American Burying Beetle Habitat Area in South Dakota Affected by the Proposed Pipeline System

CL ROW = centerline of the right-of-way

As shown in Table 3.2-14, approximately 288 acres of American burying beetle habitat would be permanently affected in Nebraska from the proposed pipeline system. Of the approximately 288 acres that would be permanently affected in Nebraska, about 160 acres are considered prime habitat, 86 acres good, 10 acres fair, and 32 acres marginal. Areas rated poor are not counted as potentially suitable habitat. Temporary effects to habitat in Nebraska would affect approximately 445 acres, of which about 245 acres are considered prime habitat, 152 acres good, 8 acres fair, and 40 acres marginal (Table 3.1-15). None of these effects in Nebraska would occur on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the decisions of WAPA or RUS. Some of these effects in Nebraska could occur on parcels subject to USACE decisions related to PCNs under Section 404; because these PCNs have not yet been received by the USACE, the quantity of effects at such locations cannot be estimated at this time.

Permanent Effects	Marginal	Fair	Good	Prime	Total
Permanent Easement (CL ROW)	31.91	6.20	80.59	159.29	277.99
Permanent Access Road Easement	0.00	3.76	5.73	0.99	10.48
Total Acres Permanently Affected	31.91	9.96	86.32	160.28	288.47
Temporary Effects					
Temporary Easement (CL ROW)	37.77	7.53	96.43	185.64	327.38
Additional Temporary Workspace (CL ROW)	2.55	0.00	12.63	29.52	44.71
Auxiliary Site ^a	0.00	0.00	43.00	30.01	73.01
Total Acres Temporarily Affected	40.32	7.53	152.06	245.17	445.09

Table 3.2-14 Estimated American Burying Beetle Habitat Area in Nebraska Affected by the Proposed Pipeline System

CL ROW = centerline of the right-of-way ^a Includes potential alternate site locations

Effects on individual American burying beetles through disturbance, injury, or mortality during construction can be estimated using an occurrence rate and the acres of suitable habitat affected (Table 3.2-15). The occurrence rate was estimated using the results of 2018 and 2019 surveys by Dr. Wyatt Hoback submitted to the USFWS in combination with a dataset from the USFWS showing all other American burying beetle survey data within 1 mile of the proposed pipeline ROW. The estimate of individuals per acre is intended to be conservative, as it is based mostly on trapping results in high-quality habitats (prime and good). The estimate also factors in potential reproductive output, typically around 15 offspring per two adults (USFWS 2019f). This approach is consistent with other abundance estimated occurrence rates are 0.0899 American burying beetle per acre in South Dakota, 0.0046 American burying beetle per acre in Nebraska in Holt County.

Based on the occurrence rates and the acres of suitable habitat that would be affected (Tables 3.2-14 and 3.2-15), approximately 46 adult American burying beetles would be affected during construction in South Dakota and approximately 19 American burying beetles would be affected during construction in Nebraska (Table 3.2-15).

Table 3.2-15Estimated Number of Individual American Burying Beetles Affected During
Pipeline System Construction

State	Affected Acres	American Burying Beetles per Acre	Estimated Number Affected
South Dakota	511.56	0.0899	45.99
Nebraska (Boyd Co. and Keya Paha Co.)	383.02	0.0046	1.76
Nebraska (Holt Co.)	350.54	0.0495	17.35
		Total	65.10

Operation

American burying beetles could be affected by the operating pipeline while they hibernate. The active period for the American burying beetle across its range is usually late April through September (USFWS 1991). Active periods are related to night air temperatures, with peak activity occurring when night temperatures are 60 degrees Fahrenheit (°F) or greater at midnight. Upon emergence from overwintering, American burying beetles seek a suitable carcass upon which to reproduce. They spend approximately 6 weeks underground attending the carcass followed by emergence of the new brood in early August.

Emerging individuals seek a carrion resource upon which they feed and then they find an area in which to overwinter, presumably digging beneath the ground in an area that cools to low temperature (to depress metabolic rate) but does not freeze solid (Hoback and Conley 2014).

Oil transport through the pipeline releases heat that is dissipated through the soil to the ground surface. TQUEST geothermal models of pipeline effects to surrounding soils, calculated at ultimate capacity operating flow rates for the proposed Project (830,000 barrels per day), indicate the potential for the pipeline to warm surface areas by as much as 10 °F in northern regions (South Dakota and Nebraska) (See Appendix E, Pipeline Temperature Effects Study). Combined with the occurrence rates detailed above, it is possible to estimate whether effects to the American burying beetle would likely result from the rise in soil temperatures caused by pipeline operation. It is currently not known whether the American burying beetle would be attracted to soil that is artificially warmed, repelled by it, or neither.

In northern portions of the American burying beetle range, in Nebraska and South Dakota, soil temperatures drop to below freezing during the winter when the beetles are underground. According to Dr. Wyatt Hoback, the beetles in northern parts of their range likely have adapted a survival strategy that requires cooling to or very near freezing to slow metabolism such that fat reserves are sufficient to last until emergence in late May or early June. Whether American burying beetles would suffer mortality from starvation if they were kept from freezing is not known, but substantial decreases in length of time soil temperatures are below freezing would likely cause the beetles to use too much fat energy during the winter months when they are underground. While they are underground, warming of the soil from the pipeline may also cue the American burying beetles to emerge prematurely (i.e., prior to late May or early June) when midnight air temperatures have not yet reached 60 °F. This may result in American burying beetles above ground without the ability to feed appropriately, or it may cause them to use more energy resources to rebury themselves in the soil, assuming temperatures permit such an activity.

A complicating factor in evaluating thermal effects to overwintering American burying beetles is that the effects vary with depth in the soil, and there are disparities in available information regarding the depth at which American burying beetles overwinter in the soil. Although Schnell et al. (2008) noted in field experiments in Arkansas that American burying beetles overwintered at an average depth of 2.4 inches with some as deep as 8 inches, most information refers to depth of carcass burial associated with reproduction. These reproductive chamber depths are described as "several inches" by Ratcliffe (1996, p. 46), or up to 24 inches underground (Wilson and Fudge 1984; Pukowski 1933; and Hinton 1981; as cited in Scott 1998). Hoback (2016) states that the

most likely depth for an American burying beetle not involved in burying a carcass for reproduction is 7 inches.

For the Pipeline Temperature Effects Study (Appendix E), potential temperature changes (compared to background) were analyzed at depths of 6 inches, 12 inches, and 24 inches. Additionally, potential temperature changes were analyzed at various distances from the pipeline centerline and within two soil types at different moisture levels. The temperature model (Appendix E, Pipeline Temperature Effects Study) predicted a reduction in the incidence of frozen soils at a depth of 12 inches and a distance of 11 feet from the pipeline centerline. The estimated total duration of unfrozen soils would likely be sufficient to affect American burying beetles overwintering within 11 feet from the pipeline centerline. Uncertainties and assumptions are associated with both the heat dissipation model and the biological requirements of the American burying beetle. However, temperature shifts above background levels substantial enough to influence habitat out to 11 feet from the pipeline (i.e., a 22-foot sub-corridor) were determined to make habitat unsuitable for American burying beetle overwintering. Some level of thermal effects may extend beyond the 22-foot sub-corridor. However, distinct and measurable differences that are likely biologically significant for American burying beetles can be identified only out to 11 feet from the pipeline centerline based on the available model (Appendix E, Pipeline Temperature Effects Study).

Proposed-Project effects that modify soil temperature could increase overwintering mortality by (1) triggering early emergence when prey is not available and when cold temperatures could result in adult mortality; (2) causing higher metabolism for these insects resulting in starvation prior to emergence; or (3) causing mortality from the beetles losing too much water because warmer temperatures result in greater desiccation risk to burying beetles (Bedick et al. 1999). Therefore, routine operation of the proposed Project may affect American burying beetles and their habitat. Modeled heat dissipation from the pipeline indicates potential seasonal thermal effects on soil freezing to an area within about 11 feet around the pipe compared to background temperatures (see Appendix E, Pipeline Temperature Effects Study). These effects would occur in approximately 83 acres of potentially suitable habitat in South Dakota, 65 acres of potentially suitable habitat in Nebraska in Boyd County and Keya Paha County, and 57 acres of potentially suitable habitat in Nebraska in Holt County. It is not known whether these thermal effects would permanently prevent use of the affected area, or if American burying beetles could recolonize the affected area annually; however, this analysis assumes that American burying beetles could be affected each winter that the pipeline is in operation in potentially suitable habitat. Considering that pipeline construction activities are expected to render these areas unsuitable habitat for approximately the first 4 years of the life of the proposed Project, heat effects from the operating pipeline in suitable habitat may occur approximately 46 times.

It is not known whether the American burying beetle considers surface soil temperature when selecting an overwintering site, although it is known that burying beetles typically remain just below the frost line (Hoback and Conley 2014). However, assuming the American burying beetle chooses an overwintering site in any potentially suitable habitat and without regard to soil temperature or other effects of the pipeline, any individuals that attempt to overwinter in the heat-affected area in any year that the pipeline is in operation could be affected. Using the estimates of

0.0899 American burying beetle per acre in South Dakota, 0.0046 American burying beetle per acre in Nebraska in Boyd County and Keya Paha County, and 0.0495 American burying beetle per acre in Nebraska in Holt County, and assuming that heat from the pipeline would affect any American burying beetle that overwintered within 11 feet of the pipeline, the estimated number of American burying beetles affected by heat from pipeline operations is shown in Table 3.2-16.

Table 3.2-16	Estimated Number of Individual American Burying Beetles Affected by Heat
	from Pipeline Operations

State	Miles of Potentially Suitable Habitat	Affected Acres	American Burying Beetles per Acre	American Burying Beetles Exposed to Heat Effects per Year	Estimated Number Affected over Life of Project
South Dakota	31.0	82.5	0.0899	7.42	341.25
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	65.1	0.0046	0.30	13.78
Nebraska (Holt Co.)	21.5	57.2	0.0495	2.83	130.27
				Total	485.30

Another aspect of the proposed Project operations other than heat that may affect the American burying beetle is artificial lighting. Lights associated with aboveground facilities, particularly if the lights emit wavelengths in the ultraviolet spectrum, may attract American burying beetles, as they are known to be attracted to light. However, only one light with down-shield attached above each pump station door would be used.

None of these effects of normal operations would occur on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions.

Emergency repairs and other maintenance activities could also affect the American burying beetle, particularly when such activities involve excavation. Routine maintenance would be scheduled outside of the active season for this species. However, emergency repairs may be completed at any location along the pipeline system at any time of year, including during the active season for this species, and using any equipment necessary to complete the repairs. This could lead to effects on individuals as described above for pipeline construction. Keystone estimates that less than 10 acres of suitable habitat would be affected by such activities. This is based on the following assumptions: (1) there will be 10 surveys over the 50 years as required by PHMSA to look for any locations needing maintenance, (2) history tells Keystone that there will be 0.05 location per mile per survey that would require some kind of maintenance, (3) each maintenance location will involve an area measuring approximately 110 feet wide by 50 feet long, totaling approximately 0.13 acre per location, and (4) all locations would occur in suitable habitat. Factoring these assumptions with the length of the proposed pipeline system within the range of the American burying beetle leads to an estimate of somewhat less than 10 acres affected. Rounding up to 10 acres and apportioning these 10 acres across the counties according to the length of pipeline system within each county and factoring the affected area with the estimated number of individuals per acre, Table 3.2-17 shows the estimated number of individuals expected to be affected by repairs to the pipeline.

State	Estimated Affected Acres	American Burying Beetles per Acre	American Burying Beetles Affected
South Dakota	3.00	0.0899	0.27
Nebraska (Boyd Co. and Keya Paha Co.)	3.00	0.0046	0.01
Nebraska (Holt Co.)	4.00	0.0495	0.20
		Total	0.48

Potential Spills

Potential spills could occur anywhere along the pipeline system. Direct contact with a crude oil spill could result in effects to the American burying beetle due to oiling of buried beetles and crude oil ingestion from contaminated carrion. The American burying beetle is the only species in this BA for which an estimated occurrence rate per acre is available. This species is more or less a resident, whereas the other species in this BA are either migratory or were never observed during targeted surveys. Based upon an estimated occurrence rate of 0.0899 American burying beetle per acre in South Dakota, 0.0046 American burying beetle per acre in Nebraska in Boyd County and Keya Paha County, and 0.0495 American burying beetle per acre in Nebraska in Holt County; the spill incident rates described in Appendix C; and the length of pipeline segment that would pass through potentially suitable habitat; the estimated number of American burying beetles potentially affected by spills is shown in Table 3.2-18. Spills resulting from the proposed pipeline would be likely to result in effects on approximately four American burying beetles over the life of the proposed Project.

State	Miles of Pipeline	Expected Small Spills per Year	Expected Medium Spills per Year	Expected Large Spills per Year	Expected Area Affected per Year (acres)	American Burying Beetles per Acre	American Burying Beetles Affected per Year	Estimated Number Affected over Life of Project
South Dakota	31.0	0.0787	0.0158	0.0022	0.64	0.0899	0.0585	2.64
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	0.0620	0.0124	0.0017	0.50	0.0046	0.0024	0.11
Nebraska (Holt Co.)	21.5	0.0546	0.0110	0.0015	0.44	0.0495	0.0223	1.01
	<u>.</u>						Total	3.76

 Table 3.2-18 Estimated Number of American Burying Beetles Affected by Spills

Power Infrastructure

Three power lines, a substation rebuild, and a switching station coincide with areas of potentially suitable habitat for the American burying beetle. This power infrastructure would serve PS-20 and

PS-21 in Tripp and Gregory counties, South Dakota, and PS-22 in Holt County, Nebraska. No other power infrastructure required for the proposed Project would overlap the current range of this species. The power infrastructure to PS-20 would involve RUS's decision to help finance the construction of the power infrastructure. The power infrastructure for PS-21 would involve WAPA's rebuild of its Gregory substation, RUS's decision to help finance the construction of the power line, and WAPA's decision regarding interconnection; BLM and the USACE would not be involved. The power infrastructure for PS-22 would not involve any federal agency.

Construction of power infrastructure to these pump stations could affect the American burying beetle. Power lines would not negatively affect the American burying beetle except where pole structures would be installed. For substations or switching stations, this analysis assumes that all area within a proposed development site would no longer provide habitat for the American burying beetle after construction begins. For pole structures, the level of permanent effect from poles occupying habitat area would be very small, as each pole would affect only 3 square feet, resulting in a total area of 0.038 acres across all three power lines. Pole installation activities would involve pedestrian and vehicular traffic; however, data by Hoback (2016) suggest the risk to burying beetles buried typical depths is very low even when a 33-ton NPPD truck vehicle passes directly over them. Therefore, the risk of disturbance, injury, or mortality of American burying beetles caused by pole structure installation is very low outside of the immediate area of ground disturbance where poles would be embedded. Trees would be eliminated from the power line ROW, in an area totaling approximately 2 acres for the line to PS-21 and approximately 3 acres for the line to PS-22. Although this might influence the quality of habitat for the American burying beetle, it would not remove any suitable habitat and would be unlikely to change current habitat ratings. Continued operations of the proposed power infrastructure would be highly unlikely to affect the American burying beetle, although the potential exists for disturbance of individuals during maintenance, mowing, pole replacement, and other activities involving vehicular traffic.

Construction of the power line to PS-20 could result in the temporary disturbance, injury, or mortality of individual American burying beetles where the power line overlaps potentially suitable habitat within the range of this species. Considering that the American burying beetle in Tripp County, South Dakota, only occurs south of U.S. Route 18, only a small portion of this 20.5-mile power line, approximately 2.7 miles, would lie within the range of this species. Assuming 58 pole structures would be required along this portion of the line, an area of permanent disturbance covering 3 square feet per pole (total 0.030 acres), and an occurrence rate of 0.0899 American burying beetle per acre, installation of power pole structures is expected to affect 0.0004 American burying beetles.

Construction of the 20.5-mile long power line to PS-21 could result in the temporary disturbance, injury, or mortality of individual American burying beetles. Assuming 434 pole structures would be required, an area of permanent disturbance covering 3 square feet per pole (total 0.030 acres), and an occurrence rate of 0.0899 American burying beetle per acre, installation of power pole

structures could affect approximately 0.003 American burying beetles.⁸ Additionally, rebuilding of WAPA's substation at the north end of this power line could affect individuals. Given the occurrence rate of 0.0899 individuals per acre and the maximum disturbance of 6 acres, up to approximately 0.54 American burying beetles could be affected.⁸ However, WAPA's conservation measure of conducting site grading during the American burying beetle's inactive period would reduce the likelihood of effects on individuals from this substation rebuild.

WAPA's proposed substation rebuild would eliminate less than approximately 6 acres of marginal habitat, although this is likely outside the occupied range of the species. The removal of this habitat is not likely to have any additional effect on the American burying beetle, as there is other suitable habitat within the typical nightly movement range of this species (0.31 to 0.76 miles per night) (USFWS 2014a). The American burying beetle population in this region is likely not limited by habitat. The amount of habitat for this population is considered "good" and is estimated at 2,961,469 suitable acres (USFWS 2019f).

Construction of the 2.5-mile long power line to PS-22 and the 3.5-acre switching station could affect individual American burying beetles, although the conservation measure of constructing this power infrastructure during the American burying beetle's inactive period would reduce the likelihood of effects. Regardless of this conservation measure, assuming 54 pole structures would be required, an area of permanent disturbance covering 3 square feet per pole (total 0.004 acres) plus a 3.5-acre switching station, and an occurrence rate of 0.0495 American burying beetle per acre, construction of this power infrastructure could affect up to 0.174 American burying beetles. The elimination of 3.5 acres of marginal habitat at the proposed switching station is not likely to have any additional effect on the American burying beetle, as there is other suitable habitat within the typical nightly movement range of this species (0.31 to 0.76 miles per night) (USFWS 2014a). The American burying beetle population in this region is likely not limited by habitat. The amount of habitat for this population is considered "good" and is estimated at 8,633,685 suitable acres (USFWS 2019f).

The total area affected and the estimated number of individuals affected by the proposed power infrastructure is shown in Table 3.2-19.

State	Affected Acres	American Burying Beetles per Acre	Estimated Number Affected
South Dakota	6.04 ^a	0.0899	0.54 ^a
Nebraska (Boyd Co. and Keya Paha Co.)	0.00	0.0046	0.00
Nebraska (Holt Co.)	3.50	0.0495	0.17

Table 3.2-19Estimated Number of Individual American Burying Beetles Affected During
Power Infrastructure Construction

⁸ The northern portion of this proposed power line ROW (approximately 9 out of 20.5 miles) would lie outside of the likely occupied range of the species (see Figures 3.2-7 and 3.2-8). Considering that the American burying beetle is not likely to be affected outside of its likely occupied range, the total number of individuals that could be affected from installation of this power line would likely be less than the number shown. Considering that WAPA's proposed substation rebuild would also lie outside of the likely occupied range of this species, none of these effects would occur on federal lands.

State	Affected Acres	American Burying Beetles per Acre	Estimated Number Affected
		Total	0.72 ^a

^a A portion of the proposed power infrastructure in Gregory County, South Dakota, would lie outside of the likely occupied range of the species; thus, the number of individuals that could be affected from installation of this power infrastructure would likely be less than the number shown.

Considering the habitat quality around the proposed power infrastructure, the likely occupied range of the American burying beetle, the amount of suitable habitat surrounding the action area (USFWS 2019f), the Hoback (2016) report of the very limited effect of vehicular traffic on burying beetles, and the conservation measures described above, it is unlikely that the proposed power infrastructure would affect more than one American burying beetle.

Cumulative Effects

The Proposed Federal Decisions could potentially affect the American burying beetle through disturbance of individuals during construction, as well as by permanently eliminating potentially suitable habitat. The conservation measures described above would minimize effects on the American burying beetle.

Other future non-federal activities reasonably certain to occur within the action area that also may affect individuals and/or potentially suitable habitat include non-federal pipelines, power infrastructure, residential and commercial development, state and county road projects creating new disturbed land or additional lighting, conversion of forested habitat to agricultural land, and the conversion of range lands or undeveloped lands to row crop agriculture. Of these, the conversion of lands to row crop agriculture is likely to have the largest effect.

When large areas of native woodland and native grasslands are affected, loss and fragmentation of these habitats incrementally reduce the recovery potential of the American burying beetle by damaging the functionality of these supporting ecosystems. Philpott (2013) reported 1.3 million acres of grassland was converted from grassland to cropland in Nebraska, South Dakota, Iowa, Minnesota, and North Dakota from 2006 to 2011, due to high grain prices and federally subsidized crop insurance. In South Dakota, over 650,000 acres of grassland was converted to corn and soybeans. In Nebraska, over 300,000 acres was converted from grass to corn and soybeans and a considerable amount of this conversion has been with the American burying beetle range in Nebraska (Philpott 2013).

Commercial development is expanding to undeveloped lands on the periphery or in suburbs of cities. Residential developments are being constructed outside city limits or in previously undeveloped or rural areas. The specific numbers of new or anticipated projects and associated acres of disturbance are difficult if not impossible to quantify. However, it is clear that there are numerous, continuing, and expanding effects on the American burying beetle and its habitat from projects without a federal nexus. All of the above activities can cause loss and further fragmentation of habitat in Nebraska and South Dakota. Construction activities that disturb soils within the current range of this species can cause mortality of American burying beetle adults, and (potentially) larvae and eggs. Although direct mortality from individual construction activities is local and constitutes a short-term effect, the cumulative loss of individuals from multiple

development projects in a larger area may eventually reduce the ability of a given population to survive in a fragmented landscape.

Lighting associated with construction of new roads (i.e., not associated with the proposed Project) and new residential developments can result in harassment and disruption of normal feeding behavior when American burying beetles are attracted to lights. Future construction and developments of this type by state or private entities may harass this species and interfere with feeding or breeding by distracting the species from finding carcasses.

Climate change has been identified as a potentially serious threat to the American burying beetle (USFWS 2019f). Potential future non-federal GHG emissions within the action area would likely add only a minor contribution to the global GHG emissions inventory. However, global climate change overall would likely have an effect to the American burying beetle within the action area (USFWS 2019f). A warmer, drier climate would be less conducive to American burying beetle survival. This may lead to the reduced likelihood of the species persisting in the Great Plains outside of the Sand Hills population.

Considering the likely effects due to climate change, expanding agriculture, habitat alterations, and possible disturbance of individuals, cumulative effects on the American burying beetle would likely be greater than the effects of the proposed Project alone.

3.2.6.5. Determination

Effect on the Species

The proposed Project "<u>may affect, and is likely to adversely affect</u>" the American burying beetle. This determination is based on the location of the proposed Project within the known range and occupied habitat of the American burying beetle and the likely effects of construction and operation. This determination considers Keystone's, WAPA's, and NPPD's commitments to the various conservation measures described above. The estimated number of individuals that may be affected by each aspect of the proposed Project, as well as the overall total, are shown in Table 3.2-20.

State (County)	Miles of ROW	Expected Area Affected (acres)	American Burying Beetles per Acre	American Burying Beetles Affected		
Effects of Construction						
		Pipeline Construc	tion			
South Dakota	31.0	511.56	0.0899	45.99		
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	383.02	0.0046	1.76		
Nebraska (Holt Co.)	21.5	350.54	0.0495	17.35		
	65.10					
Power Infrastructure Construction						
South Dakota	23.2	6.04	0.0899	0.54		
Nebraska (Boyd Co. and Keya Paha Co.)	0	0.00	0.0046	0.00		
Nebraska (Holt Co.)	2.5	3.50	0.0495	0.17		
			Subtotal	0.71		

Tuble 5/2 20 Estimated Total Multiper of Milerican Datying Decites Milected

State (County)	Miles of ROW	Expected Area	American Burying Beetles per Acre	American Burying Beetles Affected
	Rom	Effects of	65.81	
Effects of Operation				
^		Heat Effects		
South Dakota	31.0	3795.92 ^a	0.0899	341.25
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	2994.60 ^a	0.0046	13.78
Nebraska (Holt Co.)	21.5	2631.66 ^a	0.0495	130.27
	485.30			
		Pipeline Repair	S	
South Dakota	31.0	3.00 b	0.0899	0.27
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	3.00 ^b	0.0046	0.01
Nebraska (Holt Co.)	21.5	4.00 ^b	0.0495	0.20
	0.48			
South Dakota	31.0	29.36 ^b	0.0899	2.64
Nebraska (Boyd Co. and Keya Paha Co.)	24.4	23.11 ^b	0.0046	0.11
Nebraska (Holt Co.)	21.5	20.36 ^b 0.0495		1.01
	3.76			
Effects of Operation Subtotal				489.53
Overall total	555.35			

^a Given that heat effects could recur in the same places every winter for the 46 years in the life of the proposed Project that the pipeline is expected to operate in potentially suitable, recovered habitat, the number shown represents 46 times the area affected at any one time.

^b This area is the total expected to be affected during the life of the proposed Project.

3.3. EFFECTS ON FEDERALLY THREATENED SPECIES

3.3.1. Northern Long-Eared Bat—Threatened

The northern long-eared bat was listed as a federally threatened species on April 2, 2015. The primary threat to the northern long-eared bat is white-nose syndrome (WNS), an infectious disease responsible for substantial mortality in some hibernating insectivorous bats of the northeastern United States. This disease has now spread throughout most of the range of the northern long-eared bat within the United States (USFWS 2019e). No critical habitat has been designated for this species. USFWS published an ESA Section 4(d) rule on January 14, 2016, that specifically defines take prohibitions in order to protect maternity colonies and hibernacula (Endangered and Threatened Wildlife and Plants; 4(d) Rule for the Northern Long-Eared Bat, 81 Fed. Reg. 1900 [January 14, 2016], 50 CFR 17). According to the 4(d) rule, human disturbances of northern long-eared bat habitat are not likely to threaten this species unless the activities disturb hibernacula or maternity roosts. Although construction and operation of the proposed Project could affect the northern long-eared bat by disturbing individuals or by modifying/cutting forested habitat, the proposed Project does not propose any prohibited take.

3.3.1.1. Natural History and Habitat Association

Numerous scientific articles on the northern long-eared bat indicate that the species prefers intact, closed-canopy forests for foraging, although individuals will forage along the forest edge

(Patriquin and Barclay 2003; Jung et al. 1999; Barbour and Davis 1969). The northern long-eared bat rarely flies through non-forested areas, particularly large non-forested areas such as large agricultural fields (Henderson and Broders 2008; Hogberg et al. 2002). Foraging area typically varies between 114 and 160 acres within intact forests (Broders et al. 2006; Owen et al. 2003), but may be as small as 14 acres in fragmented forest and agricultural landscapes (Henderson and Broders 2008).

Roosting occurs primarily within intact, closed-canopy forests (Menzel et al. 2002; Owen et al. 2002; Foster and Kurta 1999). Roost tree species and diameter are highly variable (Lacki and Schwierjohann 2001; Foster and Kurta 1999) although snag density, tree density, and presence of cavities or loose bark appear to be important roosting features (Menzel et al. 2002; Owen et al. 2002, 2003; Foster and Kurta 1999). Proximity to water has also been identified as an important feature for roosting and foraging (Henderson and Broders 2008; Carter and Feldhamer 2005; Sasse and Perkins 1996).

3.3.1.2. Potential Presence in Action Area

Keystone commissioned surveys for bat species of concern in 2013, before this species was listed under the ESA (Appendix N, 2013 Bat Survey Report). Based on descriptions of northern longeared bat habitat as well as conferencing with the USFWS in Grand Island on May 20, 2014, Keystone has identified northern long-eared bat habitat on the proposed-Project pipeline and facility sites that are within the probable range of the northern long-eared bat. At that time, Keystone determined the range of the northern long-eared bat based on the USFWS's Interim Guidance (USFWS 2014c), which was expanded by the Montana USFWS office in an email to the Nebraska USFWS office (Berglund 2014). Based on the Interim Guidance and the Montana USFWS office's email, the range of the northern long-eared bat relative to the proposed Project includes all of South Dakota and Nebraska as well as all of Dawson, Prairie, and Fallon counties, Montana. Since the Interim Guidance was issued, the USFWS has further refined the range map for the species; however, the definition used in the 2015 assessment is still relevant to the proposed Project in 2018 (USFWS 2018b).

Further, as a result of the May 20, 2014, meeting, Keystone created a key (WESTECH 2015) to conservatively identify northern long-eared bat habitat relative to the proposed Project. A description of that key is summarized below.

Forested area that meets one or more of the following characteristics:

a. The area contains a relatively closed canopy (e.g., greater than 50 percent canopy closure (Sasse and Pekins 1996). Note that this is a minimum; the average forested canopy cover in this study was 78 percent. Given that the proposed Project occurs in a more fragmented agricultural landscape than where these surveys were conducted, and that the proposed Project is in the Great Plains where tree density is typically lower, an approximate value of 50 percent canopy closure was used as an indication of closed canopy.

b. Snags and trees with exfoliating bark, deeply furrowed bark, cavities, and crevices are present (Lacki and Schwierjohann 2001; Carter and Feldhamer 2005; Lacki et al. 2009; Park 2010). In some cases data on these features have been collected in the field. If data have not been collected

but it was known that a forested area was comprised of relatively large trees that frequently have deeply furrowed bark (e.g., plains cottonwood stands in Tripp County, South Dakota), it was assumed that exfoliating or deeply furrowed bark or cavity features were present.

c. The area crossed by the proposed Project appears to be part of a stand that is at least 14 acres in size (Henderson and Broders 2008). Note that this is the smaller stand size found to support the northern long-eared bat based on a study of fragmented forested and agricultural landscapes.

d. The area is proximal to a waterbody, stream, river, pond, or reservoir (Sasse and Perkins 1996; Carter and Feldhamer 2005; Henderson and Broders 2008). A specific distance was not identified for this characteristic. One study found that during the driest months water was within 2,460.6 feet of a roost (Carter and Feldhamer 2005). Since water may or may not be present in a drainage or pond depending on precipitation, it was assumed that if a forested area occurred along a drainage, stream, or river, or if a pond was visible on aerial imagery in the vicinity, then the site was proximal to water.

Yes—wooded area is northern long-eared bat habitat.

No—wooded area is not northern long-eared bat habitat.

Using pedestrian survey field data, Keystone applied this definition of habitat to any forested area crossed by the proposed pipeline or within proposed-Project auxiliary sites where access was allowed. Although it is highly unlikely that the northern long-eared bat would cross large non-forested areas such as cultivated fields (Henderson and Broders 2008; Hogberg et al. 2002), Keystone included isolated forest patches as habitat per the USFWS's direction and the key above, as well as many scattered stands of relatively small trees per the USFWS's statement in 2014 that the northern long-eared bat could use trees with only a 3-inch diameter at breast height. Consequently, this method resulted in a conservative estimate of potentially suitable northern long-eared bat habitat that may be overlapped by the proposed Project (see Appendix O, 2014 Northern Long-Eared Bat and Red Knot Habitat Assessment, and Appendix P, Northern Long-Eared Bat Habitat Survey Nebraska Mainline Alternative Route).

Because a pedestrian survey of northern long-eared bat habitat has not been completed on the proposed power line routes, Keystone simply mapped forested habitat crossed by, or within 300 feet of, each proposed power line route. Keystone has updated the 2015 assessment with more recent aerial imagery and the currently proposed power line routes. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, where available, was also used to determine the extent of potential habitat near the proposed Project.

Montana

Northern long-eared bat presence has historically been considered highly limited in Montana, with a total of 25 confirmed records of the species in the state (MNHP 2019, Maxell 2018). Recent surveys in 2019 have expanded the known range of this species in Valley and McCone counties and have documented northern long-eared bat presence within the action area near the Fort Peck

spillway (MNHP 2019). The south side of the Missouri River crossing near the Fort Peck spillway was surveyed with acoustic detectors and mist nets from June 17 to 22, 2019. While northern longeared bats were not detected acoustically, a total of four individuals were captured in mist nets. Of these, three were lactating females, indicating the presence of a maternity colony in the vicinity of the action area. However, no maternity roosts associated with these captures were identified.

Although the proposed Project is located mostly in generally unsuitable habitat for the species in Montana, Keystone did map and quantify potentially suitable forested habitat within the survey corridor for the northern long-eared bat according to the habitat key developed with input from the USFWS in 2014. Given the recent range expansion in Montana as described above, the proposed pipeline infrastructure in Valley and McCone counties was not evaluated by Keystone; rather, this assessment conservatively includes any forested area, as interpreted from aerial imagery, that could potentially serve as northern long-eared bat roosting and/or foraging habitat. Based upon Keystone's habitat key and the subsequent review of aerial imagery within the action area in Valley and McCone counties, the proposed pipeline system work areas would overlap 6.7 acres of forested habitat potentially suitable for use by roosting and/or foraging northern long-eared bats in Montana. None of this area is on WAPA-owned lands or lands owned or managed by the USACE. A total of 0.3 acres of potentially suitable forested habitat within the action area overlaps land managed by BLM.

Keystone also reviewed and revised forested habitat mapping along the proposed power lines to PS-13 and PS-14 in Montana (the proposed power lines to PS-09, PS-10, PS-11, and PS-12 were located in counties outside the northern long-eared bat range at the time [USFWS 2018b; MNHP 2019]). According to current records, the proposed power line to PS-09 is still outside of the range of the northern long-eared bat (MNHP 2019). Based on the analysis conducted by Keystone, and subsequent aerial imagery review of power lines to PS-10, PS-11, and PS 12 as a result of the species range expansion in Montana, there are approximately 2.86 acres of potentially suitable forested habitat that overlap the proposed power lines that would serve PS-10, PS-12, and PS-13, which are subject to WAPA interconnection decisions. Additionally, the power line serving PS-10 crosses lands managed by BLM, including approximately 0.03 acres of habitat potentially suitable for use by roosting and/or foraging northern long-eared bats.

South Dakota

No known occupied northern long-eared bat maternity roosts or hibernacula have been identified within the action area. There are no records of northern long-eared bats within 1 mile of the proposed pipeline in South Dakota (SDNHP 2018). Keystone mapped and quantified forested habitat within the survey corridor for northern long-eared bat according to the habitat key developed with input from the USFWS in 2014. Based upon that key, the proposed pipeline work would overlap approximately 11.2 acres of wooded habitat potentially suitable for use by roosting and/or foraging northern long-eared bats in South Dakota, none of which is located on BLM-managed lands, WAPA-owned lands, or lands owned or managed by the USACE. Keystone also reviewed and revised forested habitat mapping along the proposed power lines to all pump stations in South Dakota (PS-15 through PS-21), as the entire state is within the species' range (USFWS 2018b). Based on that analysis, there are approximately 7.7 acres of potentially suitable forested

habitat that would overlap the proposed power line work in South Dakota, all of which are lands involved in the WAPA and/or RUS decisions.

At a county level, the northern long-eared bat has been documented in Harding County and has the potential to occur in the other counties crossed by the proposed Project (Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Northern Long-Eared Bat With 4(d) Rule; Final Rule and Interim Rule, 80 Fed. Reg. 63 [April 2, 2015]). However, the Harding County observations are from 2005 and those records are considered provisional. More recent 2016 mist net surveys, acoustic sampling, and genetic sampling of guano have not produced any verified detections of northern long-eared bat in that general vicinity (U.S. Forest Service 2017).

Given the very small amount of potentially suitable habitat that could conservatively support northern long-eared bat proximal to the proposed Project, the lack of occurrence within 1 mile of the proposed-Project route, and the general lack of documented northern long-eared bat occurrence in the action area, the potential for northern long-eared bat occurrence near the action area in South Dakota is extremely low.

Nebraska

There are no records of northern long-eared bat within 1 mile of the proposed pipeline in Nebraska, including BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions including (NNHP 2018).

Keystone mapped and quantified potentially suitable forested habitat for northern long-eared bat within the pipeline survey corridor in Nebraska according to the habitat key developed with input from the USFWS in 2014. Based upon that key, the proposed pipeline work would overlap approximately 52.1 acres of forested habitat potentially suitable for use by roosting and/or foraging northern long-eared bats in Nebraska, none of which is located on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the decisions of WAPA or RUS. Power infrastructure that would serve pump stations in Nebraska were not evaluated by Keystone; rather, the assessment conservatively judged that any forested area, as interpreted from aerial imagery, could potentially serve as northern long-eared bat habitat. Accordingly, the proposed power line work in Nebraska would overlap approximately 7.42 acres of potentially suitable forested habitat, none of which are located on BLM-managed lands, WAPA-owned lands, or lands owned or managed by the USACE, or other lands involved in the decisions of WAPA or RUS. Some of the potentially suitable habitat near the proposed pipeline or power line routes could be subject to the decision of the USACE if PCNs are necessary for wetland or stream crossings.

Given the small amount of habitat that could conservatively support northern long-eared bat within the action area and the lack of occurrence within 1 mile, the potential for northern long-eared bat occurrence near the action area in Nebraska is very low.

3.3.1.3. Conservation Measures

Keystone will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the northern long-eared bat and potentially suitable habitat for the species, as well as to comply with requirements of the Final northern long-eared bat 4(d) rule. Crossings of major rivers and riverine habitat will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season.

- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Should HDD activities occur at night, lights will be down-shielded.
- Where practicable, vegetative screening at HDD sites will be maintained to prevent disturbance of northern long-eared bats.
- No tree removal will occur within 0.25 miles of a known occupied hibernaculum.
- No tree removal will occur within 150 feet of a known occupied maternity roost tree during the pup season (June 1 to July 31).
- Pre-construction presence/absence surveys will be completed if there is a need to remove potentially suitable habitat within the proposed action area during the pup season (June 1 to July 31). If required, surveys will be conducted pursuant to local USFWS field office and state resource agency requirements and the need for additional seasonal tree clearing restrictions, if any, will be determined in coordination with applicable state and federal resource agencies pending survey results.
- During aerial surveillance, aircraft will maintain at least 1,000 feet of elevation.
- Keystone will prepare and implement a project-specific SPCC Plan.

3.3.1.4. Effects of the Action

Pipeline Construction

Potential temporary effects on the northern long-eared bat were evaluated in terms of effects on individuals and effects on potentially suitable habitat. Considering that the northern long-eared bat is highly unlikely to occur within the action area, including BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions (MNHP 2018; 2019; NNHP 2018; SDNHP 2018), effects on individuals are highly unlikely. Further, tree removal activities will be conducted in accordance with the final northern long-eared bat 4(d) rule, and incidental take, if any, would not be prohibited.

In terms of potentially suitable habitat, the proposed pipeline would affect approximately 70 acres of forested habitat potentially suitable for use by roosting and/or foraging northern long-eared bats (Keystone 2018b). Of these, a total of 0.3 acres occur within the action area on BLM-managed lands. None of the identified forested habitat occurs on WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the decisions of WAPA or RUS. Some of these areas could be subject to the decision of the USACE if PCNs are necessary for wetland or stream crossings. The construction of the pipeline would involve the conversion of these forested areas to non-forested areas. Of the total affected acreage, approximately half would be permanently

converted to herbaceous vegetation atop the permanent pipeline ROW, while approximately half could regrow over a period of several years in areas used for temporary ROW. These areas would thus no longer provide potentially suitable roosting or foraging habitat for the northern long-eared bat. However, according to the 4(d) rule, these types of habitat conversion "have not been shown to have significant negative impacts on northern long-eared bat populations." (81 Fed. Reg. 1900).

Operations

Given that the northern long-eared bat is highly unlikely to occur within the action area, and that no disturbance to habitat is proposed during normal operations, effects on this species from normal operations of the proposed Project are highly unlikely.

Emergency repairs and other maintenance activities have some potential to result in additional temporary effects to the northern long-eared bat. Generally routine maintenance activities would be conducted within the permanent pipeline ROW, and as such, no additional impacts on potentially suitable northern long-eared bat habitat or individuals would occur. However, emergency repairs may require the removal of potentially suitable forested habitat, and may occur at any time of year, including during the active season for this species. Although the frequency, location, and extent of such activities cannot be predicted with certainty, it is possible that some activities could occur within potentially suitable habitat for the northern long-eared bat. This could lead to effects on individuals and potentially suitable habitat, as described above for pipeline construction if occupied trees are removed. However, given the species distribution relative to the action area, temporary effects to northern long-eared bats are unlikely.

Potential Spills

An updated spill analysis can be found in Appendix C. The likelihood of a spill occurring within the known range of the northern long-eared bat is shown in Table 3.3-1. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Habitat surveys have been completed along the entire pipeline ROW, and in some cases extended beyond the ROW to a total width of 300 feet; these found that suitable habitat for listed species was absent from the survey corridor within much of the species' known ranges. Therefore, the likelihood of spills occurring within potentially suitable habitat for this species would be lower than that listed in Table 3.3-1.

Table 3.3-1Likelihood of Spills Occurring within the Range of the Northern Long-eared
Bat

Resource (Species Range)	Small Spills per Year	Medium Spills per Year	Large Spills per Year	Estimated Years Between Spills within Species Range
Northern long- eared bat	1.3	0.2	0.04	0.8

Direct contact with a crude oil spill could result in effects on northern long-eared bats due to external oiling and crude oil ingestion from contaminated prey or water. Habitat near wetlands and streams could also be affected by the spill and response activities. While these exposure risks have

the potential to cause effects on individuals, including potential injury or mortality, effects on the northern long-eared bat are unlikely, due to the low probability of a spill occurring in potentially suitable habitat and the low probability of a northern long-eared bat contacting the spilled crude oil.

Power Infrastructure

The construction, operation, and maintenance of associated power infrastructure would not require the removal of trees other than as allowed under the northern long-eared bat final 4(d) rule, as no known occupied hibernacula occur within 0.25 mile of proposed power line routes and no known occupied maternity roosts occur within 150 feet of proposed power lines routes. Reviews of aerial imagery and field surveys indicate that approximately 18.0 acres of potentially suitable forested habitat would be affected by the proposed power infrastructure, including approximately 2.9 acres in Montana (including 0.03 acres on BLM-managed lands), approximately 7.7 acres in South Dakota, and approximately 7.4 acres in Nebraska (Keystone 2018d). Some of these areas could be subject to the decision of the USACE if PCNs are necessary for wetland or stream crossings. The construction of the power lines would involve the conversion of forested areas to non-forested areas. Of the total affected acreage, approximately half would be permanently converted to herbaceous vegetation along the permanent power line ROW, while approximately half could regrow over a period of several years in areas used for temporary ROW. These areas would thus no longer provide potentially suitable roosting or foraging habitat for the northern long-eared bat. According to the 4(d) rule, these types of habitat conversion "have not been shown to have significant negative impacts on northern long-eared bat populations." (81 Fed. Reg. 1900).

Therefore, this component of the proposed Project would not likely affect the northern long-eared bat on federal or non-federal lands. Further, tree removal activities will be conducted in accordance with the final northern long-eared bat 4(d) rule, and incidental take, if any, would not be prohibited.

3.3.1.5. Cumulative Effects

The Proposed Federal Decisions could lead to the alteration of approximately 88 acres of potentially suitable habitat. Other, non-federal projects reasonably certain to occur within the action area that also may disturb individuals and/or convert potentially suitable forested habitat include power infrastructure, residential and commercial development in urbanizing areas, oil and gas exploration and development, and conversion of forested habitat to agricultural land or rangeland. Some of these projects may affect individual bats or bat habitat. However, given the lack of recorded observations of occupied roost trees, the limited extent of suitable habitat, and the absence of known hibernacula in the action area, these effects are expected to be minor.

Considering that the USFWS "recognized that all other (non-WNS) threats cumulatively were not impacting the species at the population level" (81 Fed. Reg. 1900), cumulative effects on the northern long-eared bat are expected to be minor.

3.3.1.6. Determination

Effect on the Species

While there are currently records of four individuals within the action area near the Fort Peck spillway in Montana, there are no known occupied maternity roost trees within 150 feet or known occupied hibernacula within 0.25 mile of the action area. The Proposed Federal Decisions and the proposed Project "<u>may affect</u>" the northern long-eared bat due to the alteration of approximately 88.0 acres of potentially suitable roosting and/or foraging habitat. However, tree clearing activities will be completed in accordance with the final northern long-eared bat 4(d) rule. As such, the proposed Project relies on the USFWS January 5, 2016, Programmatic Biological Opinion on the Final 4(d) Rule for the Northern Long-Eared Bat and Activities Excepted from Take Prohibitions to fulfill its Section 7(a)(2) consultation obligation.

3.3.2. Piping Plover—Threatened

3.3.2.1. Natural History and Habitat Association

The piping plover was listed as endangered and threatened December 11, 1985 (Endangered and Threatened Wildlife and Plants; Determination of Endangered and Threatened Status for Piping Plover, 50 Fed. Reg. 50720 [December 11, 1985]). Piping plover on the Great Lakes were listed as endangered, while the remaining Atlantic and Northern Great Plains populations were listed as threatened. Migrating and wintering populations of piping plover also were classified as threatened. Populations of piping plover potentially present within the action area are considered to belong to the threatened Northern Great Plains population. The USFWS designated critical habitat for the Northern Great Plains breeding population of the piping plover in Montana, Nebraska, North Dakota, and South Dakota in 2002 (Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover, 67 Fed. Reg. 176 [September 11, 2002]), but the Nebraska critical habitat was later vacated (USFWS 2016a).

Historically, piping plover bred across three geographic regions: U.S. and Canadian Northern Great Plains from Alberta to Manitoba south to Nebraska, Great Lakes beaches, and Atlantic coastal beaches from Newfoundland to North Carolina. Wintering areas are not well known, although wintering birds have been most often seen along the Gulf of Mexico, southern U.S. Atlantic coastal beaches from North Carolina to Florida, eastern Mexico, and scattered Caribbean islands (Haig 1986; USFWS 1988b). The piping plover's current breeding range is similar except that breeding populations in the Great Lakes have almost disappeared (Haig and Plissner 1993).

Piping plover begin arriving on breeding grounds in mid-April and most birds have arrived in the Northern Great Plains and initiate breeding behavior by mid-May (USFWS 1994). Populations that nest on the Missouri, Platte, Niobrara, and other rivers use beaches and dry barren sandbars in wide, open channel beds (USFWS 2012). Nesting season for the piping plover is from April 15 through August 15. Nesting habitat of inland populations consists of sparsely vegetated shorelines around small alkali lakes, large reservoir beaches, river islands and adjacent sandpits, and shorelines associated with industrial ponds (Haig and Plissner 1993). Vegetation cover is usually

25 percent or less (USFWS 1994). Piping plovers feed by probing the sand and mud for insects, small crustaceans, and other invertebrates in or near shallow water. When feeding, this species alternates between running and pausing to search for prey (Bent 1929).

Nests consist of shallow scrapes in the sand with the nest cup often lined with small pebbles or shell fragments. The nest is typically far from cover. Nesting piping plover have been found in least tern nesting colonies at a number of sites on Great Plains river sandbars and sand pits (USFWS 1994). Egg laying commences by the second or third week in May. The female generally chooses from several nest sites the male has constructed. Complete clutches contain three to four cryptically colored eggs (USFWS 1994). Incubation is shared by the male and female and averages 26 days. Incubation begins only after the last egg is laid and eggs typically hatch on the same day. Brooding duties also are shared by the male and female. Broods remain in nesting territories until they mature unless they are disturbed. Fledging takes approximately 21 to 35 days (USFWS 1994). If a nest fails or is destroyed, adults may re-nest up to four times (USFWS 1987). Breeding adults begin leaving nesting grounds as early as mid-July with the majority gone by the end of August (Wiens 1986, as cited in USFWS 1994).

Threats to piping plover nesting habitat include reservoirs, channelization of rivers, and modifications of river flows that have eliminated hundreds of miles of nesting habitat along northern Great Plains rivers (USFWS 1994). Eggs and young are vulnerable to predation and human disturbance, including recreational activities and off-road vehicle use. Human-caused disturbance to wintering habitats is also a threat to the continued existence of this species. Motorized and pedestrian recreational activities, shoreline stabilization projects, navigation projects, and development can degrade and eliminate suitable wintering habitat for this species.

3.3.2.2. Potential Presence in Action Area

The proposed Project does not cross designated critical habitat. The proposed Project would cross six rivers that could contain potentially suitable nesting habitat for the piping plover: the Missouri and Yellowstone rivers in Montana; the Cheyenne River in South Dakota; and the Niobrara, Elkhorn, and Platte in Nebraska. None of these pipeline crossings at these rivers occur on BLM-managed lands, WAPA-owned lands, lands owned or managed by the USACE, or other lands involved in the Proposed Federal Decisions. The proposed power lines to PS-9 and PS-10 overlap BLM-managed lands, WAPA-owned lands, lands owned and managed by USACE, as well as lands subject to a WAPA interconnection decision. The remaining power lines subject to WAPA and/or RUS decisions in Montana and South Dakota do not cross these rivers. An assessment of the potential occurrence of piping plover at these identified river crossings is provided below. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, where available, was also used to determine the extent of potential habitat near the proposed Project.

Potential presence of breeding piping plovers within the action area is restricted to Montana and Nebraska. During a meeting with Keystone representatives on June 10, 2008, SDGFP stated that breeding piping plovers are not located within the action area in South Dakota. Potential nesting

habitat within the action area for the piping plover is restricted to sandy beaches and sandbars along the Platte and Niobrara rivers in Nebraska and alkali wetlands and the Fort Peck Reservoir in Montana (Atkinson and Dood 2006; Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover, 67 Fed. Reg. 57637 [September 11, 2002]). According to the USFWS Billings Ecological Services Field Office in Montana, individual transient piping plovers may be observed along the Yellowstone River but there are no nesting records within the action area (AECOM 2009a).

Table 3.3-2 summarizes the piping plover survey results from 2008 to 2013. For a full report, see Appendix G, Interior Least Tern and Piping Plover 2013 Survey. Surveys would be repeated at these locations prior to construction to ensure that no nests have been built within 0.25 mile of the ROW or any areas affected by construction activities. In addition to the surveys described above, the USFWS Nebraska Field Office conducted surveys for piping plovers within suitable habitat in the Middle Loup, Loup, Elkhorn and Lower Platte rivers in Nebraska. The surveys of the Elkhorn and Lower Platte rivers included the crossings of the proposed Project.

State	County	Survey Location	Survey Date	Survey Results	Comments
Montana	Valley/ McCone	Missouri River	June 3 and July 11, 2011; June 11, 2013; July 3, 2019	No piping plovers observed at river crossing	Unlikely nesting habitat, possible foraging habitat
Montana	Dawson	Yellowstone River	June 3 and July 11, 2011; June 13, 2013; July 2, 2019	No piping plovers observed at river crossing	Suitable nesting habitat was not observed but could be present in other years depending on river flows. Suitable foraging habitat was noted
South Dakota	Meade / Pennington / Haakon	Cheyenne River	July 23, 2008; June 6, 2011; June 18 and 19, 2013; July 1, 2019	No piping plovers observed at river crossing	Good bank and potential island nesting habitat depending on river flows, suitable foraging habitat at crossing location
Nebraska	Keya Paha/ Rock	Niobrara River	July 22, 2008; July 7, 2011; June 22 - 26, 2012 ^a	One piping plover observed in 2008 ^a	Good bank and island nesting habitat, suitable foraging habitat at crossing location ^a
Nebraska	Merrick / Hamilton	Platte River ^b	July 22, 2008; July 6-7, 2011; July 15-20, 2012; June 25, 2013	No piping plover observed at river crossing	Suitable nesting habitat was not observed but could be present in other years depending on river flows
Nebraska	Butler /Colfax	Platte River ^c	June 15, 2011; August 8, 2011; June 25, 2019	No piping plovers observed at river crossing	Crossing has been extensively altered by large- scale flooding (2019 survey)

Table 3.3-2Occurrence Surveys for the Piping Plover along the Proposed Project Right-
of-Way in 2008, 2011, 2012, 2013, and 2019

State	County	Survey Location	Survey Date	Survey Results	Comments
Nebraska	Antelope / Pierce	Elkhorn River	June 14, 2011 July 27, 2011	No piping plover observed at river crossing	Large expanses of high, dry point bars, measuring between 10 acres to 21 acres, were observed. On average, point bars rose 6 feet above the water

^a Surveys of the Niobrara River were conducted approximately 10 miles west (10.4 river miles upstream) of the currently proposed site before the route was changed. It is likely that similar conditions occur at the current crossing.

^b Surveys of the Platte River were conducted before the route was changed, at approximately 41 miles west of the currently proposed site. See document text for details.

^c The current Platte River crossing as presented in this document was surveyed by the USFWS in 2011 and by Keystone in 2019.

While the following assessment of potential piping plover presence within the action area focuses on potentially suitable nesting habitat, some potential exists for migrating individuals to encounter proposed-Project activities during the fall and spring migration. Generally, inland breeding piping plovers appear to migrate directly to the Gulf of Mexico or the Atlantic Coast in the fall, based on the fact that northern plains breeders are rarely documented at seemingly appropriate stopover locations (Elliot-Smith and Haig 2004). A similar pattern is observed in the spring, with few inland breeders stopping. As such, very few, if any, individuals would be expected to encounter construction-related activities during seasonal migrations.

Montana

Missouri River

The proposed pipeline would cross the Missouri River via HDD approximately 1.1 river miles below the point where the Fort Peck spillway enters the Missouri River, and approximately 9.2 river miles below Fort Peck dam proper. Surveys were completed at the proposed crossing on June 3 and July 11, 2011, and again on June 11, 2013. Both survey efforts determined that suitable nesting habitat at the crossing was unlikely due to regulated flows from Fort Peck dam and the lack of sparsely vegetated sand and gravel bars that are preferred nesting substrate for piping plover (Elliott-Smith and Haig 2004). In particular, the 2013 survey noted that, "suitable habitat is unlikely at the Missouri River crossing based on the densely vegetated emergent mud bars present at the crossing. This consistent flow levels due to dam-controlled water releases immediately upstream of the crossing. No…piping plovers, or other shorebirds or wading birds, other than 1 killdeer, were observed…over several hours of survey" (see Appendix G, Interior Least Tern and Piping Plover 2013 Survey). Land cover at the proposed power line to PS-10 consists of the Fort Peck dam face and a small residential area.

Consistent with the survey observations, a review of aerial imagery between 2006 and 2018 at the river crossing site indicates a general lack of vegetation-free sand bars within 0.25 mile of the river crossing. Mud flats are inconsistently exposed at the crossing from year to year and appear to be quickly vegetated with emergent vegetation similar to what was observed in 2011 and 2013. Photos of the crossing site from 2013 and 2017 showed small, vegetated mud flats at the crossing.

Similar to least tern, piping plover prefer nest sites with open sand, gravel, or in some cases, shellcovered substrate with sparse vegetation (Elliott-Smith and Haig 2004). That type of habitat is either very limited or lacking at the proposed pipeline crossing site, and lacking along the proposed power line to PS-10.

Breeding piping plovers have be documented at the Fort Peck Reservoir. Wetland and waterbody surveys conducted between May and November 2008 to 2011 did not identify any suitable wetlands for nesting piping plovers along the entire route in Valley County.

An MNHP query identified a total of 44 piping plover occurrences within 5 miles of the proposed pipeline crossing and PS-10 in McCone County (MNHP 2019). Occurrences were for both single and multiple birds, including chicks. A number of the occurrences had evidence of nesting. The sightings were documented from 1194 through 2011. Of these occurrences, there a nine documented along the Missouri River between the proposed pipeline crossing and Fort Peck Dam. Most records are in May or June and could represent nesting birds; some records indicate that nesting was documented along the shore of Fort Peck Reservoir between 1 and 2 miles west of Fort Peck dam (McEneaney 1974; Prellwitz 1986). Overall, these various observations are approximately 2 to 9 miles west of the proposed pipeline crossing site, and approximately 0.5 to 3 miles north or west of the power line to PS-10 (eBird 2018). Although there are several records of piping plover near Fort Peck dam, only the records from near the Roundhouse Point Recreation area appear to clearly support observations of nesting birds (McEneaney 1974; Prellwitz 1986; Sheridan 2009). That site is approximately 2 miles west of the proposed power line and 9 miles west of the proposed pipeline crossing. Otherwise, the observations indicate piping plover foraging but not nesting (e.g., Auer 2018). In summary, at the Missouri River, nesting piping plover are known to occur within 2 to 9 miles of the proposed pipeline crossing, and within 2 miles of the proposed power line to PS-10.

Suitable nesting habitat within 0.25 mile of the proposed power line to PS-10 is entirely lacking. The only water and shoreline habitat within 0.25 mile of the proposed power line is that immediately below Fort Peck dam which consists of a steep, riprap shoreline or small farm ponds further north along the route. It is unlikely that nesting piping plover would be present within 0.25 mile of the proposed power line at Fort Peck dam due to lack of suitable nesting habitat.

Potentially suitable nesting habitat within 0.25 mile of the proposed pipeline crossing is poor and frequently lacking due to consistent water levels and limited nesting substrate that is quickly vegetated by dense, emergent vegetation. It is unlikely that nesting piping plover would be present within 0.25 mile of the proposed pipeline crossing at the Missouri River due to lack of potentially suitable nesting habitat.

Yellowstone River

The proposed pipeline would cross the Yellowstone River via HDD approximately 7.9 river miles below the I-94 bridge crossing near Fallon, Montana. Surveys were completed at the proposed crossing on June 3 and July 11, 2011, and again on June 13, 2013. Although suitable nesting habitat was not present at the time in 2011 or 2013, both survey efforts determined that suitable nesting habitat at the crossing was possible if water levels were lower. In particular, the 2013 survey noted

that, "no suitable nesting habitat for...piping plover was present. The south bank is a steep cut bank with no gravel or sand bars present. The north bank was comprised of a series of low, wellvegetated terraces and a wide mud flat at water's edge. The mud flat was moderately vegetated, with a mix of herbaceous and woody species (cottonwood and tamarisk seedlings and saplings), but it appears too densely vegetated to be suitable...piping plover habitat. No individuals...were observed, nor were other wading birds or shorebirds. Suitable habitat may be present during the breeding season in years when water levels are lower or later in the summer" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

A review of aerial imagery between 2006 and 2018 at the river crossing site indicates that bare sand or gravel bars are often present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These bars are between 0.22 and 0.35 mile from the HDD entry and exit point, respectively, depending on the time of year and water levels. Much more extensive bare sand or gravel bars exist downstream of the proposed crossing between 1.5 and 13 river miles. A photo of the crossing site from 2013 showed vegetated sand bars on the north side of the river (primarily the noxious weed leafy spurge), and steep cut banks on the south side of the river.

Similar to least tern, piping plover prefer nest sites with open sand, gravel, or in some cases, shellcovered substrate with sparse vegetation (Elliott-Smith and Haig 2004). Open sand and gravel bars may be present within 0.25 mile of the proposed crossing site depending on water elevation and time of year as described above.

An MNHP query identified two nesting piping plover observations within 12 miles of the proposed crossing site (MNHP 2018). The closest consistent MNHP records of nesting piping plover occur in the Big Arm portion of Fort Peck Lake approximately 75 miles northwest of the Yellowstone River proposed crossing. The closest eBird piping plover record is approximately 60 miles north at Fox Lake Wildlife Management Area; that record is of a migrant piping plover (Williamson 2018).

Presence of potentially suitable nesting habitat for piping plover within 0.25 mile of the proposed pipeline crossing is possible, depending on water levels. It is possible that nesting piping plover could be present within 0.25 mile of the proposed pipeline crossing at the Yellowstone River, although the likelihood of piping plover within 0.25 mile is low due to the paucity of observations within 75 miles of the proposed crossing. It is more likely that nesting piping plover would be present between 1.5 and 13 miles downstream of the proposed Yellowstone River crossing where suitable habitat is more common.

Milk River

The Milk River would be crossed by the proposed pipeline and by two proposed electrical power lines serving pump stations. However, these areas are unlikely to harbor piping plover because the river and sandbars are comparatively small; Great Plains piping plover typically nest on sandbars greater than 15 acres in extent (Catlin 2009). In addition, there are no known occurrences of the piping plover using this river.

The proposed electrical power line to PS-09 would cross the Milk River at a point at which the river is only approximately 90 feet wide. Additionally, a review of aerial imagery from 1996, 2004,

2005, 2006, 2009, 2011, and 2014 did not reveal the presence of any sparsely vegetated sand bars within 0.5 mile. Piping plover are known to nest on the shores of Nelson Reservoir, which lies approximately 3 miles from this crossing, and to visit small wetlands in northern Phillips County; however, the proposed power line has been routed to avoid these features and there are no known occurrences of piping plover within 1 mile of the proposed power line.

The proposed electrical power line to PS-10 would cross the Milk River three times within a 0.8-river-mile stretch of river. The river width along this stretch is approximately 115 feet. Additionally, a review of aerial imagery from 1996, 2004, 2005, 2006, 2009, 2011, and 2012 did not reveal the presence of any sparsely vegetated sand bars within 0.5 mile.

The proposed pipeline would also cross the Milk River at a point at which the river is approximately 115 to 200 feet wide. Although a review of aerial imagery revealed the occasional presence of sparsely vegetated sand bars nearby, the largest of the bars is less than 2 acres.

Although there are no documented occurrences of piping plover on the Milk River, there have been 19 occurrence of piping plover on Nelson Reservoir, just south of the Milk River and within 5 miles of the proposed pipeline alignment. Birds have been documented in certain years from 1986 through 2004 (MNHP 2019). All but 2 of the occurrences provided evidence of nesting.

In addition to occurrences associated with river crossings, one other occurrence of piping plover was documented in 2011 at Lake Baker located in Fallon County, Montana. This occurrence was within 5 miles of the proposed pipeline to the east. However, there was no evidence of breeding (MNHP 2019).

South Dakota

Although SDGFP stated that piping plovers do not breed within the action area in South Dakota, the potential for their occurrence was evaluated nonetheless.

Cheyenne River

The proposed pipeline would cross the Cheyenne River via HDD approximately 5.6 river miles upstream of the SR-34 bridge crossing south of Howes, South Dakota. Surveys were completed at the proposed crossing on July 23, 2008; June 6, 2011; and June 18 and 19, 2013. All surveys noted that suitable nesting habitat was present, although no piping plover were observed. The 2013 survey stated, "suitable...piping plover habitat was present on sand/gravels bars within the braided stream channel, primarily on the large sand/gravel bar closest to the north bank. The sand/gravel bars in the middle and south portion of the main channel provided less suitable nesting habitat due to denser vegetation. No individual [piping plovers] were observed, although other shorebirds (spotted sandpiper and killdeer) were observed on the northernmost sand/gravel bar" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

Open sand and gravel bars are typically present within 0.25 mile of the proposed crossing site depending on water elevation and time of year. Aerial imagery between 2006 and 2018 at the proposed Cheyenne River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded.
These sand bars are approximately 0.25 mile from the HDD entry point and approximately 0.17 mile from the HDD exit point, depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles. A photo of the crossing site from 2013 showed sparsely vegetated sand and gravel bars.

There are no SDNHP records of piping plover within 1 mile of the proposed pipeline crossing (SDNHP 2018). The closest eBird piping plover record is approximately 47 miles southeast near Midland, South Dakota (Stolz and Parkin 2016), but the most common records occur on Lake Oahe between 43 and 75 miles to the east of the proposed crossing (Miller 2018).

Suitable nesting habitat for piping plover is typically present at the proposed Cheyenne River HDD crossing. Depending on the time of year and water levels, suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting piping plover could be present within 0.25 mile of the proposed pipeline crossing at the Cheyenne River as suitable nesting habitat is typically present; however, the likelihood of nesting piping plover within 0.25 mile of the HDD entry and exit points is low as there are no records of nesting piping plover proximal to the proposed crossing.

Little Missouri River

The proposed power line to PS-15 would cross the Little Missouri River at a point at which the river is approximately 170 feet wide. A review of aerial imagery from 2003, 2004, 2005, 2006, 2010, and 2014 revealed the frequent occurrence of sparsely vegetated sand bars and islands nearby. However, the largest of the bars is less than 2.5 acres, considerably smaller than the preferred size of 15 acres or more (Catlin 2009). There are no known occurrences of piping plover at this crossing.

White River

The proposed pipeline would cross the White River at a point at which the river is approximately 320 feet wide. A review of aerial imagery from 1991, 2004, 2005, 2006, 2010, 2011, 2014, and 2017 revealed the frequent occurrence of sparsely vegetated sand bars and islands within 0.25 mile of the proposed crossing. However, the largest of the bars was less than 9 acres. Potentially suitable nesting habitat for piping plover may be present at the proposed White River crossing. Depending on the time of year and water levels, potentially suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that piping plover could be present within 0.25 mile of the proposed pipeline crossing at the White River as suitable nesting habitat is often present, although there are no records of piping plover in the immediate area.

Nebraska

Piping plovers breeding in Nebraska are found nesting on sandbars and at commercial sand pits and forage in wet sand on sandbars and mud flats in rivers and associated wetlands along the Niobrara and Platte rivers crossed by the proposed Project. Piping plovers migrate through Nebraska during both the spring and fall. These crossings were historically identified as critical habitat for the piping plover. Personal communications with the USFWS Grand Island, Nebraska, Field Office in 2008 and 2009 indicated that designated critical habitat has been vacated in Nebraska and is no longer legally recognized as such (USFWS 2008d).

The MAR would cross the Platte and Niobrara rivers within the piping plover's estimated current breeding range. The MAR's crossing of the Elkhorn River is west of the estimated current breeding range. Piping plovers would only potentially occur in the area of the MAR during the breeding and nesting season.

Crossings of the Platte and Niobrara rivers were surveyed by Keystone in 2008, 2011, and 2012 to confirm presence or absence of suitable breeding habitat and breeding piping plovers. However, since the route was changed to the MAR, the new crossings of these two rivers have not been surveyed for piping plover.

The USACE may issue verifications in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. PCNs are anticipated for other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

Niobrara River

The proposed pipeline would cross the Niobrara River via HDD approximately 1.6 river miles upstream of the 469th Avenue bridge crossing south of Naper, Nebraska. Surveys have not been completed at this site due to lack of access. Surveys were completed at the previous Niobrara River crossing approximately 10 miles west of the currently proposed site. Those previous surveys were completed July 22, 2008; July 7, 2011; and June 22 to 26, 2012. The 2013 survey report stated, "NOT SURVEYED IN 2013—NO ACCESS. The 2012 survey noted excellent potentially suitable ...piping plover habitat on numerous sand bars...Although the 2012 survey was at a proposed river crossing that is upstream of the current crossing, it is likely that similar conditions occur at the current crossing" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey).

Aerial imagery between 2006 and 2018 at the proposed Niobrara River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.10 mile from the HDD entry point and approximately 0.23 mile from the HDD exit point depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

Open sand and gravel bars are typically present within 0.25 mile of the proposed crossing site depending on water elevation and time of year. One piping plover was observed at the previous crossing in 2008.

The NNHP lists 12 piping plover observations within 5 miles of the proposed Niobrara River crossing (NNHP 2019). The closest eBird record of probable piping plover occurs approximately

13 miles west of the proposed crossing site. Other, more common records of piping plover occur at Spencer Dam Wildlife Management Area and the Missouri River.

Suitable nesting habitat for piping plover is often present at the proposed Niobrara River HDD crossing, depending on water levels and the arrangement of bare sand bars, both of which fluctuate annually.

Elkhorn River

The proposed pipeline would cross the Elkhorn River via HDD approximately 0.2 river miles upstream of the 534th Avenue bridge crossing north of Tildon, Nebraska. Surveys for piping plovers were conducted in June and July 2011. A total of seven adult piping plovers were observed. No nests were active during the survey.

Aerial imagery between 2006 and 2018 at the proposed Niobrara River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.10 mile from the HDD entry point and approximately 0.23 mile from the HDD exit point depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

NNHP lists two piping plover observations within 5 miles of the proposed Elkhorn River crossing (NNHP 2019). Surveys along the Elkhorn River, including the HDD crossing site, were conducted in 2011. No piping plovers were observed (USFWS 2011a).

Potentially suitable nesting habitat for piping plover is often present in the vicinity of the proposed Elkhorn River HDD crossing depending on water levels and the arrangement of bare sand bars, both of which fluctuate annually. Depending on the time of year and water levels, potentially suitable nesting habitat may also be present within 0.25 mile of the HDD entry and exit points. It is possible that nesting piping plover could be present within 0.25 mile of the proposed pipeline crossing at the Elkhorn River as suitable nesting habitat is typically present and piping plover were observed during the nesting season in the vicinity of the proposed crossing as well as further east in similar habitat.

Platte River

The proposed pipeline would cross the Platte River via HDD approximately 9.4 river miles downstream of the Highway 81 bridge crossing south of Columbus, Nebraska. Surveys have not been completed at this site. Surveys were completed at the previous Platte River crossing approximately 41 miles west of the currently proposed site. Those previous surveys were completed July 22, 2008; July 6 and 7, 2011; July 15 to July 20, 2012; and June 25, 2013. Habitat at the previous crossing was variable; the 2013 survey states, "Sand bars and banks along the middle channel (MP 775.2) and the south (main) channel (MP 775.4) were not suitable...piping plover habitat because they were recently exposed and saturated to the surface; however, these areas, particularly the south channel, would likely have suitable habitat during breeding season in years when water levels are lower. No individual [piping plovers] were observed, nor were other wading birds or shorebirds. No suitable habitat is present on the northernmost channel (MP

775.05), which is a heavily vegetated, inactive channel" (Appendix G, Interior Least Tern and Piping Plover 2013 Survey). Habitat at the current crossing has been observed in May 2018 during wetland surveys, but water levels were high and all potential nesting sites were inundated.

Aerial imagery between 2006 and 2018 at the proposed Platte River crossing site indicates that bare sand or gravel bars are consistently present within 0.25 mile of the HDD crossing after spring runoff when high water has receded. These sand bars are approximately 0.26 mile from the HDD entry point and approximately 0.40 mile from the HDD exit point, depending on the time of year and water levels. Extensive bare sand or gravel bars exist upstream and downstream of the proposed crossing for several miles.

Open sand and gravel bars are often present within 0.25 mile of the proposed crossing site depending on water elevation and sand bar arrangement. Surveys for piping plover were completed in 2008, 2011, 2012, and 2013 as described above at the previous Platte River crossing. No piping plover were observed during any of these surveys at the previous Platte River crossing.

The NNHP lists 18 piping plover observations within 5 miles of the current proposed Platte River crossing; it is unclear if this observation represents nesting birds or a transient sighting (NNHP 2019). A survey of the Platte River in 2011 did not identify any piping plovers (USFWS 2011a).

3.3.2.3. Conservation Measures

Keystone, and electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the piping plover and potentially suitable habitat for the species.

- Crossings of major rivers and riverine habitat will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season.
- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Where practicable, vegetative screening at HDD sites will be maintained to prevent disturbance of piping plovers.
- Should HDD activities occur at night, lights will be down-shielded when the site is within 0.25 miles of potentially suitable habitat and vegetative screening is lacking.
- Pre-construction presence/probable absence surveys of pipeline crossings will occur within 0.25 mile of potentially suitable breeding habitat at the Platte, Elkhorn, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone River in Montana during the piping plover nesting season (April 15 to September 1) to ensure that there are no nesting pairs within 0.25 mile of the construction area. If piping plover nests are found at the crossings, Keystone will: (1) adhere to a 0.25-mile buffer of no pipeline construction activity and (2) continue to monitor nests if any are within 0.25 mile of the construction footprint until young have fledged.

- Daily surveys for nesting piping plovers will be conducted during the nesting season when construction activities occur within 0.25 mile of potential nesting habitat.
- If nesting piping plovers are present, Keystone will make minor adjustments to the pipeline corridor, if practicable, to avoid nesting plovers, in coordination with USFWS. This may involve shifting the pipeline corridor away from nests to avoid disturbances to piping plover nests or other modifications depending on the circumstances.
- To the extent practicable, construction within 0.25 mile of a piping plover nest will occur mostly during daytime hours and will comply with any local noise regulations.
- Construction equipment will be properly equipped with mufflers to lessen noise impacts.
- Keystone will prepare and implement a project-specific SPCC Plan.
- Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite.
- Refueling and lubrication of construction equipment will occur in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.
- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible.
- Equipment will not be washed in streams or wetlands.
- Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials.
- Water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow.
- Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30-day period except where the hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.
- During aerial surveillance, aircraft will maintain at least 1,000 feet of elevation.
- If construction of power lines occurs during the piping plover nesting season, surveys of potentially suitable riverine and/or sand pit plover nesting habitat within 0.25 mile of new

power lines will be conducted within 2 weeks of construction to determine presence of nesting pairs. If nesting plovers are present, construction will cease until all chicks fledge from the site.

- Power providers will install anti-perching measures on all structures within 0.1 mile of either side of the proposed crossings of the Platte, Elkhorn, Niobrara, Cheyenne, Yellowstone, Milk and Missouri rivers.
- Should potentially suitable breeding or foraging habitat for piping plover be identified near the proposed Project at a later time, power lines near breeding habitat (and within 0.25 mile of each side) and lines that will be built between rivers and sand and gravel mining areas will be marked with BFDs to reduce potential injury or mortality to piping plovers.
- Power lines will be routed to avoid construction within 0.50 mile of potentially suitable piping plover nesting habitat in alkali wetlands in Montana.
- NorVal Electric Cooperative will install BFDs in all locations where the power line to PS-10 comes within 0.25 mile of either side of the Milk River. Additionally, BFDs will be installed for 0.25 mile on either side of two unnamed reservoirs crossed by the proposed power line to PS-10.

3.3.2.4. Effects of the Action

Pipeline Construction

The piping plover is known to nest within or near the proposed Project at the Platte and Niobrara rivers in Nebraska and in the Fort Peck Reservoir in Montana. The proposed crossing of the Yellowstone River in Montana also approaches suitable habitat, although the likelihood of piping plover within 0.25 mile of the proposed pipeline crossing is low due to the lack of observations closer than 12 miles from the proposed crossing. No effects on the piping plover or its breeding habitat would be anticipated at the Niobrara, Elkhorn, and Platte rivers since pipeline placement across the rivers would be completed using the HDD method. Additionally, based on coordination with the USFWS, no effects are anticipated along the proposed-Project route in Montana (AECOM 2009a).

Temporary effects during construction could result from increased noise and human presence at work site locations if nesting plover are located within 0.25 mile of the proposed Project and could potentially lead to increased alert behaviors and decreased fledging rates and time spent foraging and brooding (USFWS 2016a). Up to 2 weeks prior to construction-related activities, including HDD and hydrostatic testing that would occur within 0.25 mile from potential breeding habitat, Keystone will conduct presence/absence surveys, in coordination with the USFWS, to identify active nest sites. If occupied breeding territories and/or active nest sites are identified, the USFWS will be notified and appropriate protection measures will be implemented on a site-specific basis in coordination with the USFWS. To help avoid behavior disruption, use of down-shielding on lights will be used should night HDD work be planned during nesting season where an active colony is located within 0.25 mile from the proposed HDD site and vegetative screening is lacking.

Because construction would not take place within piping plover habitat, the primary constructionrelated effects would be noise-related disturbance and potential exposure to small fuel spills and leaks from construction machinery. The effect of construction-related spills reaching piping plover habitat would be minimal. According to Keystone's CMRP (Appendix B), "the contractor shall not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating within 100 feet of any waterbody. The contractor shall not refuel construction equipment within 100 feet of any waterbody. If the contractor must refuel construction equipment within 100 feet of a waterbody, it must be done in accordance with the requirements outlined in the CMRP Section 3. All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands. All equipment parked overnight shall be at least 100 feet from a watercourse or wetland, if possible. Equipment shall not be washed in streams or wetlands." Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials. Keystone has committed to conducting surveys before construction begins if construction activities occur during the nesting season.

Limited human access would be required within the riparian areas of these rivers in order to use the Tru-Tracker® cable that is associated with the drilling equipment and in order for equipment to access these rivers to potentially withdraw water for HDD and hydrostatic tests for the proposed Project. No effects are anticipated, as construction activities, including HDD activities, will not occur if piping plovers are identified during daily pre-construction surveys, as outlined in Section 3.3.2.3 above. Drilling equipment pads and staging areas for HDD would have required set-backs from the riparian zone in each river and would be determined during the federal, state, and local permitting processes. Setbacks can vary from 50 to 100 feet, depending on the river and local jurisdictions.

Temporary effects could result from increased noise and human presence at work site locations if nesting piping plovers are located within 0.25 mile of the proposed Project (USFWS 2012b). Just prior to beginning construction-related activities within 0.25 mile from nesting piping plovers, Keystone will to conduct presence/absence surveys to identify active colony and nest sites, in coordination with the USFWS. If active colonies and nest sites are identified, the USFWS will be notified and appropriate protection measures implemented on a site-specific basis in coordination with the USFWS. These protection measures may include temporarily delaying work until young have fledged the nest or making modifications to the pipeline corridor, if possible. Situations in which delaying work may be impossible could include the withdrawal of water from a major river for hydrostatic testing of the pipeline to comply with seasonal permit restrictions for withdrawal, or commencement of an HDD installation to ensure that work is completed prior to the end of the construction season. Should nighttime HDD work occur, lights would be down-shielded to help avoid disruption of behavior. If piping plovers are documented within the construction corridor, proposed conservation measures would ensure minimal effects on either nesting adults or fledglings:

Temporary withdrawals of water (e.g., for hydrostatic pipeline testing) have some potential for effects on potentially suitable nesting and foraging habitat for this species. However, implementation of conservation measures as outlined in Keystone's CMRP and the requirements

found in Appendix Z of the 2014 Final SEIS would help minimize effects, and these effects, if any, will be insignificant and discountable. Specifically, only the volume of water needed will be withdrawn, withdrawals will be limited to less than 10 percent of daily base flow, and the water will be returned back to its source at the conclusion of hydrostatic testing. Furthermore, temporary effects on downstream water quality would also be avoided by the measures described in Keystone's CMRP and the requirements found in Appendix Z of the 2014 Final SEIS.

Operations

Similar constraints and/or mitigation measures mentioned above may apply to any pipeline maintenance activities.

There are no known occurrences of piping plovers nesting within the action area; therefore, effects during aerial and ground surveillance are unlikely to disturb nesting plovers. Surveillance is conducted 26 times per year at intervals no greater than 3 weeks; the aircraft passes by an area quickly at an altitude of about 1,000 feet during those aerial patrols.

Lighting is not expected to affect the piping plover since only one bulb would be used at each pump station above the entry door, none of which are located closer than 5 miles to a river providing potentially suitable habitat. Communication towers would be below the height that requires lighting by the Federal Aviation Administration and below the height where guy wires would be required for tower stability.

All river crossings that provide potentially suitable nesting habitat or migration stopover habitats would be crossed using HDD. There is limited information on the effects of pipeline temperatures in relation to surface water and wildlife. Because the depth of the pipeline is buried greater than 25 feet below the river bottom using the HDD construction method, temperature effects are expected to be negligible. According to Keystone's Pipeline Temperature Effects Study (see Appendix E), the pipeline does have some effect on surrounding soil temperatures, but the burial depth under rivers crossed using HDD would avoid any temperature effects on potentially suitable habitats with the potential for use by piping plovers.

Emergency repairs and other maintenance activities are not likely to result in temporary or permanent effects on the piping plover. Although the frequency, location, and extent of such activities cannot be predicted with certainty, no effects on piping plover would be expected as major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for HDD crossings. Should emergency repairs be required at major river crossings, HDD methods would be used and potentially suitable habitat for piping plovers would be avoided.

Potential Spills

The spill risk would be almost identical to that described for the interior least tern because the piping plover uses similar habitat (see Section 3.2.2.4).

Any major rivers that could contain potentially suitable piping plover habitat at the planned crossing or downstream would be crossed using HDD methods that would result in a burial depth

of 25 feet or more below the river bottom. In the event of a release, the crude oil would need to penetrate at least 25 feet of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and the potential for exposure. Additionally, these major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195) and require heavier wall pipe be used for the HDD method. As a result, it is highly unlikely that a release from the pipeline would occur coincident with these locations. Outside of HDD locations, the pipe would be standard thickness pipe and would be buried to the usual minimum depth (see Appendix C). Considering that proposed HDD entry and exit points are all more than 300 feet from major rivers and that a small spill is expected to spread radially no more than 150 feet (see Appendix C), only a medium spill or larger would likely spread far enough to reach a major river; the likelihood of such a spill reaching a major river is estimated at approximately 0.004 times per year.

Spills or leaks may occur at or near crossings of tributaries, potentially leading to oil being transported downstream. However, contamination in small, low-flow waterbodies would generally occur at the point of the release because of the inability of the waterbody to transport and dilute the contaminants. Therefore, oil is not likely to reach nesting or foraging habitat. Furthermore, oil in a river that contains potentially suitable nesting habitat is unlikely to physically contact any nesting habitat, because nesting habitat is limited to high-elevation sand bars that remain above the water level for the entire nesting season (USACE 2011).

If a significant release were to occur, federal and state laws would require cleanup. If the pipeline were transporting dilbit at the time of a release to a river, cleanup may require specialized methods, possibly including dredging, based on the tendency of dilbit to sink in water. Submerged dilbit could result in a persistent source of contamination because of the slow rate of natural degradation of this material. Thus, submerged dilbit could result in the slow release of dissolved hydrocarbons, resulting in long-term effects on organisms. Removal of submerged product from the water column can be a difficult and long process, as observed in the response and cleanup efforts related to the July 2010 release in Marshall, Michigan, to the Kalamazoo River. Cleanup efforts to remove the submerged oil from that river, including dredging, excavation, and aeration, continued for 4 years after the spill (Parker 2014). Lighter or less viscous oils may spread more rapidly than dilbit, but may be more amenable to recovery and natural degradation.

Direct contact with a crude oil spill could result in effects on piping plover due to oiling of plumage; crude oil ingestion from contaminated plumage or water; bioaccumulation of certain components of the spilled product entering plover via ingested prey; and crude oil transfer to eggs and young, possibly resulting in mortality, reduced hatching success, deformities, or developmental delays. The magnitude of spill effects varies with multiple factors, the most significant of which include the amount of material released, the size of the spill dispersal area, the type of spills, the species assemblage present, climate, and the spill response tactics employed.

While these exposure routes have the potential to cause effects on individuals, effects on piping plover are highly unlikely due to the low probability of a spill contacting suitable habitat.

Power Infrastructure

Piping plovers are susceptible to collisions with power lines. However, none of the power lines would cross the major rivers discussed above, or any potentially suitable piping plover habitat. As a precautionary measure to conserve several bird species, BFDs will be installed in all locations where the power line to PS-10 comes within 0.25 mile of either side of the Milk River. Additionally, BFDs will be installed for 0.25 mile on either side of two unnamed reservoirs crossed by the proposed power line to PS-10. The power line to PS-10 in Valley County, Montana, also crosses the Fort Peck dam, although not the Missouri River itself. The new power line would be installed on the existing towers that cross along the top of the dam, adding an insignificant risk of additional collisions given the current presence of the power line on the landscape.

Some potential for increased predation on nesting piping plover may exist as a result of increased raptor perching opportunities provided by new power lines and support structures. Predation is thought to be a factor limiting reproductive success in some areas and appears to be linked to the lack of high-quality nesting habitat (USFWS 2016a). However, as described above, only the power line to PS-10 is located within 1 mile of potentially suitable piping plover nesting habitat, and that nesting habitat is absent within 0.25 mile of the power line, likely precluding successful predation on nesting piping plovers or chicks, if present, by raptors perched on the new power line (Wuczyński 2005).

In summary, the proposed power line in Montana to PS-10 could result in long-term increases in piping plover collisions and predation on nesting terns and chicks. However, since 1) a portion of the power line for PS-10 would be strung on existing structures, 2) BFDs will be installed in all locations where the power line to PS-10 comes within 0.25 mile of either side of the Milk River and within 0.25 mile on either side of two unnamed reservoirs, and 3) no potentially suitable piping plover nesting habitat is located within 0.25 mile of the power line, increased collision and predation risks would be insignificant and discountable. All other proposed power lines would be located more than 1 mile away from suitable habitat. Overall, with implementation of conservation measures (Section 3.3.2.3), it is expected that the proposed power infrastructure, including that owned by or subject to the decisions of WAPA, financed by RUS, or crossing BLM or USACE lands would have only insignificant effects on the piping plover.

3.3.2.5. Cumulative Effects

The Proposed Federal Decisions have the potential to effect the piping plover within its range in Nebraska, South Dakota, and Montana. Individual piping plovers could be disturbed by construction activities during the nesting season along potentially suitable habitat at major river crossings in the action area. Additionally, individuals may be disturbed during spring and fall migration. However these effects, if any, are not expected to occur due to the use of USFWS approved conservation measures, including the use of HDD at major river crossings and preconstruction surveys for piping plover during the nesting season, as described above. The proposed power lines associated with the proposed Project also have the potential to affect migrating least terns throughout the life of the proposed Project. These effects, if any, are unlikely to occur as

none of the proposed power lines cross major rivers providing potentially suitable habitat for least terns.

Future non-federal projects reasonably certain to occur within the action area that also may disturb individuals and/or convert potentially suitable riverine habitat include pipeline, power line, and road development, as well as actions that affect aquatic habitat including projects that require significant groundwater withdrawals, gravel removal, and conversion of natural habitats to livestock grazing in/near major rivers. These types of projects all have the potential to result in effects on interior least terns and/or their habitat. Additionally, the accidental spread of invasive exotic aquatic plants and animals have the potential for effects on potentially suitable habitat.

If construction activities associated with the above types of future projects occur in or near potentially suitable habitat during the piping plover nesting season, the potential exists for disturbance of individuals if project activities are conducted without project-specific coordination with applicable resource agencies and incorporation of approved conservation measures specific to piping plovers. Effects on individuals not expected to occur during spring or fall migration. Habitat and disturbance effects at major river crossings resulting from future projects would likely be lessened through incorporation of similar conservation measures to avoid and minimize effects on this species. As such, cumulative effects, if any, resulting from future non-federal projects, when considered with the effects of the proposed Project considered in this assessment, are expected to be minor.

3.3.2.6. Determination

Effect on Critical Habitat

Critical habitat is designated for the piping plover at Fort Peck Reservoir and on the Missouri River downstream of Wolf Point; this is near, but not overlapping, the action area in Montana. However, based on Keystone's commitment to implement the conservation measures, including implementation of HDD construction techniques, the proposed Project would not affect federally designated critical habitat for the piping plover.

Effect on the Species

The proposed Project "<u>may affect, but is not likely to adversely affect</u>" the piping plover. This determination is based on Keystone's construction plan to use HDD to cross the Platte, Elkhorn and Niobrara rivers, coordination with the USFWS, Keystone's commitment to follow conservation measures identified above, and power providers' commitments to follow conservation measures identified above.

Although new electric power lines could potentially increase the collision potential for piping plover, none of the proposed power lines would overlap suitable nesting or foraging habitat. Few studies have focused specifically on piping plover, so the level of potential hazard is not known (Shriner 2007; USFWS 2004, 2016a). The USFWS recommends installing BFDs on power lines near wetlands and water bodies within the whooping crane migration corridor, which would overlap most of the range of the piping plover in the proposed-Project area. While the installation of BFDs would reduce, but not eliminate, the risk of piping plover collision with power lines, if

any, the proposed power lines would not cross any areas of potentially suitable habitat for breeding piping plovers; therefore, the risk of collision is minimal. Considering the initial siting of the proposed power lines, and secondary benefits of whooping crane conservation measures (i.e., BFDs) that would be implemented, expected effects on this species would be insignificant and discountable.

Although it is possible that a spill event could result in an adverse effect on piping plovers, the probability of such an event would be unlikely due to the low probability of a spill, the low probability of a spill in a river reach where and when piping plovers are present, and the low probability of the spill reaching a major river in sufficient amounts to cause toxic effects. In the unlikely event of a leak, the crude oil would need to penetrate a significant amount of overburden before reaching the river, thereby reducing the risk in some cases of crude oil reaching the river and the potential for exposure.

3.3.3. Rufa Red Knot—Threatened

3.3.3.1. Natural History and Habitat Association

The rufa red knot was federally listed as a threatened species on December 11, 2014. The species is generally restricted to ocean coasts during winter and occurs primarily along the coast during migration, however, a small number of migrants are reported across the interior of the United State during spring and fall migration (eBird 2019; Jorgensen 2014). With the exception of a few, primarily saline, lakes in the northern Great Plains, there is no evidence that rufa red knots use non-coastal habitats as stopover sites (Central Flyway Council 2013).

Species data obtained from the USFWS, state heritage programs, and eBird are consistent with the Central Flyway Council's observation that, "the Red Knot is a species of casual or irregular occurrence within the non-coastal portion of the Central Flyway. A relatively small number of records exist for each state during the knot's spring and fall migration, but there are no locations that are used annually or frequently as stopover sites" (Central Flyway Council 2013). Based on these data, there is no evidence that this species uses non-coastal sites proximal to the proposed Project as traditional stopover locations.

Most rufa red knot migrate along the eastern coastline, feeding on mollusks and softer invertebrate prey (Piersma and van Gils 2011; Harrington 2001). The primary locations for these types of food sources are coastal marine and estuarine habitats with exposed intertidal sediment, sand, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments and lagoons (Cohen et al. 2010; Cohen et al. 2009; Niles et al. 2008; Harrington 2001; Truitt et al. 2001). Since long-distance migrants, such as the rufa red knot, are highly dependent on quality food sources at specific stopover points, they typically congregate in areas where abundant food is consistently available (Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Rufa Red Knot (Calidris canutus rufa); Proposed Rule, 78 Fed. Reg. 189 [September 30, 2019]).

Although small numbers of rufa red knots are reported annually across the interior United States during spring and fall migrations, there is no evidence that this species uses non-coastal sites proximal to the proposed Project as traditional stopover locations. Non-coastal traditional stopover

locations exist around Lake Erie, Lake Michigan, and Lake Ontario in the Midwest, and potentially on a much less frequent basis at smaller sites such as Cheyenne Bottoms National Wildlife Refuge in Kansas (eBird 2018). The USFWS notes that some information "suggests that some rufa red knots likely use inland saline lakes as stopover habitat in the Northern Great Plains. We have no information to indicate whether rufa red knots may also use inland freshwater habitats during migration" (Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot; Final Rule, 79 Fed. Reg. 238 [December 11, 2014]). Those inland saline lakes in the Northern Great Plains include Quill Lake, Chaplin Lake, Reed Lake, and Old Wives Lake in southern Saskatchewan (Gratto-Trevor et al. 2001; Nature Saskatchewan 2014; Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot; Final Rule, 79 Fed. Reg. 238 [December 11, 2014]). Rufa red knot use of other stopover habitat in the Northern Great Plains is less consistent and may vary between years depending on water level and prey availability (Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot; Final Rule, 79 Fed. Reg. 238 [December 11, 2014]); only small numbers of migrant rufa red knot have been observed through the Great Plains within the United States (Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the Rufa Red Knot (Calidris canutus rufa); Proposed Rule, 78 Fed. Reg. 189 [September 30, 2019]). In general, the 500- to 600-mile-wide central flyway that includes the proposed Project is consistently used by some rufa red knot, but stopover locations may vary depending on conditions such as water levels and prey sources (Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot; Final Rule, 79 Fed. Reg. 238 [December 11, 2014]). Some geolocator data also indicate that rufa red knot fly directly from Canada to Texas without stopping (Fitzsimmons 2011). No critical habitat has been designated for this species.

3.3.3.2. Potential Presence in Proposed-Project Area

Appendix O, 2014 Northern Long-Eared Bat and Red Knot Habitat Assessment, provides an assessment of potentially suitable rufa red knot habitat within the proposed action area. There are numerous constructed ponds and wetlands within 1 mile of both the pipeline and power line components of the proposed Project. However, ponds and wetlands typically do not provide stopover habitat for rufa red knot as they do not provide adequate mollusk foraging opportunity. There are several farmed playa-type wetlands proximal to proposed-Project components in all three states as well as a few rainwater basin wetlands within 1 mile of the proposed Project in Nebraska. None of these features provide stopover habitat. Farmed playa-type wetlands are not present from year to year and do not support adequate mollusk populations for foraging. Rainwater basin wetlands that have not been drained for agriculture are typically dominated by emergent vegetation and likewise to not support significant mollusk populations for foraging. Overall, potential inland stopover habitat that supports adequate food sources are highly limited in the proposed-Project area and there is very little habitat proximal to the proposed Project that could be used by rufa red knot. The lack of suitable habitat likely explains the paucity of rufa red knot observations in any of the three states.

The SDNHP and NNHP supplied occurrence data for all known records within 1 mile of the proposed Project from in July 2018, and the MNHP database supplied similar records in September

2019. There are no recorded occurrences of rufa red knot within 1 mile of the proposed Project in any of the three states (MNHP 2018; SDNHP 2018; NNHP 2018). However, there is evidence of rufa red knot use between 10 and 30 miles west of the proposed pipeline in Montana at Bowdoin Lake National Wildlife Refuge (ten unique records between 1997 and 2018, eBird 2018), Nelson Reservoir (one unique record, in 2001 [Brees 2001]), and Whitewater Lake (one unique record, in 2005 [Prellwitz 2005]). There are two unique records of rufa red knot in South Dakota from 2016, approximately 46 miles from the proposed Project near the town of Blunt. There are four unique records of rufa red knot in Nebraska between 5 and 30 miles from the proposed Project; the most recent was in 2011, approximately 26 miles from the proposed Project on the Niobrara River, while the closest record was near Columbus in 1986 (eBird 2018).

Montana

The MNHP does not have any record of the species within 1 mile of the proposed pipeline (MNHP 2018). There are two generalized records of rufa red knot at the north end of Fort Peck Lake and it is possible that the power line to PS-10 could be within 1 mile of these two sightings (MNHP 2018). There is also a single record of rufa red knot at Whitewater Lake in northern Montana approximately 1.4 miles from the power line to PS-09 (Prellwitz 2005). There are ten unique records of rufa red knot at Bowdoin Lake National Wildlife Refuge between 1997 and 2018, and one record at Nelson Reservoir from 2001 (eBird 2018). Bowdoin Lake is approximately 5.4 miles west of the proposed power line to PS-09 at the closest point, while Nelson Reservoir is approximately 2.6 miles west at the closest point. Otherwise, the nearest record is at Medicine Lake approximately 84 miles northeast of the proposed Project (MNHP 2018). Overall, there are only 48 observations of the species within the state from pre-1970 to present (MNHP 2018).

Keystone completed an assessment of the potential for rufa red knot to occur proximal to the proposed pipeline or any power line in 2015 (WESTECH 2015); that assessment is still relevant to the pipeline and power line routes in Montana. There is no potential stopover habitat proximal to the proposed pipeline. The only area with the potential for occurrence within 1 mile of the proposed Project is at Austin Lake, which is an ephemeral pothole lake in northern Montana approximately 6.5 miles south of Whitewater Lake, and within 0.1 mile of the power line to PS-09; this power line would affect approximately 0.61 acre of potential rufa red knot stopover habitat. Given the general lack of habitat to support migrating rufa red knot proximal to the action area, and the overall paucity of observations within Montana, the potential for rufa red knot occurrence near the proposed Project is very low.

South Dakota

There are no records of rufa red knot within 1 mile of the proposed pipeline in South Dakota (SDNHP 2018). According to eBird, there are five records of the species within the entire state between 1991 and 2016 (eBird 2018). There are two unique records of rufa red knot in South Dakota from 2016 approximately 46 miles from the proposed Project near Blunt (eBird 2018).

Keystone completed an assessment of the potential for rufa red knot to occur proximal to the proposed pipeline or any power line in 2015 (WESTECH 2015); that assessment is still relevant to the pipeline and power line routes in South Dakota. There is no potential stopover habitat

proximal to the proposed pipeline. The only potentially suitable habitat occurs at small ephemeral lakes proximal to or crossed by proposed power lines. One lake occurs along the power line to PS--16, and two lakes occur along the power line to PS-18; these power lines would affect approximately 2.04 acres of potential rufa red knot stopover habitat. All of these lakes are more than 100 miles away from the two rufa red knot records near Blunt, South Dakota. Given the general lack of habitat to support migrating rufa red knot proximal to the action area, and the very limited observations within South Dakota, the potential for rufa red knot occurrence near the proposed Project is very low.

Nebraska

There are no records of rufa red knot within any township crossed by the proposed pipeline in Nebraska, either on the MAR or non-MAR portion of the route (NNHP 2018). There are six eBird records of rufa red knot in Nebraska between 1967 and 2011. One record from 1986 occurs approximately 6.5 miles west of the proposed pipeline near Columbus, Nebraska, while a second record from 1995 occurs approximately 16.5 miles west of the proposed pipeline near McCool Junction, Nebraska. A summary of observations in Nebraska, published by Jorgensen (2014), showed that Lake McConaughy was the only site in that state at which rufa red knot had been recorded more than three times.

Keystone completed an assessment of the potential for rufa red knot to occur proximal to the proposed pipeline or any power line in 2015 (WESTECH 2015); however, that assessment is only relevant for the non-MAR portion of the route in Nebraska. Based on the 2015 assessment as well as a recent review of habitat along the non-MAR route, there is no suitable habitat for rufa red knot within 1 mile of the proposed pipeline route, and based on eBird data there is very little habitat for rufa red knot within Nebraska. The Central Flyway Council notes that as of 2013 there were only 15 records of rufa red knot in Nebraska in over 100 years; there are no more recent observations of rufa red knot in Nebraska based on eBird data (Central Flyway Council 2013; eBird 2018).

In addition to the 2015 assessment, Keystone has reviewed the potential for stopover habitat on the MAR as well as the power line study areas for pump stations on the MAR. As noted above, there are numerous ponds and wetlands and several farmed playa-type wetlands proximal to proposed Project components, as well as a few rainwater basin wetlands within 1 mile of the proposed Project. However, none of these features provide potentially suitable stopover habitat for migrating rufa red knots. Ponds are too deep, wetlands are too heavily vegetated, and the playatype wetlands are farmed and frequently not present in any particular year depending on precipitation. Given the lack of habitat to support migrating rufa red knot proximal to the action area, and the extremely limited observations within Nebraska, the potential for rufa red knot occurrence near the proposed Project is very low.

The USACE may issue verifications in Nebraska under Section 404 of the Clean Water Act for proposed Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project. PCNs are anticipated for other portions of the

proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

3.3.3.3. Conservation Measures

Keystone, or electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the rufa red knot and potentially suitable habitat for the species.

- Crossings of major rivers and riverine habitat will be completed using HDD, resulting in a pipeline burial depth of 25 feet or greater, regardless of the season.
- Keystone will implement measures identified in the HDD contingency plan, including monitoring of the HDD bore, monitoring downstream of the HDD site for evidence of drilling fluids, and mitigation measures should a frac-out occur.
- Keystone will prepare and implement a project-specific SPCC Plan.
- To the extent practicable, construction will occur mostly during daytime hours and will comply with any local noise regulations.
- Construction equipment will be properly equipped with mufflers to lessen noise impacts.
- Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite.
- Refueling of lubrication of construction equipment will occur in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.
- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible.
- Equipment will not be washed in streams or wetlands.
- Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials.
- Water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow.

• Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in their permits. Water will be returned to its source within a 30-day period except where hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.

3.3.3.4. Effect Evaluation

Pipeline Construction

The primary construction-related temporary effects, if any, would be disturbance and potential exposure to small fuel spills and leaks from construction machinery. The effect of construction-related spills within any rufa red knot habitat would be minimal because all hazardous materials such as fuels and oils would be stored at least 100 feet away from surface waters, and these types of spills or leaks generally are small in volume and are cleaned up quickly. According to Keystone's CMRP (Appendix B), hazardous materials, chemicals, fuels, and lubricating oils would not be stored, staged, or transferred (other than possible refueling) within 100 feet of any waterbody, wetland, storm drain, drop inlet, or high-consequence area.

As described above, the rufa red knot occurs sporadically during spring and fall migration. Given that there are no records within 1 mile of the proposed pipeline route, no temporary effects to rufa red knots are expected as a result of Project construction. Further, given that there is no specific and consistent habitat used by migrating rufa red knots on or near the action area, construction-related effects to potentially suitable stopover habitat, including reductions in wetland, riparian, and riverine habitats, would not be expected to result from construction of the proposed Project.

Operations

Aerial surveillance is conducted 26 times per year at intervals no greater than 3 weeks. The aircraft passes by an area quickly at an altitude of about 1,000 feet during those aerial patrols. As there are no known transitory occurrences of rufa red knots within the action area, effects to migrants during aerial and ground surveillance are not expected to disturb migrating knots in the unlikely event that individuals are present during surveillance flights.

Emergency repairs and other maintenance activities are not likely to result in temporary effects on the rufa red knot. Although the frequency, location, and extent of such activities cannot be predicted with certainty, it is extremely unlikely that emergency repairs would overlap with the small amount of potentially suitable stopover habitat for rufa red knots at the time of year that rufa red knots have the potential to occur in the action area. Therefore, such effects on migrating rufa red knots, if any, would be expected to be insignificant and discountable.

Potential Spills

Direct contact with a crude oil spill could result in effects on rufa red knots due to plumage oiling and crude oil ingestion from contaminated plumage and prey, potentially resulting in injury or mortality. While these exposure routes have the potential to cause effects on individuals, the probability of effects on rufa red knot is extremely low due to the low probability of a spill and the low probability of the presence of rufa red knot individuals in the affected area. The magnitude of spill effects varies with multiple factors, the most significant of which include: (1) the amount of material released, (2) the size of the spill dispersal area, (3) the type of spills, (4) the species assemblage present, (5) climate, and (6) the spill response tactics employed. Overall, the rarity and transient nature of this species makes it unlikely to encounter a spill.

Power Infrastructure

Rufa red knot stopover habitat proximal to the proposed Project is very limited; only 2.7 acres overlap the proposed power infrastructure to PS-09, PS-16, PS-18, and PS-20. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, where available, was also used to determine the extent of potential habitat near the proposed Project.

Given that rufa red knots typically make non-stop, direct migratory flights and very little potentially suitable habitat exists within the action area, rufa red knots would not be expected to encounter the proposed power lines associated with the proposed Project. A recent geolocator study showed that 7 rufa red knots departing Texas used the central flyway across the mid-continental United States. All of these birds either made a 2-day direct flight to a stopover site in the Northern Great Plains or a 3-day direct flight to southern Hudson Bay in Manitoba, Canada (Newstead et al. 2013). However, during periods of inclement weather, migrating rufa red knots may be forced to stop during long-distance migratory flights. While the rufa red knot is known to have good visual perception and maneuverability, avoidance of obstacles may be reduced during periods of poor visibility, high winds, or inclement weather (USFWS 2014e). In the unlikely event that a migrating rufa red knot does encounter a power line associated with the proposed Project, the installation of BFDs and other conservation measures detailed above, including those in Sections 3.2.2.3, 3.2.3.3, and 3.3.2.3 would reduce the risk of effects on the rufa red knot from the proposed power infrastructure, including that owned by or subject to the decisions of WAPA, financed by RUS, or crossing BLM or USACE lands, to a negligible level.

3.3.3.5. Cumulative Effects

The proposed Federal Decisions have the potential to result in temporary effects on the rufa red knot within its migratory range in Montana, South Dakota, and Nebraskan. However, effects, if any, are highly unlikely to occur given the general lack of known occurrences and the lack of potentially suitable habitat within the action area.

Future non-federal projects reasonably certain to occur within the action area that also may disturb individuals and/or convert potentially suitable habitat include pipeline, power line, residential and/or commercial development, road development, and oil and gas exploration and development projects, as well as actions that convert natural habitats to agricultural production. These types of projects all have the potential to result in temporary effects on the rufa red knot and potentially suitable stopover habitat.

Given the lack of occurrences of rufa red knots within the action, the general lack of potentially suitable stopover habitat, and the limited amount of time that individuals spend in the action area

during spring and fall migration, cumulative temporary effects on individuals would not be expected to occur as a result of future non-federal actions.

3.3.3.6. Determination

Effect on the Species

The proposed Project, and therefore, the Proposed Federal Decisions, "<u>may affect, but is not likely</u> <u>to adversely affect</u>" the rufa red knot. This determination is based on (1) the proposed pipeline would not affect stopover habitat; (2) there is very little potentially suitable stopover habitat proximal to the proposed power lines; (3) rufa red knot are extremely uncommon in the Central Flyway; and (4) the increase in power lines associated with pump stations is 0.1 percent of existing large power lines, there would be no measurable effect on the rufa red knot as a result of the proposed Project.

3.3.4. Western Prairie Fringed Orchid—Threatened

3.3.4.1. Natural History and Habitat Association

The western prairie fringed orchid was listed as federally threatened on September 28, 1989 (Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Eastern and Western Prairie Fringed Orchids, 54 Fed. Reg. 187 [September 28, 1989]). This plant is an erect, stout herbaceous perennial that historically occurred throughout the tallgrass prairies of southern Canada and the central United States west of the Mississippi River (USFWS 1996; Sieg and King 1995). A 60 percent decline is attributed to the conversion of much of the tallgrass prairie to agricultural land (USFWS 1996). The western prairie fringed orchid is presently known to occur in six states (Iowa, Kansas, Minnesota, Missouri, Nebraska, and North Dakota) and Manitoba, Canada (USGS 2006; USFWS 1996). No known populations of the western prairie fringed orchid are known to exist in South Dakota, but this may be due to the lack of surveys in some areas and denied access to some private land (USFWS 2012). Tripp County, South Dakota, has much potential habitat for the species (USFWS 2012). Most remaining populations are found in North Dakota and Minnesota, with about 3 percent of the populations found in the southern portion of this plant's historical range (USFWS 1996).

Pollination appears to be dependent on a specific group of moths known as hawkmoths (Sphingidae) (Phillips 2003; Sieg and King 1995; Sheviak and Bowles 1986). This relationship has been difficult to document (Phillips 2003). The long nectar spur of western prairie fringed orchid, the longest of any orchid in North America, requires its pollinators to have long enough tongues and widely spaced eyes to allow them to harvest the pollen (Phillips 2003). Based on historical documents, hawkmoths that may be possible pollinators include *Eumorpha acemon*, *Hyles lineata*, *Sphinx drupiferatum*, *S. kalmiae*, *Catacola* sp., *Ceratomia undulosa*, and *Hyles galli* (USFWS 1996). While western prairie fringed orchids are pollinator-specific, the hawkmoths have other nectar sources (Phillips 2003; USFWS 1996). It is theorized that a lack of suitable pollinators could contribute to the observed low pollination rates, which may affect the long-term survival of the western prairie fringed orchid (Phillips 2003).

The western prairie fringed orchid is most commonly found in moist, undisturbed mesic to wet calcareous prairies, sedge meadows, and mesic swales (Phillips 2003; Sieg 1997; USFWS 1996). Populations of western prairie fringed orchids vary dramatically between wet and dry years, with increases in wet years, and decreases in dry years (Sieg and Wolken 1999). Soil moisture appears to be the most significant factor in the survival of individual orchids and the number of orchids flowering in a given year (USFWS 2007; Phillips 2003; Sieg 1997; Sieg and King 1995). Periodic fires and bison grazing were common in the historical range of the western prairie fringed orchid (Sieg and Bjugstad 1994), but it is unclear how fire or grazing may have affected the species (USGS 2006). No critical habitat has been designated for this species.

The spread of invasive plants into prairie swales has had a negative effect on western prairie fringed orchid populations (Sieg 1997; USFWS 2007). Invasive plants that may displace the western prairie fringed orchid through competition include leafy spurge, Kentucky bluegrass (*Poa pratensis*), and Canada thistle (*Cirsium arvense*) (Sieg 1997; USFWS 2007). Other threats to the long-term survival of western prairie fringed orchid include the use of herbicides, heavy livestock grazing, early haying, habitat fragmentation, river channelization, siltation, water depletions, and road and bridge construction (Minnesota Department of Natural Resources 2007; USGS 2006; USFWS 2012).

3.3.4.2. Potential Presence in Action Area

There is no potential for this species to occur on BLM-managed lands, USACE-managed lands, or WAPA-owned lands involved in the Proposed Federal Decisions. There is the potential for this species to occur along the proposed power line PS-21, which involves decisions by WAPA and RUS. This species may also occur along other portions of the proposed Project, although it is unlikely. The USACE may issue verifications under Section 404 of the Clean Water Act for proposed-Project activities involving dredging or filling in rivers, streams, or wetlands. USACE anticipates receiving PCNs under Nationwide Permit 12 from Keystone once Section 7 ESA consultation is completed with USFWS. Additional PCNs may be submitted for USACE review along other portions of the proposed Project for USACE review, including those that would cross wetlands and waters within the proposed pipeline corridor in Nebraska.

The western prairie fringed orchid is known to occur in Nebraska and Kansas (NatureServe 2009) and is likely to occur in South Dakota, given the availability of suitable habitat, especially south of Highway 18 in Tripp County, South Dakota (USFWS 2012). In Nebraska, populations are known to occur in Boone, Cherry, Dodge, Garfield, Grant, Greeley, Hall, Holt, Lancaster, Loup, Madison, Otoe, Pierce, Rock, Saline, Sarpy, Seward, and Wheeler counties, and may occur at other sites in Nebraska (AECOM 2008a). In addition, the NNHP also has records of the orchid documented in Keya Paha and Stanton counties (2019). Populations in South Dakota are possibly extirpated (NatureServe 2009), but factors that indicate the species could still be present include incomplete surveys in areas of suitable habitat crossed by the proposed-Project route on private lands, and erratic flowering patterns with long dormancies that make detection difficult (Phillips 2003).

Surveys for the species during the flowering season have been completed in suitable habitat, or potentially suitable habitat, along the proposed pipeline route in South Dakota in 2009, 2011, 2012, 2013, and 2018. Surveys have been completed along the non-MAR portion of the proposed pipeline route within the range of the western prairie fringed orchid in Nebraska and South Dakota in 2009, 2011, 2012, 2013, and 2018, and along the MAR in 2018. In July 2019, surveys were completed at two sites north of the Platte River that were identified in 2018, as well as at newly identified fair quality habitat south of the Keya Paha River along the MAR. No individuals or populations of western prairie fringed orchid were observed along any current proposed pipeline route (Appendix Q, 2013 Western Prairie Fringed Orchid Habitat Survey; Appendix R, Addendum to the 2013 Western Prairie Fringed Orchid Habitat Survey; Appendix S, Western Prairie Fringed Orchid and Small White Lady's Slipper Habitat Survey Report Nebraska Mainline Alternative Route; Appendix T, 2018 Western Prairie Fringed Orchid and Small White Lady's Slipper Survey Report; and Appendix U, Updated 2018 Habitat Report for Western Prairie Fringed Orchid).

Based on field surveys completed in 2019 and previous years, suitable habitat is present along portions of the proposed pipeline route in Tripp County, South Dakota; and Keya Paha, Boyd, Holt, Antelope, and Colfax counties Nebraska. The western prairie fringed orchid would be assumed to be present if suitable habitat is present but access to survey for the species was denied. Spring and summer 2018 surveys along the MAR identified three to five locations of suitable habitat north of the Platte River crossing (Appendix S).

Suitable habitat includes mesic and wet prairies, although plants have also been found in roadside ditches and hay meadows (Sheviak and Bowles 2003; USFWS 2011b; USFWS 1996). This species is typically found in unplowed calcareous prairies and sedge meadows and wet mesic or mesic prairies in swell and swale topography or on gentle slopes. Soil surface moisture in the top 3.9 inches of neutral to slightly alkaline soils of fertile sandy loam, clay loam, or loam is critical to the western prairie fringed orchid. Moisture is found in the top 0.8 inches of soil 24 to 52 percent of the time where blooming orchids are found (Wolken et al. 2001). Some of the best associated vegetative indicators are *Juncus balticus*, *Eleocharis* sp., *Aster lanceolatus*, and *Anemone canadensis* (Wolken et al. 2001).

Based on these habitat descriptions and field indicators, habitat was evaluated by pedestrian survey and rated according to the following criteria (see Appendix Q, Appendix R, Appendix S, and Appendix T):

- Excellent—completely or dominated by native tall-grass/lowland/mesic prairie, appears to be mowed or lightly grazed every year or two. Suitable hydrology present.
- Good—primarily native tall-grass/lowland/mesic prairie, appears to be hayed or lightly grazed every year or two. Suitable hydrology present.
- Fair—mix of native tall-grass/lowland/mesic prairie and non-native vegetation, appears to be hayed or lightly grazed approximately every year or two. Suitable hydrology present.
- Poor—primarily non-native vegetation with a minor native tall-grass/lowland/mesic prairie component, appears to be hayed or lightly grazed every year or two, or a mix of native and

non-native plant species but heavily grazed and/or sprayed to reduce broadleaf species. Suitable hydrology present.

Table 3.3-3 quantifies western prairie fringed orchid habitat within the proposed pipeline's construction and operation footprints by habitat quality. It is possible that additional suitable habitat occurs along the proposed pipeline in areas where access has been denied.

 Table 3.3-3
 Western Prairie Fringed Orchid Habitat within Proposed Pipeline System

Affected Acres ^a				
Habitat Quality	Construction ^b	Operation ^c		
Excellent ^d	6.71	2.88		
Good	51.67	21.53		
Fair	22.54	9.98		
Poor	53.63	10.84		
Total Habitat	134.55	45.23		

^a Acreage derived from Keystone (2018c, 2019).

^b Construction acreage consists of pipeline centerline permanent/temporary easement, additional temporary workspace, access road easements, and auxiliary sites.

^c Operation acreage consists of pipeline permanent easement only

^d This site occurs approximately 1 mile north of the Platte River and is dominated by native prairie species throughout much of the survey area. Non-native species such as meadow fescue (*Schedonorus pratensis*) and red top (*Agrostis stolonifera*) are present, and sometimes dominant, but often in discrete areas within an overall native community. Subsequent survey of the site in late summer revealed additional dominance of warm-season native grasses such as big bluestem (*Andropogon gerardii*) and switchgrass (*Panicum virgatum*). Further, the common orchid, nodding lady's tresses (*Spiranthes cernua*) was often noted in September indicating that hydrology and mycorrhizal conditions are suitable for orchids. Based on all these observations, this site was conservatively categorized as Excellent overall, although areas of Good habitat, and even limited areas of Fair habitat, are present within the overall vegetation community.

Areas of good and excellent habitat do occur along the proposed pipeline route in townships where western prairie fringed orchid has not been recorded (e.g., habitat near MP 780.2). There are no known populations of western prairie fringed orchid near the MP 780.2 site. The closest documented populations occur in Hall County along the Platte River approximately 80 miles southwest of the habitat near MP 780.2 or in Lancaster County approximately 40 miles southeast of this habitat. The western prairie fringed orchid does occur in Holt, Antelope, and Madison counties. Only one area of good habitat in Antelope County was documented along the proposed pipeline route, although others could occur in areas without survey access. Based on the small amount of good or excellent habitat along the pipeline route in counties where the species is known to occur, and the distance between known populations of western prairie fringed orchid and the excellent habitat north of the Platte River in Colfax County, it is unlikely the species would be present within the pipeline ROW.

Element occurrence or record requests were made from the SDNHP and the NNHP for any records of western prairie fringed orchid within 1 mile of the action area, including the pipeline, power infrastructure, and ancillary facilities. There are no records of the species within 1 mile of the action area in South Dakota (SDNHP 2018). The NNHP returned occurrences within townships (36 square miles) that are intersected by the action area (NNHP 2018); NNHP did not provide more precise location data. Based on NNHP data, there are two occurrences of western prairie fringed orchid within townships crossed by the action area, at T22NR01W and T33NR16W.

Township T22NR01W lies along the proposed pipeline route between approximately MP 739.9 and MP 747.4 near Madison, Nebraska. Pedestrian field surveys did not identify any potential western prairie fringed orchid habitat in this area in May and June 2018; consequently, the area was not surveyed for the species during the flowering period in July 2018. The majority of the habitat crossed by the proposed Project in T22NR01W, as well as the majority of the habitat in the township, is cultivated or includes small areas of non-native pasture dominated by smooth brome (*Bromus inermis*).

Township T33NR16W occurs between approximately MP 622.3 and MP 625.6 north of the Niobrara River. One area of potentially suitable habitat rated as Fair was observed in 2013 and was surveyed in July 2018, at which time no western prairie fringed orchids were observed.

A preferred route for the power line to PS-21 has been designed from near Gregory, South Dakota, to PS-21. Maps dated November 29, 2018, depicting potentially suitable habitat along planned power lines were provided by Keystone and are included in Appendix F, Habitat Mapping along Transmission Lines. Supplemental information, is provided in Appendix U, Updated 2018 Habitat Report for Western Prairie Fringed Orchid. SDNHP data do not record western prairie fringed orchid within 1 mile of the power line route (SDNHP 2018). Based on a review of recent aerial imagery, land cover data, and soil survey data, the majority of the habitat along the power line is cultivated hayland or rolling pasture on droughty soils that do not support suitable hydrology for western prairie fringed orchid. The route does not cross any sub-irrigated meadows of tall grass prairie or mesic prairie. The route does cross approximately 0.4 acres of small drainages and wetlands that may provide potentially suitable habitat for the species. However, these features would likely not be disturbed by construction; rather they would be spanned and the utility poles placed outside the wetland boundary. Regardless, based on pedestrian surveys in the proposed pipeline route near this power line, wetlands along small drainages and surrounding ponds are typically dominated by reed canarygrass (*Phalaris arundinacea*) with the surrounding banks typically dominated by smooth brome or Kentucky bluegrass. The likelihood of western prairie fringed orchid along the proposed power line route to PS-21 is low.

Proposed power line routes to PS-22 through PS-25 have not been surveyed for the western prairie fringed orchid. For the power line route to PS-22, the local power providers would complete preconstruction field surveys for the western prairie fringed orchid during the appropriate bloom periods in areas of potentially suitable habitat within the NNHP-identified range of this species. Although the routes have not yet been surveyed, all of the power line corridors fall within townships that were queried by the NNHP for western prairie fringed orchid presence. Western prairie fringed orchid was not documented in any township that contains a power line corridor. Aerial imagery and publicly available vegetation and soils data were reviewed to assess the potential for suitable habitat along the proposed power lines to PS-22, PS-23B, PS-24, PS-25, and PS-26 (Homer et al. 2015; Soil Survey Staff 2018).

Similar to habitat along the power line route to PS-21, habitat within the power line route to PS-22 near O'Neill, Nebraska, is composed of cultivated land, primarily center-pivot agriculture and dry, rolling, upland pasture interspersed with small, non-wetland drainages. Based on pedestrian surveys on the proximal pipeline route, some of these pastures contain native species such as

porcupinegrass (*Hesperostipa spartea*) or little bluestem (*Schizachyrium scoparium*), neither of which is particularly indicative of western prairie fringed orchid habitat, as they typically grow in sites that are too dry for the orchid. Further, many of the pastures are invaded by smooth brome. The likelihood of western prairie fringed orchid occurring within the proposed power line corridor to PS-22 is low.

Based on aerial imagery, land along the proposed power line route to PS-23 near Neligh, Nebraska, is highly disturbed. The majority of the habitat within the corridor is cultivated, although roadside ditches and small grassland or forested patches occur. Wetlands are not likely to occur in this corridor. In earlier surveys of the proposed pipeline corridors, the closest places with possible habitat were approximately 2.9 miles (Appendix R) and 6.7 miles (Appendix T) from the proposed power line route to PS-23. It is unlikely that the western prairie fringed orchid would occur in the proposed power line corridor to PS-23.

Habitat within the power line corridors to PS-23B near Leigh, Nebraska, and PS-24 near Bellwood, Nebraska, is highly disturbed. The majority of the habitat within the PS-23B corridor is cultivated, although small pastures, farm ponds, and wetlands do exist. However, based on pedestrian survey of the nearby pipeline route within this power line corridor, those pastures, ponds, and wetlands are likely dominated by smooth brome or reed canarygrass similar to those on or near the pipeline. All of the habitat within the PS-24 corridor is either cultivated or residential, with the exception of Deer Creek, which is a channelized, highly altered canal. In addition, the proposed power lines to PS-23B and PS-24 would occur outside of the NNHP-identified range of the western prairie fringed orchid. It is highly unlikely that western prairie fringed orchid is present in the power line corridors for either PS-23B or PS-24.

The potential power line route to PS-25 near Milford, Nebraska, is almost entirely composed of cultivated land. Sections of wooded habitat occur within the corridor along the West Fork Big Blue River. However, these are outside of the NNHP-identified range of the western prairie fringed orchid. Desktop surveys suggest that the areas traversed by this line would probably be unsuitable for this species. Furthermore, pedestrian surveys at creeks on the nearby proposed pipeline route found that herbaceous habitat in wetter areas was often dominated by smooth brome, reed canarygrass, and stinging nettle (*Urtica dioica*). Finally, the power line is expected to follow existing disturbed areas along the sides of public roads. It is highly unlikely that western prairie fringed orchid is present in the power line corridor to PS-25.

The proposed 0.1-mile power line route to PS-26 lies outside of the NNHP-identified range of the western prairie fringed orchid. In addition, this route traverses an area of dry, well-drained soils adjacent to an existing substation. It is highly unlikely that western prairie fringed orchid is present in the proposed power line corridor to PS-26.

3.3.4.3. Conservation Measures

Keystone, or electrical power providers where specified, will apply the following conservation measures as part of the proposed Project to avoid and minimize effects on the western prairie fringed orchid and potentially suitable habitat for the species.

- Pre-construction presence/probable absence surveys will be conducted within potentially suitable habitat that was not previously surveyed, including the power line route to PS-21. Survey results will be submitted to the USFWS for review. Species presence will be assumed in potentially suitable habitat if surveys cannot be conducted during the flowering period.
- The Project alignment will be adjusted to avoid any identified populations as practicable and/or approved by the landowner.
- To the greatest extent practicable, the width of the construction ROW will be reduced in areas where western prairie fringed orchid populations have been identified.
- Keystone will develop and implement a noxious and invasive weed control program consistent with the CMRP to reduce the potential for spread or invasion of weeds.
- Herbicide application will occur by spot spraying.
- Use of herbicides within 100 feet of documented western prairie fringed orchid occurrence will be restricted.
- Keystone will minimize the potential for altered hydrology (e.g., surface water flow, infiltration and groundwater levels) in potentially suitable habitat through BMPs outlined in the CMRP.
- Keystone will salvage and segregate topsoil appropriately where populations have been identified to preserve native seed sources in the soil for use in revegetation efforts in the ROW.
- Keystone will restore wet meadow habitat using a USFWS- and NGPC-approved seed mix.
- Potentially suitable wet meadow habitats will be restored following Project construction.
- Restoration of construction-related impacts on wet meadow habitats identified as potentially suitable for the western prairie fringed orchid will be monitored for a 5-year period, per USACE guidelines.
- Keystone has sited aboveground facilities to avoid potentially suitable western prairie fringed orchid wetland habitat.
- Keystone will prepare and implement a project-specific SPCC Plan.
- Keystone will mark and maintain a 100-foot buffer from river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers. These buffers will be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the HDD crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel and will use secondary containment and a spill kit will be onsite.
- Refueling and lubrication of construction equipment will occur in uplands and greater than 100 feet from streams and wetlands. Where this is not possible, designated personnel with special training in refueling, spill containment, and cleanup will conduct these activities.
- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands.

- All equipment will be parked at least 100 feet from a watercourse or wetland overnight, if possible.
- Equipment will not be washed in streams or wetlands.
- Construction and restoration activities will be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew will have sufficient tools and materials on hand to stop leaks, including supplies of absorbent and barrier materials that will allow for rapid containment and recovery of spilled materials.
- Water withdrawal for hydrostatic testing will be less than 10 percent of the baseline daily flow.
- Keystone will minimize temporary water reductions by withdrawing only the volume of water needed for hydrostatic testing as outlined in its permits. Water will be returned to its source within a 30-day period except where hydrostatic test water is used to test multiple spreads. At the conclusion of hydrostatic testing, the remaining water will be returned to the source.
- Pre-construction presence/probable absence surveys will be conducted in potentially suitable habitat along the power line routes to PS-22 through PS-25, during the appropriate flowering period. The NPPD will delineate and designate areas where western prairie fringed orchid habitat is present as "avoidance areas" where placement of structures and construction traffic will not occur.

3.3.4.4. Effects of the Action

Pipeline Construction

Construction of the proposed pipeline and ancillary facilities is highly unlikely to disturb western prairie fringed orchid communities because the species is unlikely to occur in the proposed pipeline ROW or within the footprint of ancillary facilities. However, approximately 135 acres of potential western prairie fringed orchid habitat would experience effects due to ground disturbance during construction of the proposed pipeline.

Revegetation of disturbed areas can introduce or expand invasive species, especially leafy spurge, Kentucky bluegrass, and Canada thistle, some potentially aggressive competitors of the western prairie fringed orchid. To avoid and minimize this risk, Keystone has developed weed and vegetation monitoring plans to prevent the spread of invasive species as a consequence of the proposed pipeline construction and operation. These plans are discussed in CMRP (Appendix B) Sections 2.13 and 4.16, respectively, and would be updated prior to construction.

Temporary withdrawals of water (e.g., for hydrostatic pipeline testing) have some potential for effects on potentially suitable habitat for this species. However, implementation of conservation measures as outlined above, in Keystone's CMRP, and in Appendix Z of the 2014 Final SEIS would help minimize effects, and these effects, if any, will be insignificant and discountable. Specifically, only the volume of water needed will be withdrawn, withdrawals will be limited to less than 10 percent of daily base flow, and the water will be returned back to its source at the conclusion of hydrostatic testing.

Operations

Operation of the proposed pipeline is not expected to result in marked effects on the western prairie fringed orchid. Up to approximately 45 acres of western prairie fringed orchid habitat within permanent pipeline ROW could be subject to periodic short-term disturbance during operations and maintenance of the pipeline. Clearing of trees and shrubs in the ROW would be required for operational monitoring, but since this species inhabits open, native prairie, no tree or shrub clearing would occur within suitable habitat. If herbicides must be used for noxious weed control, application would be conducted by spot spraying. Populations of western prairie fringed orchid would be identified and no herbicides would be used at those locations.

According to the Pipeline Temperature Effects Study (Appendix E), the pipeline does have some effect on surrounding soil temperatures, primarily at pipeline depth, in the space surrounding the pipe. Effects of pipeline-elevated soil temperatures vary seasonally. Heat effects in soil near the surface, where most plant root systems are located, are less pronounced than near soil around the pipe. Surficial soil temperatures relevant to vegetation are affected mainly by climate (such as air temperature and plant water availability) with negligible effects attributed to the operating pipeline. This is because the largest increase in temperature, in the summer months, is found within 24 inches of the pipeline. In addition, a minimum of 4 feet of cover over the top of the pipeline would result in minimal effects on vegetation. Therefore, there would be no effects of heat dissipation from the pipeline on the western prairie fringed orchid.

Emergency repairs and other maintenance activities could potentially affect the western prairie fringed orchid, particularly when such activities involve excavation. Although the location and extent of such activities cannot be predicted with certainty, it is possible that some could occur within suitable habitat for this species. Considering that there are no known populations within the pipeline route and that any individuals discovered would either be avoided by route microalignments or by reducing the size of the work area, it is highly unlikely that this species would be affected by maintenance and repairs.

Potential Spills

The likelihood of a spill occurring within the known range of the western prairie fringed orchid is shown in Table 3.3-4. By using known species ranges as opposed to surveyed habitat, a conservative estimate of the likelihood of a spill affecting listed species is made. Desktop or pedestrian habitat surveys along the proposed pipeline and power line ROW found that suitable habitat for listed species was absent from the survey corridor within much of the species' known range. Therefore, the likelihood of spills occurring within suitable habitat for this species would be lower than that listed in Table 3.3-4.

Resource (Species Range)	Small Spills per Year	Medium Spills per Year	Large Spills per Year	Estimated Years Between Spills within Species Range
Western prairie fringed orchid	0.5	0.09	0.01	2.0

Table 3.3-4Likelihood of Spills Occurring within the Range of the Western Prairie
Fringed Orchid

A crude oil spill could result in physical oiling of plants or soils, increased traffic during cleanup activities, and toxicological effects. While these exposure routes have the potential to cause effects, effects on the western prairie fringed orchid are unlikely, due to the low probability of western prairie fringed orchid occurring near the pipeline.

Power Infrastructure

The construction and operation of new electric power infrastructure could affect the western prairie fringed orchid if power line ROWs were to disturb potential habitat for this species. However, as described above under subsection 3.3.4.2, it is highly unlikely that western prairie fringed orchid is present along any of the proposed power infrastructure, and it is unlikely that the infrastructure would affect appreciable areas of high-quality habitat. Conservation measures, as listed above, would be implemented by electrical service providers to avoid and minimize effects on this species. Primarily, this would include pre-construction surveys of potentially suitable habitat within the range of the species. Any individuals identified within the planned route would either be avoided by route microalignments, adjusting power pole structure locations, or by reducing the size of the work area. In addition, the vast majority of the proposed power infrastructure lies along existing public roads, thus facilitating avoidance of any identified individuals. Therefore, effects from power infrastructure, whether subject to federal decisions or not, are unlikely.

3.3.4.5. Cumulative Effects

The proposed Project is unlikely to affect individuals but it would affect potentially suitable habitat for the western prairie fringed orchid. The proposed Project includes restoration of native vegetation and soil conditions and prevention of spread and control of noxious weeds in disturbed areas. Unavoidable alteration and maintenance of vegetation structure to ensure pipeline safety and to allow for visual inspection would result in some conversion of tall shrub and forested habitats to herbaceous habitats.

Other future non-federal activities reasonably certain to occur within the action area that also may affect individuals and/or potentially suitable habitat include non-federal pipelines, power infrastructure, residential and commercial development, state and county road projects creating new disturbed land, the spread of invasive plants, and the conversion of native prairie or wet meadow habitat to agricultural land or rangeland. Potential cumulative effects in the Platte River basin are described in further detail in a programmatic Biological Opinion on the Platte River Recovery Implementation Program (USFWS 2006) and incorporated by reference, although the current action area is only a small portion of the area evaluated in that programmatic Biological Opinion.

Cumulative effects, if any, resulting from future non-federal projects, when considered with the effects of the proposed Project considered in this BA, are expected to be minor.

3.3.4.6. Determination

Effect on the Species

Given that recent surveys have demonstrated the probable absence of this species from the pipeline construction corridor, that desktop studies have indicated that it is unlikely that individuals or high-quality habitat would occur in power line corridors, that pre-construction surveys would be completed in all work areas, and that other avoidance and conservation measures listed above would be implemented, the proposed Project "<u>may affect, but is not likely to adversely affect</u>" the western prairie fringed orchid.

3.4. SUMMARY OF EFFECTS ON FEDERALLY LISTED SPECIES AND THEIR HABITATS

This section summarizes the effects on federally listed species, including a summary of effects on habitat, a summary of effects on individuals, and a summary of overall findings.

3.4.1. Summary of Effects on Habitat

The Proposed Federal Decisions and the proposed Project would not affect any designated critical habitat, but the proposed Project could affect potentially suitable habitats for several species.

The proposed pipeline would avoid effects on potentially suitable habitats at major rivers by utilizing the HDD method, but it would affect potentially suitable habitats in uplands, wetlands, and small streams. Table 3.4-1 summarizes the areas of potentially suitable habitats that would be affected by the proposed pipeline.

	Habitat Area (acres)					
State	Whooping Crane	American Burying Beetle	Northern Long-Eared Bat	Western Prairie Fringed Orchid		
Montana	NQ ^a	0.00	6.7	0.00		
South Dakota	NQ ^a	513.2	11.2	NQ ^b		
Nebraska	NQ ^a	744.1	52.1	NQ ^b		
Total	NQ ^a	1,257.3	70.0	134.55		

 Table 3.4-1
 Potentially Suitable Habitat Affected by Pipeline Construction

Species not listed would not experience habitat effects from pipeline construction.

NQ = not quantified

^a Row crop agriculture is potential whooping crane foraging habitat, which constitutes the majority of the approximately 355 miles of pipeline and 115 miles of power lines within the 95 Percent Whooping Crane Migration Corridor. No roosting habitat would be affected.

^b This analysis did not separate habitat by state.

Keystone has sited its ancillary facilities and temporary sites to avoid designated critical habitat, listed species, and their habitats; the exception is one pipe yard in Keya Paha County, Nebraska, that is known to harbor the American burying beetle and is considered in the analysis under Section 3.2.6.4. For example, the proposed construction camps are all either currently used for agriculture

as a hay field or row crop, or they have already been surveyed for biological resources. Agricultural land is poor-quality American burying beetle habitat and is not habitat for any other species discussed in this BA, except that land used for row crop agriculture can be potential foraging habitat for the whooping crane.

Power lines could affect habitat for listed species, but only a portion of each line's ROW would be affected. Table 3.4-2 summarizes the areas of habitats that would overlap the proposed power line ROWs.

			Habitat Area (acres)				
State	Pump Station No. ^a	ROW (acres)	Whooping Crane ^b	Rufa Red Knot	Northern Long- Eared Bat	Western Prairie Fringed Orchid	American Burying Beetle
	9	744.13	0.00	0.61	0.00	0.00	0.00
	10	473.19	0.00	0.00	1.91	0.00	0.00
Montana	11	1.9	0.00	0.00	0.00	0.00	0.00
Wiomana	12	44.37	0.00	0.00	0.67	0.00	0.00
	13	152.43	0.00	0.00	0.28	0.00	0.00
	14	41.63	0.00	0.00	0.00	0.00	0.00
	15	149.61	0.00	0.00	0.00	0.00	0.00
	16	253.72	36.83	0.82	3.01	0.00	0.00
	17	65.77	5.27	0.00	0.00	0.00	0.00
South Dakota	18	157.24	42.94	0.33	0.37	0.00	0.00
	19	124.12	7.54	0.00	2.08	0.00	0.00
	20	104.47	69.59	0.89	0.48	0.00	16.54
	21	124.45	31.11	0.00	1.73	0.40	124.45
Nebraska	22	30.85	5.49	0.00	2.14	0.00	6.06
	23	37.03	14.08	0.00	2.3	0.00	0.00
	23B	40.87	24.28	0.00	0.23	0.00	0.00
	24	12.4	11.77	0.00	0.00	0.00	0.00
	25	112.17	58.92	0.09	2.75	0.00	0.00
	26	1.3	0.00	0.00	0.00	0.00	0.00
	Total ^c	2,671.65	307.82	2.74	17.95	0.40	147.05

 Table 3.4-2
 Potentially Suitable Habitat Overlapping Proposed Power Line ROWs

Species not listed would not have habitat overlapping the proposed power line ROWs.

^a Pump station numbering begins with PS-09 because the first eight pump stations in the system are located in Canada.

^{b.} Potentially suitable habitat was quantified only within the 95 percent whooping crane migration corridor (Pearse et al. 2018).

^c Total may differ from sum of column due to rounding error.

New, expanded, or rebuilt electrical substations would also affect habitats for listed species. Some of these areas may be affected only in the short term, but a large portion of these areas would be no longer constitute potential habitat for the entire life of the proposed Project. Table 3.4-3 summarizes the areas of habitats that would be affected by the proposed electrical substations.

			Habitat Area (acres)		
State	Pump Station No. ^a	Footprint (acres)	Whooping Crane	American Burying Beetle	
	9	5.75	0.00	0.00	
	10	3.00	0.00	0.00	
Montono	11	2.90	0.00	0.00	
wontana	12	0.00	0.00	0.00	
	13	1.30	0.00	0.00	
	14	0.00	0.00	0.00	
	15	4.00	0.00	0.00	
	16	4.00	0.00	0.00	
	17	0.00	0.00	0.00	
South Dakota	18	0.00	0.00	0.00	
	19	1.00	0.00	0.00	
	20	0.00	0.00	0.00	
	21	6.00	6.00 ^b	6.00	
Nebraska	22	3.50	0.00	3.50	
	23	0.00	0.00	0.00	
	23B	0.00	0.00	0.00	
	24	0.00	0.00	0.00	
	25	0.00	0.00	0.00	
	26	0.00	0.00	0.00	
	Total	31.45	6.00 ^b	9.50	

Species not listed would not experience habitat effects from electrical substations.

^a Pump station numbering begins with PS-09 because the first eight pump stations in the system are located in Canada.

^b Row crop agriculture is potential whooping crane foraging habitat. No roosting habitat would be affected.

Keystone, WAPA, and the local power providers would incorporate a number of BMPs and mitigation measures to limit the extent of the effects of the construction and operation activities described above. See Appendix B for Keystone's Construction Mitigation and Reclamation Plan and Appendix Z of the 2014 Final SEIS for a compiled list of additional mitigation measures organized by resource topic.

3.4.2. Summary of Effects on Individuals

The likely effect of the proposed Project on individuals of listed species was quantified only for the whooping crane and for the American burying beetle. For all other listed species, the conservation measures incorporated into the proposed Project would be sufficient to render any potential effects on individuals highly unlikely.

For the whooping crane, the incremental risk of collision with the proposed power lines was estimated to equate to 0.149 fatal whooping crane collisions over the 50-year life of the proposed Project. This estimate would be for unmarked power lines. However, portions of the proposed power lines will be marked with BFDs, further reducing the chances for fatal power line strikes associated with the proposed Project.

For the American burying beetle, the proposed Project is estimated to affect approximately 555 individuals. Of those, approximately 66 would be affected by pipeline construction, approximately 485 would be affected by pipeline normal operation, approximately 0.5 would be affected by routine maintenance and repair, approximately 4 would be affected by spills, and approximately 1 would be affected by the construction of power lines and substations. However, the conservation measures described in Section 3.2.6.3 would likely reduce the number of individuals affected.

3.4.3. Summary of Analysis Findings

Table 3.4-4 below provides a summary of the species included in the analysis and the effect determinations for each, as described above.

Common Name	Scientific Name	Federal Status	Findings Summary
Black-footed ferret	Mustela nigripes	Endangered Populations/ Experimental Populations	NLAA NLAA
Northern long-eared bat	Myotis septentrionalis	Threatened	MA
Interior least tern	Sternula antillarum	Endangered	NLAA
Piping plover	Charadrius melodus	Threatened	NLAA
Rufa red knot	Calidris canutus rufa	Threatened	NLAA
Whooping crane	Grus americana	Endangered	NLAA
Pallid sturgeon	Scaphirhynchus albus	Endangered	NLAA
Topeka shiner	Notropis topeka	Endangered	NLAA
American burying beetle	Nicrophorus americanus	Endangered	MALAA
Western prairie fringed orchid	Platanthera praeclara	Threatened	NLAA

 Table 3.4-4
 Determination Summary

MA = may affect, but complies with 4(d) rule; MALAA = may affect, likely to adversely affect; NLAA = may affect, not likely to adversely affect

4. REFERENCES

AECOM. 2008a. Personal communication between C. Bessken (USFWS) and P. Lorenz (AECOM). June 11, 2008.

____. 2008b. Personal communication between D. Backlund (SDGFP) and P. Lorenz (AECOM). July 9, 2008.

_____. 2008c. TransCanada Keystone XL Project - USFWS/MFWP Meeting Notes. Helena, Montana. May 8, 2008.

_____. 2008d. TransCanada Keystone XL Project - USFWS/SDGFP Meeting Notes. Lincoln, Nebraska. May 5, 2008.

_____. 2008e. TransCanada Keystone XL Project - USFWS/SDGFP Meeting Notes. Pierre, South Dakota. June 10, 2008.

_____. 2009a. Personal communication between L. Hanebury (USFWS) and P. Lorenz (AECOM). April 16, 2009.

____. 2009b. TransCanada – Keystone XL Phase II Pipeline Meeting Summary. J. Cochnar (USFWS), C. Grell (NGPC), R. Schneider (NGPC), M. Fritz (NGPC), and P. Lorenz (AECOM). February 19, 2009.

____. 2009c. TransCanada – Keystone XL Phase II Pipeline Meeting Summary: Attachment. Summary Report of the Findings for Sensitive Species and Their Associated Habitat During the 2008 Biological Field Surveys Along the Keystone Pipeline Project of the Keystone XL Pipeline Project in Montana. February 5, 2009.

____. 2009d. TransCanada Keystone XL Project - USFWS/MFWP Meeting Summary. Glasgow, Montana. February 3, 2009.

- Armbruster, M. J. 1990. Characterization of Habitat Used by Whooping Cranes during Migration. *Biological Report* 90, no. 4:1-16.
- Atkinson, S.J., and A.R. Dood. 2006. *Montana Piping Plover Management Plan*. Montana Department of Fish, Wildlife, and Parks. Bozeman, Montana.
- Auer, S. 2018. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/ view/checklist/S46610787.
- Austin, J.E., and A.L. Richert. 2001. A Comprehensive Review of the Observational and Site Evaluation Data of Migrant Whooping Cranes in the United States, 1943-99. U.S. Geological Survey, Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. Accessed September 15, 2019. Retrieved from: https://pubs.usgs.gov/unnumbered/93805/report.pdf.
- Avian Power Line Interaction Committee (APLIC). 1994. *Mitigating Bird Collision with Power Lines: The State of the Art in 1994.* Edison Electrical Institute. Washington, D.C.

- ____. 1996. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996. Edison Electric Institute and the Raptor Research Foundation. Washington, D.C.
- ____. 2006. *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

____. 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012.* Edison Electric Institute and APLIC. Washington, D.C.

- Backlund, D.C., and G.M. Marrone. 1997. "New Records of the Endangered American Burying Beetle, *Nicrophorus americanus* Olivier, (Coleoptera: Silphidae) in South Dakota." *The Coleopterists Bulletin* 51: 53-58.
- Backlund, D.C., G.M. Marrone, C.K. Williams, and K. Tilmon. 2008. "Population Estimate of the Endangered American Burying Beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) in South Dakota." *The Coleopterists Bulletin* 62: 9-15.
- Bacon L. 2013. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/ view/checklist/S31911151.
- Bainbridge, B. 2017. *R-Project Draft Habitat Conservation Plan*. Nebraska Public Power District. Accessed January, 2 2019. Retrieved from: https://www.regulations.gov/ document?D=FWS-R6-ES-2014-0048-0059.
- Barbour, R.W., and W.H. Davis. 1969. *Bats of America*. Lexington, KY: The University Press of Kentucky.
- Barrientos, R., J.C. Alonso, C. Ponce, and C. Palacín. 2011. "Meta-analysis of the Effectiveness of Marked Wire in Reducing Avian Collisions with Power Lines." *Conservation Biology* 25: 893-903. doi:10.1111/j.1523-1739.2011.01699.
- Bedick J.C., B.C. Ratcliffe, W.W. Hoback, and L.G. Higley. 1999. "Distribution, Ecology, and Population Dynamics of the American Burying Beetle [*Nicrophorus americanus* Oliver (*Coleoptera, Silphidae*)] in South-central Nebraska, USA." Journal of Insect Conservation 3: 171-181.
- Bedick, J.C., W.W. Hoback, and M.C. Albrecht. 2006. "High Water-loss Rates and Rapid Dehydration in the Burying Beetle, *Nicrophorus marginatus*." *Physiological Entomology* 31: 23-29.
- Bent, A.C. 1929. "Life Histories of North American Shorebirds (Part II)." U.S. National Museum Bulletin 146.
- Berglund, Jeff. 2014. Email Communication from Jeff Berglund, USFWS Fish and Wildlife Biologist, Montana, to Jeff Harms, USFWS Fish and Wildlife Biologist, Nebraska June 11, 2014.
 - _____. 2018. Personal Communication from Jeff Berglund, USFWS Fish and Wildlife Biologist, Federal Activities, Section 7, to John Beaver, WESTECH Sr. Biologist. December 19, 2018.

- Bernardino, J., K. Bevanger, R. Barrientos, J.F. Dwyer, A.T. Marques, R.C. Martins, J.M. Shaw, J.P. Silva, and F. Moreira. 2018. "Bird Collisions with Power Lines: State of the Art and Priority Areas for Research." *Biological Conservation* 222: 1-13. doi: https://doi.org/10.1016/j.biocon.2018.02.029
- Bishop, A.A., W.W. Hoback, M. Albrecht, and K.M. Skinner. 2002. "GIS Reveals Niche Partitioning by Soil Texture among Carrion Beetles." *Transactions in GIS* 6: 457-470.
- Brees, A. 2001. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S41980917.
- Broders, H.G., G.J. Forbes, S. Woodley, and I.D. Thompson. 2006. "Range Extent and Stand Selection for Roosting and Foraging in Forest-Dwelling Northern Long-eared Bats and Little Brown Bats in the Greater Fundy Ecosystem, New Brunswick." *Journal of Wildlife Management* 70: 1174-1184.
- Brown, W.M., R.C. Drewien, and E.G. Bizeau. 1987. "Mortality of Cranes and Waterfowl from Power Line Collisions in the San Luis Valley, Colorado." In *Proceedings of the 1985 Crane Workshop*, edited by J. C. Lewis, 128–136. Platte River Whooping Crane Habitat Maintenance Trust.
- Brown, W.M. and R.C. Drewien. 1995. "Evaluation of Two Power Line Markers to Reduce Crane and Waterfowl Collision Mortality". *Wildlife Society Bulletin* 23: 217-227.
- Bureau of Reclamation. 2008. *Intake Diversion Dam Fish Screens—Evaluation of Fish Screens for Protecting Early Life Stages of Pallid Sturgeon*. Bureau of Reclamation Water Resources Research Laboratory. Draft Hydraulic Laboratory Report HL-2007-010.
- Butler, M.J. and W. Harrell. 2019. Whooping Crane Survey Results: Winter 2018-2019. Available: https://friendsofthewildwhoopers.org/whooping-crane-survey-result-winter-2018-2019/. Accessed September 16, 2019.
- Butler, M.J., G. Harris, and B.N. Strobel. 2013. "Influence of whooping crane population dynamics on its recovery and management." *Biological Conservation* 162: 89-99.
- Campbell, L. 2003. Endangered and Threatened Animals of Texas: Their Life History and Management. Accessed December 10, 2012. Retrieved from: http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index. phtml.
- Canadian Wildlife Service and U.S. Fish and Wildlife Service (CWS and USFWS). 2005. *Draft International Recovery Plan for the Whooping Crane*. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW) and USFWS.
 - _____. 2007. *International Recovery Plan for the Whooping Crane*. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW) and USFWS.
- Carter, T.C., and G.A. Feldhamer. 2005. "Roost Tree Use by Maternity Colonies of Indiana Bats and Northern Long-eared Bats in Southern Illinois." *Forest Ecology and Management* 219: 259-268.

Cassidy, A.L.E.V, A.E. Burger, and M.J.F. Lemon. 1998. *Testing the Efficacy of Spiral Vibration Dampers to Reduce Bird Collisions with Overhead Transmission Wires at the Roberts Bank Superport in 1997.* Vancouver Port Corporation and British Columbia Hydro. Accessed December 21, 2018. Retrieved from: http://www.robertsbankterminal2.com/wp-content/uploads/Testing-the-Efficacy-of-Spiral-Vibration-Dampers-to-Reduce-Bird-Collisions-with-Overhead-Transmission-Wires-at-the-Roberts-Bank-Superport-1997.pdf

- Catlin, D.H. 2009. "Population Dynamics of Piping Plovers (*Charadrius melodus*) on the Missouri River." PhD diss., Virginia Polytechnic Institute and State University.
- Central Flyway Council. 2013. Letter to the U.S. Fish and Wildlife Service Division of Policy and Directives Management. November 26, 2013.
- Cohen, J. B., S. M. Karpanty, J. D. Fraser, B. D. Watts, and B. R. Truitt. 2009. "Residence Probability and Population Size of Red Knots During Spring Stopover in the Mid-Atlantic Region of the United States." *Journal of Wildlife Management* 73, no. 6: 939– 945.
- Cohen, J. B., S. M. Karpanty, J. D. Fraser and B. R. Truitt. 2010. "The Effect of Benthic Prey Abundance and Size on Red Knot (*Calidriscanutus*) Distribution at an Alternative Migratory Stopover Site on the U.S. Atlantic Coast." *Journal of Ornithology* 151: 355-364.
- Cowie, R.H., and D.G. Robinson. 2003. "Pathways of Introduction of Non-indigenous Land and Freshwater Snails and Slugs." In *Invasive Species: Vectors and Management Strategies*, edited by G. M. Ruiz and J. T. Carlton, 93-122. Washington, DC: Island Press.
- Creighton, J. C., C. C. Vaughn, and B. R. Chapman. 1993. "Habitat Preference of the Endangered American Burying Beetle (*Nicrophorus americanus*) in Oklahoma." *The Southwestern Naturalist* 38, no. 3: 275-306.
- Davis, M. 2015. "Three larval-stage pallid sturgeon prove species is spawning in the wild." *Omaha World-Herald*. April 18, 2015. Accessed September 19, 2019. Retrieved from: https://www.omaha.com/outdoors/three-larval-stage-pallid-sturgeon-prove-species-isspawning-in/article_26c073af-0f4f-5ab9-b85f-3aba1578acb8.html.
- DeLonay, A.J., R.B. Jacobson, K.A. Chojnacki, M.L. Annis, P.J. Braaten, C.M. Elliott, D.B. Fuller, J.D. Haas, T.M. Haddix, H.L.A. Ladd, B.J. McElroy, G.E. Mestl, D.M. Papoulias, J.C. Rhoten, and M.L. Wildhaber. 2014. *Ecological Requirements for Pallid Sturgeon Reproduction and Recruitment in the Missouri River—Annual Report 2011*: U.S. Geological Survey Open-File Report 2014–1106, 96 p. Accessed November 13, 2019. Retrieved from: http://dx.doi.org/10.3133/ofr20141106.
- Dinan, L.R., J.G. Jorgensen, and M.B. Brown. 2012. "Interior Least Tern Powerline Collision on the Lower Platte River." *Papers in Natural Resources* 639.
- Dwyer, J.F., A.K. Pandey, L.A. McHale, R.E. Harness. 2019. Near-ultraviolet light reduced sandhill crane collisions with a power line by 98%. The Condor: Ornithological Applications 121(2): 1-10.
- eBird. 2018. eBird: An Online Database of Bird Distribution and Abundance. Cornell Lab of Ornithology, Ithaca, New York. Accessed November 13, 2018. Retrieved from: https://ebird.org/home.
- eBird. 2019. eBird: An Online Database of Bird Distribution and Abundance. Cornell Lab of Ornithology, Ithaca, New York. Accessed September 15, 2019. Retrieved from: https://ebird.org/home.
- EcoCentrics and WESTECH. 2018. Union Creek Topeka Shiner Survey Report. Project Number: TAL-00050388-60.
- ENSR Corporation. 2008. Habitat Assessment for the Federally Endangered American Burying Beetle (Nicrophorus americanus) along the Keystone Pipeline Project of the Keystone XL Project Right-of-Way in Nebraska and South Dakota. Document No.: 10623-007.
- Eggert, A., and S.K. Sakaluk. 2000. "Benefits of Communal Breeding in Burying Beetles: A Field Experiment." *Ecological Entomology* 25: 262-266.
- Elliott-Smith, E., and S. M. Haig. 2004. "Piping Plover (*Charadrius melodus*), version 2.0," in *The Birds of North America*, ed. A. F. Poole. Ithaca, NY: Cornell Lab of Ornithology. https://doi.org/10.2173/bna.2
- Exp Energy Services Inc. 2012. TransCanada Keystone XL Pipeline Project: Environmental Report. September 7, 2012.
 - ____. 2018. Keystone XL MAR Environmental Report. April 19, 2018.
- Exp and Hoback Consulting Inc. 2018. *American Burying Beetle Survey Report: Nebraska Mainline Alternative Route*. Project Number: TAL-00050388-60.
- Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. *Mammals of Colorado*. Denver, CO: University Press of Colorado.
- Fitzsimmons, O. 2011. "Red Knots and Red Tides." *The Brown Pelican: The Newsletter of the Coastal Bend Audubon Society* 2011: 3.
- Fjetland, C. A. 1987. "Comments on Whooping Crane Recovery Activities." In *Proceedings of the 1985 North American Crane Workshop*, edited by C. Lewis. Platte River Whooping Crane Maintenance Trust and U.S. Fish and Wildlife Service.
- Fortenbery, D.K. 1972. "Characteristics of the Black-Footed Ferret." U.S. Department of the Interior, U.S. Fish and Wildlife Service, Bureau of Sport Fisheries and Resource Publication 109.
- Foster, R.W., and A. Kurta. 1999. "Roosting Ecology of the Northern Bat (*Myotis septentonalis*) and Comparisons with the Endangered Indiana Bat (*Myotis sodalis*). Journal of *Mammalogy* 80: 659- 672.

- French, B. 2015. "Biologists document rare sturgeon's spawning run." Billings Gazette. February 12, 2015. Accessed on September 19, 2019. Retrieved from: https://billingsgazette.com/lifestyles/recreation/biologists-document-rare-sturgeon-sspawning-run/article_468383c2-d128-5154-95e1-f00533b39569.html
- Fuller, P.L. 2003. "Freshwater Aquatic Vertebrate Introductions in the United States: Patterns and Pathways." In *Invasive Species: Vectors and Management Strategies*, edited by G.M. Ruiz and J.T. Carlton, 123-151. Washington, DC: Island Press.
- Fuller, D.B., and T.M. Haddix. 2012. Examination of Pallid Sturgeon Use, Migrations and Spawning in Milk River and Missouri River below Fort Peck Dam during 2011. U.S. Geological Survey, Columbia Environmental Research Center. Montana Fish, Wildlife and Parks, Fort Peck, MT.
- Gil de Weir, K. 2006. "Whooping Crane (*Grus americana*) Demography and Environmental Factors in a Population Growth Simulation Model." Ph.D. dissertation, Texas A & M University. May.
- Gratto-Trevor, C.L., V.H. Johnston, and S.T. Pepper. 2001. "Evidence for Declines in Arctic Populations of Shorebirds." *Bird Trends* 8: 27-29.
- Haig, S.M. 1986. *Piping Plover Species Distribution*. Endangered Species Information System Workbook I. U.S. Fish and Wildlife Service.
- Haig, S.M., and J.H. Plissner. 1993. "Distribution and Abundance of Piping Plover: Results and Implications of the 1991 Census." *Condor* 95: 145-156.
- Harrington, B. 2001. "Red Knot (*Calidris canutus*)." In *The Birds of North America*. Ithaca: Cornell Lab of Ornithology.
- Henderson, F.R., P.F. Springer, and R. Adrian. 1969. "The Black-Footed Ferret in South Dakota." South Dakota Department of Game, Fish, and Parks. *Technical Bulletin* 4: 137.
- Henderson, I.G., R.H.W Langston, and N.A. Clark. 1996. "The Response of Common Terns Sterna hirundo to Power Lines: An Assessment of Risk in Relation to Breeding Commitment, Age and Wind Speed." Biological Conservation 77: 185–192.
- Henderson, L.E., and H.G. Broders. 2008. "Movements and Resource Selection of the Northern Long-eared Myotis (*Myotis septentrionalis*) in a Forest-agriculture Landscape." Journal of Mammalogy 89: 952- 963.
- Hillman, C.N. 1968. "Life History and Ecology of the Black-Footed Ferret." MS thesis, South Dakota State University.
- Hillman, C.N., and J.W. Carpenter. 1980. "Breeding Biology and Behavior of Captive Black-Footed Ferrets." *International Zoo Yearbook* 23: 186191.
- Hinton, H.E. 1981. Biology of Insect Eggs. Oxford: Pergammon.

Hoback, W. 2010. American Burying Beetle Habitat Assessment Model and Field Survey Results for Nebraska and Texas along the Keystone XL Pipeline Project and Habitat Assessment for South Dakota. August 2010.

____. 2012. Hoback August Survey Report. Results of Survey for American Burying Beetle, Nicrophorus americanus, in Northern Keya Paha, Western Boyd, Eastern Holt, and Antelope Counties.

____. 2016. *Effects of Compaction and Soil Moisture on American Burying Beetles*. Nebraska Department of Roads and the Federal Highway Administration. Report No. SPR-P1(15) M049.

_____. 2019. Email Communication from Dr. Wyatt Hoback of Hoback Consulting to Valerie Haragan and Jon Schmidt of EXP Energy Services. November 22, 2019.

- Hoback, W. and A. Conley. 2014. Overwintering Biology and Tests of Trap and Relocate as a Conservation Measure for Burying Beetles. Nebraska Department of Roads. Research Project Number M330. Accessed September 19, 2019. Retrieved from: https://dot.nebraska.gov/media/5721/final-report-m330.pdf
- Hogberg, L.K., K.J. Patriquin, and R.M.R. Barclay. 2002. "Use by Bats of Patches of Residual Trees in Logged Areas of Boreal Forest." *American Midland Naturalist* 148: 282-288.
- Homer, C.G., J.A. Dewitz, L. Yang, S. Jin, P. Danielson, G. Xian, J. Coulston, N.D. Herold, J.D. Wickham, and K. Megown. 2015. "Completion of the 2011 National Land Cover Database for the Conterminous United States-Representing a Decade of Land Cover Change Information." *Photogrammetric Engineering and Remote Sensing* 81, no. 5: 345-354.
- Howe, M.A. 1987. "Habitat Use by Migrating Whooping Cranes in the Aransas-Wood Buffalo Corridor." In *Proceedings of the 1985 Crane Workshop*, edited by J.C. Lewis, 303-311. Grand Island, Nebraska: Platte River Whooping Crane Habitat Maintenance Trust.
- International Crane Foundation (ICF). 2018. Whooping Crane *Grus Americana*. Accessed January 1, 2019. Retrieved from: https://www.savingcranes.org/species-field-guide/whooping-crane/.
- International Union for Conservation of Nature (IUCN). 2014. Topeka Shiner: *Notropis topeka*. Accessed June 22, 2018. Retrieved from: http://www.iucnredlist.org/details/184092/0.
- Jenkins A., J. Smallie, and M. Diamond. 2010. "Avian Collisions with Power Lines: A Global Review of Causes and Mitigation with a South African Perspective." *Bird Conservation International* 20: 263-278.
- Jenkins, T., W.W. Hoback, D. Leasure, P. Mulder, and C. Davis. 2018. "Distribution of the Endangered American Burying Beetle at the Northwestern Limit of its Range." *Insect Systematics and Diversity* 2, no. 1: 1–8. doi: 10.1093/isd/ixx011
- Johns, B.W., E.J. Woodsworth, and E.A. Driver. 1997. "Habitat Use by Migrant Whooping Cranes in Saskatchewan." *Proceedings North American Crane Workshop* 7: 123-131.

Jorgensen, J. 2014. "Red Knot (*Calidris canutus*)—Its Distribution and Temporal Occurrence in Nebraska." Information based on species account from Sharpe et al. 2001, revised by W. Ross Silcock, 14 September 2014.

_____. 2017. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S37698660.

- Jung, T.S., I.D. Thompson, R.D. Titman, and A. Applejohn. 1999. "Habitat Selection by Forest Bats in Relation to Mixed-wood Stands Types and Structure in Central Ontario." *Journal of Wildlife Management* 63: 1306-1319.
- Jurzenski, J. 2012. "Factors Affecting the Distribution and Survival of Endangered American Burying Beetles, *Nicrophorus americanus* Olivier." Ph.D. dissertation, University of Nebraska-Lincoln, Nebraska.
- Jurzenski, J., D.G. Snethen, M.L. Brust, and W.W. Hoback. 2011. "New Records of Carrion Beetles in Nebraska Reveal Increased Presence of the American Burying Beetle, *Nicrophorus americanus* Oliver (Coleoptera: Silphicae)." *Great Plains Research* 21: 131-143.
- Kuyt, E. 1992. "Aerial Radio-tracking of Whooping Cranes Migrating between Wood Buffalo National Park and Aransas National Wildlife Refuge, 1981-1984." Occasional Paper Number 74. Canadian Wildlife Service. Ottawa, Canada.
- Keystone, see TransCanada Keystone Pipeline, L.P.
- Lacki, M.J., and J. Schwierjohann. 2001. "Day Roost Characteristics of Northern Bats in Mixed Mesophytic Forest." *Journal of Wildlife Management* 65: 482-488.
- Lacki, M.J., D.R. Cox, and M.B. Dickinson. 2009. "Meta-analysis of Summer Roosting Characteristics of Two Species of Myotis Bats." *American Midland Naturalist* 162: 318– 326.
- Leasure, D.R. and W.W. Hoback. 2017. "Distribution and Habitat of Endangered American Burying Beetle in Northern and Southern Regions." *Journal of Insect Conservation* 21:75–86. doi: 10.1007/s10841-017-9955-5.
- Lewis, J. C., E. Kuyt, K. E. Schwindt, and T. V. Stehn. 1992. "Mortality in Fledged Whooping Cranes of the Aransas/Wood Buffalo Population." In *Proceedings of the 1988 North American Crane Workshop*, edited by D. Wood, 145–148. Lake Wales, Florida: State of Florida Game and Fresh Water Fish Commission.
- Lewis, T. E. and R. D. Slack. 2008. "Whooping cranes and human disturbance: An historical perspective and literature review." Proceedings of the North American Crane Workshop 10:3-6.
- Linder, R.L., R.B. Dahlgren, and C.N. Hillman. 1972. Black-Footed Ferret Prairie Dog Interrelationships. Symposium on Rare and Endangered Wildlife of the Southwestern United States. Albuquerque, New Mexico. New Mexico Department of Game and Fish, Santa Fe, New Mexico.

- Lingle, G.R. 1987. "Status of Whooping Crane Migration Habitat within the Great Plains of North America." In *Proceedings of the 1985 Crane Workshop*, edited by J.C. Lewis and J. Zewitz, 331-340. Grand Island, Nebraska: Platte River Whooping Crane Habitat Maintenance Trust and USFWS.
- Lingle, G.R., G.A. Wingfield, and J.W. Ziewitz. 1991. "The Migration Ecology of Whooping Cranes in Nebraska, U.S.A." In *Proceeedings of the 1987 International Crane Workshop*, *International Crane Foundation*, edited by J. Harris, 395-401. Baraboo, WI.
- Lott, C.A., R.L. Wiley, R.A. Fishcher, P.D. Hartfield, and J.M. Scott. 2013. "Interior Least Tern (*Sternula antillarum*) Breeding Distribution and Ecology: Implications for Populationlevel Studies and the Evaluation of Alternative Management Strategies on Large, Regulated Rivers." *Ecology and Evolution* 3, no. 10: 3613–3627. doi: 10.1002/ece3.726.
- Maxell, B. Email from B. Maxell, MNHP Program Coordinator, to J. Beaver, WESTECH. July 17, 2018.
- McEneaney, T. 1974. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S30567177.
- Menzel, M.A., S.F. Owen, W.M. Ford, J.W. Edwards, P.B. Wood, B.R. Chapman, and K.V.
 Miller. 2002. "Roost Tree Selection by Northern Long-eared Bat (*Myotis septentrionalis*) Maternity Colonies in an Industrial Forest of the Central Appalachian Mountains." Forest Ecology and Management 155: 107-114.
- Miller, K. 2018. eBird Checklists. Accessed November 13, 2018. Retrieved from: https://ebird.org/map/leater1?neg=true&env.minX=-102.08553505864393& env.minY=44.48157712412611&env.maxX=-101.93704796757947&env.max Y=44.53232143621551&zh=true&gp=false&ev=Z&mr=1-12&bmo=1&emo= 12&yr=all&byr=1900&eyr=2018.
- Miller, W. 2013. An Approach for Determination of Instream Flow Needs for Pallid Sturgeon and Other Key Fish Species in the Lower Yellowstone River. Accessed November 22, 2019. Retrieved from: http://www.pallidsturgeon.org/wp-content/uploads/2014/06/Final-Pallid-Sturgeon-IFN-Report-12-05-13.pdf
- Milne, L.J., and M.J. Milne. 1976. "The Social Behavior of Burying Beetles." *Scientific American* 235:84-89.
- Minnesota Department of Natural Resources. 2007. Western Prairie Fringed Orchid: A Threatened Midwestern Prairie Plant.
- Montana Department of Fish, Wildlife, and Parks (MFWP). 2019. *Locations of Twelve Telemetered Pallid Sturgeon Upstream of Intake Dam, September 2019.* Submitted as part of a formal comment by the Governor of Montana RE: Keystone XL Pipeline Draft SEIS, docket number DOS-2019-0033. November 18, 2019.

Montana Natural Heritage Program (MNHP). 2018. Natural Heritage Map Viewer Red Knot and Northern Long-Eared Bat Generalized Observations. Accessed November 2, 2018. Retrieved from: http://mtnhp.org/mapviewer/

___. 2019. Element Occurrence GIS Shapefile. Received, January 2, 2019.

- Morkill, A.E. 1990. "Effectiveness of Markers in Reducing Sandhill Crane Collisions with Power Lines," thesis, University of Wyoming, Laramie.
- Morkill, A.E., and S.H. Anderson. 1991. "Effectiveness of Marking Powerlines to Reduce Sandhill Crane Collisions." *Wildlife Society Bulletin* 19, no. 4: 442-449.
- Murphy, R.K., J.F. Dwyer, E.K. Mojica, M.M. McPherron, and R.E. Harness. 2016. "Reactions of Sandhill Cranes Approaching a Marked Transmission Power Line." *Journal of Fish and Wildlife Management* 7, no. 2: 480-489.
- Murphy, R.K., S.M. McPherron, G.D. Wright, and K.L. Serbousek. 2009. Effectiveness of Avian Collision Averters in Preventing Migratory Bird Mortality from Power Line Strikes in the Central Platte River, Nebraska 2008-2009 Final Report. Department of Biology, University of Nebraska-Kearney, Kearney, NE.
- Nature Saskatchewan. 2014. *Calidris canutus*, Red Knot. Accessed November 13, 2018. Retrieved from: http://www.naturesask.ca/rsu_docs/red-knot.pdf.
- NatureServe. 2009. *NatureServe Explorer: An Online Encyclopedia of Life*. Version 7.1. Arlington, VA: NatureServe.
- Nebraska Game and Parks Commission (NGPC). 2011. Estimated Current Range of Topeka Shiner (*Notropis topeka*). Accessed June 22, 2018. Retrieved from: https://outdoornebraska.gov/wp-content/uploads/2015/07/Topeka-Shiner.pdf

____. 2012. Topeka Shiner (*Notropis topeka*). Accessed June 22, 2018. Retrieved from: https://outdoornebraska.gov/wp-content/uploads/2015/09/NLP_Assessment_TopekaShiner.pdf.

Nebraska Natural Heritage Program (NNHP). 2018. Conservation and Environmental Review Tool (CERT) Project Report and GIS files. Received July 20, 2018.

_____. 2019. Conservation and Environmental Review Tool (CERT) Project Report and GIS files. Received January 11, 2019.

- Newstead, D.J., L.J. Niles, R.R. Porter, A.D. Dey, J. Burger, and O.N. Fitzsimmons. 2013. "Geolocation Reveals Mid-continent Migratory Routes and Texas Wintering Areas of Red Knots *Calidris canutus rufa*." *Water Study Group Bulletin* 120, no. 1: 53-59.
- Nelson, D.L. 1998. "Least Tern." In *Colorado Breeding Bird Atlas*, edited by H.E. Kingery, 192-193. Colorado Bird Atlas Partnership and Colorado Division of Wildlife.

- Niles, L.J., H.P. Sitters, A.D. Dey, P.W. Atkinson, A.J. Baker, K.A. Bennett, R. Carmona, K.E. Clark, N.A. Clark, C. Espoz, P.M. Gonzalez, B.A. Harrington, D.E. Hernandez, K.S. Kalasz, R.G. Lathrop, R.N. Matus, C.D.T. Minton, R.I.G. Morrison, M.K. Peck, W. Pitts, R.A. Robinson and I.L. Serrano. 2008. "Status of the Red Knot (*Calidris canutusrufa*) in the Western Hemisphere." *Studies in Avian Biology* 36: 1-185.
- Owen, S., M.A. Menzel, M.W. Ford, B.R. Chapman, K.V. Miller, J. Edwards, and P. Wood. 2003. "Homerange Size and Habitat Use by Northern Myotis (*Myotis septentrionalis*)." *American Midland Naturalist* 150: 352-359.
- Owen, S.F., M.A. Menzel, W.M. Ford, J.W. Edwards, B.R. Chapman, K.V. Miller, P.B. Wood. 2002. *Roost Tree Selection by Maternal Colonies of Northern Long-eared Myotis in an Intensively Managed Forest*. General Technical Report NE-292. Newtown Square, PA: U. S. Department of Agriculture, Forest Service, Northeastern Forest Experiment Station. doi: https://doi.org/10.2737/NE-GTR-292
- Park, A.C. 2010. "Factors Affecting the Distribution and Roost-site Selection of Bats on the Island of Newfoundland," MS thesis, Saint Mary's University, Canada.
- Parker, R. 2014. "Enbridge Oil Cleanup on the Kalamazoo River Finished, All Sections of the River Open for Public Use." *Michigan Live*, October 9, 2014. Accessed May 23, 2018. Retrieved from: http://www.mlive.com/news/kalamazoo/index.ssf/2014/10/enbridge_oil_ cleanup_on_the_ka.html.
- Patriquin, K.J., and R.M.R. Barclay. 2003. "Foraging by Bats in Cleared, Thinned and Unharvested Boreal Forest." *Journal of Applied Ecology* 40: 646-657.
- Pearse, A.T., M. Rabbe, L.M. Juliusson, M.T. Bidwell, L. Craig-Moore, D.A. Brandt, and W. Harrell. 2018. "Delineating and Identifying Long-term Changes in the Whooping Crane (*Grus americana*) Migration Corridor." *PLoS ONE* 13, no. 2: 1-15.
- Pearse, A.T., D.A. Brandt, B.K. Hartup, and M.T. Bidwell. 2019. Mortality in Aransas-Wood Buffalo whooping cranes: Timing, location, and causes. *In* Nyhus, P.J., J.B. French, Jr., S. J. Converse, and J. E. Austin, eds. *Whooping Cranes: Biology and Conservation*. San Diego, CA, USA: Academic Press.
- Phillips, L. 2003. "Pollination of Western Prairie Fringed Orchid, *Platanthera praeclara*: Implications for Restoration and Management." *Restoration and Reclamation Review* 8, no. 1. Accessed December 10, 2012. Retrieved from: http://purl.umn.edu/60217.
- Philpott, T. 2013. "King corn mowed down 2 million Acres of grassland in 5 years flat." *Mother Jones*. Accessed September 15, 2019. Retrieved from http://www.motherjones.com/tom-philpott/2013/02/king-corn-gobbles-climate-stabilizing-grassland-midwest.
- Piersma, T. and J. A. van Gils. 2011. *The Flexible Phenotype, a Body Centered Integration of Ecology, Physiology and Behaviour*. Oxford: Oxford University Press.
- Prellwitz, D. 1986. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S17203238.

_____. 2005. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S9115587.

- Pukowski, E. 1933. "Ökoloische Untersuchungen an Necrophorus F." Zeitschrift für Morphologie und Ökologie der Tiere 27: 518-586.
- Ratcliffe, B. 1996. "The Carrion Beetles (*Coleoptera: Silphidae*) of Nebraska." *Bulletin of the University of Nebraska State Museum* 13: 1-100.
- Rauscher, R.L, S. Story, J. Gude, and R. Russell. 2013. "Estimation of Black-tailed Prairie Dog Colonies in Montana." *Wildlife Society Bulletin* 9999: 1-8.
- Sasse, D.B., and P.J. Pekins. 1996. "Summer Roosting Ecology of Northern Long-eared Bats (*Myotis septentrionalis*) in the White Mountain National Forest." Bats and Forests Symposium. British Columbia Ministry of Forests Working Paper.
- Schnell, G.D., A.E. Hiott, J.C. Creighton, V.L. Smyth, and A. Komendat. 2008. "Factors Affecting Overwinter Survival of the American Burying Beetle, *Nicrophorus americanus* (*Coleoptera: Silphidae*)." Journal of Insect Conservation 12: 483-492.
- Schwalbach, M.J. 1988. Conservation of least tern and piping plovers along the Missouri River and its major western tributaries in South Dakota (Master's Thesis). South Dakota State University.
- Scott, M.P. 1998. "The Ecology and Behavior of Burying Beetles." *Annual Review of Entomology* 43: 595-618.
- Scott, R.E., L.J. Roberts, and C.J. Cadbury. 1972. "Bird Deaths from Power Lines at Dungeness." *British Birds* 65: 273-286.
- Sheridan, G. 2009. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S19938868.
- Sheviak, C.J., and M.L. Bowles. 1986. "The Prairie Fringed Orchids: A Pollinator-isolated Species Pair. *Rhodora* 88: 267-290.
- Shriner, M.K. 2007. Letter from Misty Shriner, Western Area Power Administration, to Richard Grosz, Special Agent, USFWS, RE: Two Plover Mortalities on the Audubon Causeway. August 2, 2007.
- Sieg, C.H. 1997. "The Mysteries of a Prairie Orchid." *Endangered Species Bulletin* XXII, no. 4: 12-13.
- Sieg, C.H., and A.J. Bjugstad. 1994. "Five Years of Following the Western Prairie Fringed Orchid (*Platanthera praeclara*) on the Sheyenne National Grassland, North Dakota." In *Spirit of the Land, our Prairie Legacy*, edited by R.G. Wickett, P.D. Lewis, A. Woodliffe, and P. Pratt, 141-146. Windsor, Ontario, Canada: Department of Parks and Recreation.
- Sieg, C.H., and P.M. Wolken. 1999. "Dynamics of a Threatened Orchid in Flooded Wetlands." In *The Central Nebraska Loess Hills Prairie: Proceedings of the Sixteenth North American Prairie Conference*, edited by J.T. Springer, 193-201.

- Sieg, C.H., and R.M. King. 1995. "Influence of Environmental Factors and Preliminary Demographic Analyses of a Threatened Orchid, *Platanthera praeclara*." *American Midland Naturalist* 134: 307-323.
- Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. 2018. Web Soil Survey. Accessed November 19, 2018. Retrieved from: https://websoilsurvey.sc.egov.usda.gov/.
- South Dakota Game, Fish, and Parks (SDGFP). 2008. Email Response (Two Emails) to Data Request from D. Backlund (SDGFP) to P. Lorenz (AECOM). South Dakota Natural Heritage Program. July 9, 2008.
 - ____. 2018. *State T&H Species Status Reviews Approved by SDGFP Commission 5 April 2018*. Accessed January 3, 2019. Retrieved from: https://gfp.sd.gov/UserDocs/nav/status-reviews.pdf.
- South Dakota Natural Heritage Program (SDNHP). 2018. Element Occurrence GIS Shapefile. Received July 24, 2018.
 - _____. 2019. Element Occurrence GIS Shapefile. Received January 8, 2019.
- Sporer, M.K., J. Dwyer, B. Gerber, R. Harness, and A. Pandey. 2013. "Marking Power Lines to Reduce Avian Collisions Near the Audubon National Wildlife Refuge, North Dakota." *Wildlife Society Bulletin* 37, no. 4. doi: 10.1002/wsb.329.
- Stehn, T. V., and C.L. Haralson-Strobel. 2014. "An Update on Mortality of Fledged Whooping Cranes in the Aransas/Wood Buffalo Population." *Proceedings of the North American Crane Workshop* 12: 43-50.
- Stehn, T.V., and T. Wassenich. 2008. "Whooping Crane Collisions with Power Lines: An Issue Paper. *Proceedings of the North American Crane Workshop* 10: 25-36.
- Stolz, S., and B. Parkin. 2016. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S30638967.
- Tacha, M., A. Bishop, and J. Brei. 2010. "Development of the Whooping Crane Tracking Project Geographic Information System." *Proceedings of the North American Crane Workshop* 11: 98-104.
- The Pallid Sturgeon Recovery Program. 2013. Webpage. Accessed on September 19, 2019. Retrieved from: http://www.pallidsturgeon.org/about/reproduction/
- Thompson, L.S. 1978. "Mitigation through Engineering and Habitat Modification." In *Effects of Transmission Lines on Birds in Flight*, edited by M. L. Avery, 51–92. Washington D.C.: U.S. Fish and Wildlife Service.
- TransCanada Keystone Pipeline, L.P. (Keystone). 2018a. Response to "Data Request No. 67" for North Taylor Creek Crossing. November 28, 2018.

_____. 2018b. Response to "Data Request No. 63" for Northern Long-Eared Bat and Rufa Red Knot. November 30, 2018.

____. 2018c. Response to "Data Request No. 64" for Western Prairie Fringed Orchid (WPFO). November 30, 2018.

_____. 2018d. Response to "Data Request No. 37" for Electrical Distribution Lines and Substations. December 4, 2018.

_____. 2019. Response to "Data Request No. 123" for Recent surveys and Project changes. September 5, 2019.

- Truitt, B.R., B.D. Watts, B.L. Brown, W. Dunstan. 2001. "Red Knot Densities and Invertebrate Prey Densities on the Virginia Barrier Islands." *Wader Study Group Bulletin* 95: 12.
- U.S. Army Corps of Engineers (USACE). 2011. Final Programmatic Environmental Impact Statement for the Mechanical and Artificial Creation and Maintenance of Emergent Sandbar Habitat in the Riverine Segments of the Upper Missouri River. Accessed November 20, 2019. Retrieved from: https://usace.contentdm.oclc.org/digital/collection/p16021coll7/id/7662/

U.S. Department of State (Department). 2011a. Biological Assessment. May 2011.

_____. 2011b. *Final Environmental Impact Statement Keystone XL Project*. Accessed January 16, 2019. Retrieved from: https://www.federalregister.gov/documents/2011/09/06/2011-22689/final-environmental-effect-statement-for-the-proposed-keystone-xl-project

____. 2012a. Draft Supplemental Environmental Impact Statement Keystone XL Project.

____. 2012b. *Final Biological Assessment for the Keystone XL Project*. Volume I. December 21, 2012. Copies available within Department (2014).

____. 2014. *Final Supplemental Environmental Impact Statement for the Keystone XL Project*. January 2014. Accessed January 17, 2019. Retrieved from: https://2012-keystonepipeline-xl.state.gov/finalseis/index.htm.

____. 2015. RE: Request for Reinitiating of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings. FWS-NE: 2013-164. Accessed January 17, 2019. Retrieved from: https://www.state.gov/wpcontent/uploads/2019/02/Department-Letter-to-USFWS-to-Reinitiate-Section-7-Consultations-on-Rufa-Red-Knot.pdf

____. 2018. Draft Supplemental Environmental Impact Statement Keystone XL Mainline Alternative Route. September 2018. Accessed January 17, 2019. Retrieved from: https://keystonepipeline-xl.state.gov/documents/organization/286279.pdf

U.S. Fish and Wildlife Service (USFWS). 1980. Selected Vertebrate Endangered Species of the Seacoast of the United States–The Whooping Crane. U.S. Fish and Wildlife Service, Biological Services Program; FWS/OBS-80/01.3. 10 pp.

1987. Atlantic Coast Piping Plover Recovery Plan. USFWS. Newton Corner, Massachusetts.

____. 1988a. *Black-Footed Ferret Recovery Plan*. U.S. Fish and Wildlife Service, Denver, Colorado.

____. 1988b. *Recovery Plan for Piping Plover Breeding in the Great Lakes and Northern Great Plains*. U.S. Fish and Wildlife Service. Twin Cities, Minnesota.

____. 1989. Black-Footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. U.S. Fish and Wildlife Service. Denver, Colorado and Albuquerque, New Mexico. 10 pp. + Appendices.

____. 1990. *Recovery Plan for the Interior Least Tern* (Sterna antillarum). U.S. Fish and Wildlife Service. Twin Cities, Minnesota.

____. 1991. *American Burying Beetle* (Nicrophorus americanus) *Recovery Plan*. Newton Corner, Massachusetts.

____. 1993. *Recovery Plan for the Pallid Sturgeon* (Scaphirhynchus albus). U.S. Fish and Wildlife Service. Denver, Colorado.

_____. 1994. *Draft Revised Recovery Plan for Piping Plover*, Charadrius melodus, *Breeding in the Great Lakes and Northern Great Plains of the United States*. June 28, 1994. U.S. Fish and Wildlife Service, Twin Cities, Minnesota.

____. 1996. *Western Prairie Fringed Orchid Recovery Plan* (Platanthera praeclara). U.S. Fish and Wildlife Service. Fort Snelling, Minnesota.

_____. 2003. Status of Gray Wolf Recovery, Weeds 3/28 to 4/04, 2003.

_____. 2004. U.S. Fish and Wildlife Service 2004 Biological Opinion on the Western Area Power Administration Transmission Lines across the Snake Creek Embankment.

____. 2006. *Biological Opinion on the Platte River Recovery Implementation Program*. June 16, 2006. U.S. Fish and Wildlife Service, Nebraska Ecological Services Field Office. Accessed September 24, 2019. Retrieved from: https://platteriverprogram.org/ sites/default/files/PubsAndData/ProgramLibrary/USFWS% 202006_PRRIP% 20Biologica 1%20Opinion.pdf

____. 2007. Western Prairie Fringed Orchid *Platanthera praeclara*. Accessed December 10, 2012. Retrieved from: http://www.fws.gov/southdakotafieldoffice/ORCHID.HTM.

_____. 2008a. *American Burying Beetle* (Nicrophorus americanus) *5-Year Review: Summary and Evaluation*. U.S. Fish and Wildlife Service. Concord, New Hampshire.

____. 2008b. *Black-Footed Ferret* (Mustela nigripes) *5-Year Status Review: Summary and Evaluation*. U.S. Fish and Wildlife Service. South Dakota Field Office, Pierre, South Dakota.

____. 2008c. Letter. U.S. Fish and Wildlife Service, Ecological Services, Nebraska Field Office. October 8, 2008.

____. 2008d. Meeting Notes. Fish, Wildlife, and Sensitive Species Potentially Occurring along the Project Route in Nebraska. Correspondence between J. Cochnar (USFWS, Nebraska Ecological Services Field Office) and P. Lorenz (ENSR). May 5, 2008.

____. 2008e. Meeting Notes. Fish, Wildlife and Sensitive Species potentially Occurring along the Project Route in Montana. Correspondence between L. Hanebury (USFWS) and P. Lorenz, C. Barnes (ENSR). May 8, 2008.

____. 2009. *Whooping Cranes and Wind Development: An Issue Paper*. U.S. Fish and Wildlife Service, Regions 2 and 6.

____. 2010. Region 6 Guidance for Minimizing Effects from Power Line Projects within the Whooping Crane Migration Corridor. February 4, 2010. Ecological Services, Region 6, Mountain Prairie Region. Denver, Colorado.

____. 2011a. Least tern and piping plover survey report. U.S. Fish and Wildlife Service, Nebraska Field Office. 25 pp.

____. 2011b. Personal Communication. Martha Tacha, U.S. Fish and Wildlife Service, Grand Island, and John Carlson, Bureau of Land Management, Glasgow, Montana. January 6, 2011.

____. 2012. Technical Assistance Letter for the TransCanada Keystone XL Pipeline. Nebraska Ecological Services Field Office. Grand Island, Nebraska.

_____. 2013a. Biological Opinion on the Effects to Threatened and Endangered Species from the Issuance of a Presidential Permit to TransCanada Keystone XL Pipeline (Keystone) by the U.S. Department of State for the Proposed Construction, Operation, and Maintenance of the Keystone XL Pipeline and Associated Facilities at the Border and Interrelated and Interdependent Actions. May 15, 2013. FWS-NE: 2013-164. Accessed January 17, 2019. Retrieved from: https://2012-keystonepipeline-xl.state.gov/documents/ organization/209745.pdf.

____. 2013b. Interior Least Tern (Sternula antillarum) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service. Jackson, Mississippi. 58 pp. + appendix.

____. 2013c. *Recovery Plan for the Black-footed Ferret* (Mustela nigripes). Second Revision. U.S. Fish and Wildlife Service. Denver, Colorado.

_____. 2014a. *American Burying Beetle (ABB)* Nicrophorus americanus *Species account*. June 4, 2014. U.S. Fish and Wildlife Service, Oklahoma Ecological Services Field Office. Accessed September 18, 2019. Retrieved from: https://www.fws.gov/southwest/ es/oklahoma/Documents/ABB/American%20Burying%20Beetle%20Biology.pdf

____. 2014b. News Release: *Critical Habitat for the Topeka Shiner Designated in Iowa, Minnesota, and Nebraska*. Accessed June 22, 2018. Retrieved from: https://www.fws.gov/midwest/endangered/fishes/pdf/tosh-nr-finalCH.pdf.

____. 2014c. *Northern Long-eared bat Interim Conference and Planning Guidance*. U.S. Fish and Wildlife Service, Regions 2, 3, 4, 5, and 6.

____. 2014d. *Revised Recovery Plan for the Pallid Sturgeon* (Scaphirhynchus albus). U.S. Fish and Wildlife Service. Denver, Colorado.

____. 2014e. *Rufa Red Knot Background Information and Threats Assessment*. Supplement to *Endangered and Threatened Wildlife and Plants; Final Threatened Status for the Rufa Red Knot* (Calidris canutus rufa). Docket No. FWS-R5-ES-2013-0097; RIN AY17. November 2014. U.S. Fish and Wildlife Service, Regions 2, 3, 4, 5, and 6.

____. 2015. RE: Request for Reinitiating of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings. FWS-NE: 2013-164. Accessed January 17, 2019. Retrieved from: https://www.state.gov/wpcontent/uploads/2019/02/Department-Letter-to-USFWS-to-Reinitiate-Section-7-Consultations-on-Rufa-Red-Knot.pdf.

____. 2016a. *Draft Revised Recovery Plan for the Northern Great Plain Piping Plover* (Charadrius melodus). Accessed December 21, 2018. Retrieved from: https://www.fws.gov/mountain-prairie/es/species/birds/pipingplover/2016/Vol%20I% 20NGP%20Draft%20Revised%20Breeding%20Rec%20Plan.pdf.

_____. 2016b. *Key to the northern long-eared bat 4(d) rule for federal actions that may affect northern long-eared bat*. Accessed June 6, 2017. Retrieved from: https://www.fws.gov/midwest/endangered/mammals/nleb/KeyFinal4dNLEBFedProjects. html.

____. 2016c. *Whooping Crane Update September 16, 2016*. Accessed January 3, 2019. Retrieved from: https://www.fws.gov/nwrs/threecolumn.aspx?id=2147594180.

____. 2017a. Draft Environmental Impact Statement on Issuance of an Incidental Take Permit and Implementation of a Habitat Conservation Plan for the R-Project Transmission Line. May 2017.

____. 2017b. Request for Reinitiating of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings. FWS-NE: 2013-164. Accessed January 17, 2019. Retrieved from: https://www.state.gov/wp-content/uploads/ 2019/02/Department-Letter-to-USFWS-to-Reinitiate-Section-7-Consultations-on-Northern-Long-Eared-Bat-et-al.pdf

____. 2017c. *USFWS Administrative Waterfowl Flyway Boundaries*. Accessed November 28, 2018. Retrieved from: https://ecos.fws.gov/ServCat/Reference/Profile/42276.

____. 2017d. *Whooping Crane Fact Sheet and Survey Protocol*. U.S. Fish and Wildlife Service. Wood River, Nebraska.

____. 2018a. *Endangered, Threatened, Proposed and Candidate Species Found in Nebraska*. Accessed January 3, 2019. Retrieved from: https://www.fws.gov/nebraskaes/ species.php. ____. 2018b. *Northern Long-eared Bat Range Map.* Accessed November 21, 2018. Retrieved from:

https://www.fws.gov/midwest/endangered/mammals/nleb/nlebrangemap.html.

____. 2018c. *Provisional Whooping Crane Telemetry Project Database*. U.S. Fish and Wildlife Service, Nebraska Ecological Services Field Office. Received December 14, 2018.

____. 2018d. *Provisional Whooping Crane Telemetry Project Database*. U.S. Fish and Wildlife Service Nebraska Ecological Services Field Office. Received December 14, 2018.

____. 2018e. Topeka Shiner (*Notropis topeka*). U.S. Fish and Wildlife Service species profile. Accessed June 22, 2018. Retrieved from: https://ecos.fws.gov/ecp0/profile/ speciesProfile?spcode=E07R.

____. 2018f. Topeka Shiner (*Notropis topeka*). Accessed June 22, 2018. Retrieved from: https://www.fws.gov/midwest/endangered/fishes/TopekaShiner/index.html.

____. 2018g. Unpublished. *Memorandum for the Record*. Review of: "Take Calculation for Whooping Cranes (Grus Americana) for the Nebraska Public Power District's R-Project Transmission Line" (September 10, 2018 draft) prepared by the Nebraska Field Office (NEFO) of the U.S. Fish and Wildlife Service (USFWS); and a proposed use of reasonably certain knowledge to assess the risk of power-line strikes for the R-Project. November 7, 2018.

____. 2019a. Biological Opinion Proposed Issuance of an Incidental Take Permit for the Federally Endangered American Burying Beetle *Nicrophorus americanus*. Nebraska Public Power District R-Project Transmission Line. TAILS No. 06E00000-2019-F-0001. June 4, 2019. Accessed September 19, 2019. Retrieved from: https://www.fws.gov/ nebraskaes/Library/Signed_RProject_BiologicalOpinion_06042019.pdf

____. 2019b. Information for Planning and Conservation (IPaC) Official Species List. Montana Ecological Services Field Office. Received September 3, 2019.

____. 2019c. Information for Planning and Conservation (IPaC) Official Species List. Nebraska Ecological Services Field Office. Received September 3, 2019.

____. 2019d. Information for Planning and Conservation (IPaC) Official Species List. South Dakota Ecological Services Field Office. Received September 3, 2019.

____. 2019e. Northern Long-Eared Bat Final 4(d) Rule White-Nose Syndrome Zone Around WNS/Pd Positive Counties/Districts. July 25, 2019. Accessed September 2, 2019. Retrieved from: https://www.fws.gov/Midwest/endangered/mammals/nleb/pdf/WNSZone.pdf

____. 2019f. Species Status Assessment Report for the American Burying Beetle (Nicrophorus americanus). Version 1.0. February 2019. Accessed September 14, 2019. Retrieved from: https://www.fws.gov/southwest/es/Oklahoma/Documents/ABB/Listing/ ABBSSA_Final_V1.0_Feb2019.pdf

- U.S. Fish and Wildlife Service and National Marine Fisheries Service (USFWS and NMFS). 1998. Endangered Species Consultation Handbook: Procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act.
- U.S. Forest Service. 2017. Assessment Forest Plan Revision: Final Terrestrial Wildlife Report. Accessed November 28, 2018. Retrieved from: https://www.fs.usda.gov/Internet/FSE_ DOCUMENTS/fseprd533114.pdf.
- U.S. Geological Survey (USGS). 2006. North Dakota's Endangered and Threatened Species Western Prairie Fringed Orchid *Platanthera praeclara*. USGS Northern Prairie Wildlife Research Center.

_____. 2007. "Sturgeon Research Update: Confirmed Pallid Sturgeon Spawning in the Missouri River in 2007". USGS Fact Sheet 2007–3053. July 2007. Accessed on September 19, 2019. Retrieved from: https://pubs.usgs.gov/fs/2007/3053/pdf/FS2007-3053.pdf

- WESTECH Environmental Services, Inc. 2015. Northern long-eared bat and red knot habitat assessment on the proposed Keystone XL Pipeline Project. 17 p + appendices.
- Wiens, T.P. 1986. "Nest-site Tenacity and Mate Retention in the Piping Plover," MS thesis, University of Minnesota, Duluth.
- Willemssens, K. 2015. "Soil preferences of Nicrophorus beetles and the effects of compaction on burying behavior." Dissertations & Theses in Natural Resources. University of Nebraska, Lincoln, NE. Accessed November 26, 2019. Retrieved from: http://digitalcommons.unl.edu/natresdiss/112
- Williamson, R. 2018. eBird Checklist. Accessed November 13, 2018. Retrieved from: https://ebird.org/view/checklist/S29037757.
- Wilson, D.S., and J. Fudge. 1984. "Burying Beetles: Intraspecific Interactions and Reproductive Success in the Field." *Ecological Entomology* 9: 195-203.
- Wilson, R, ed. 2004. *Pallid Sturgeon Recovery Update* 14. Accessed January 16, 2019. Retrieved from: https://www.fws.gov/mountain-prairie/MissouriRiver/Pallid_Update_04.pdf.
- Wolken, Paige M., C. Hull Sieg, and S.E. Williams. 2001. "Quantifying Suitable Habitat of the Threatened Western Prairie Fringed Orchid." *Journal of Range Management* 54: 611-616.
- Wright, G.D., T.J. Smith, R.K. Murphy, J.T. Runge, and R.R. Harms. 2009. "Mortality of Cranes (Gruidae) Associated with Power Lines over a Major Roost on the Platte River, Nebraska. *The Prairie Naturalist* 41, no. 3/4: 116-120.

- Wuczyński, A. 2005. "Habitat use and hunting behavior of Common Buzzards Buteo buteo wintering in south-western Poland." *Acta Ornitholgica* 40(2): 147-154.
- Yee, M.L. 2008. Testing the Effectiveness of an Avian Flight Diverter for Reducing Avian Collisions with Distribution Power Lines in the Sacramento Valley, California. California Energy Commission, PIER Energy-Related Environmental Research Program. CEC-500-2007122.
- Yoders, J. 2019. "Nebraska Flood Exposes Weak Points." *Engineering News-Record*. BNP Media. April 3, 2019. Accessed November 19, 2019. Retrieved from https://www.enr.com/articles/46616-nebraska-flood-exposes-weak-points.

APPENDIX A

Letters of Section 7 Consultation and Supporting Communications

Letters of Section 7 Consultation and Supporting Communications

Subject or Pump Station	Sender/Receiver	Date
PS 09	Big Flat to USFWS	2010 09 09
PS 20 21	Rosebud to USFWS	Undated
PS 10 11	NorVal to USFWS	2010 09 13
PS 13	Tongue River to USFWS	2010 09 17
PS 12	McCone to USFWS	2010 10 13
PS 18 19	West Central to USFWS	2010 11 10
PS 27 29	Westar Energy to USFWS	2010 11 12
PS 22 23 24	NPPD to USFWS	2010 09 14
PS 22 23 24	USFWS to NPPD	2010 06 01
PS 24	NGPC to Nebraska Power Review Board	2010 06 10
PS 22 23 24	USFWS to NPPD	2010 06 10
PS 23	NGPC to Nebraska Power Review Board	2010 06 10
PS 22 23 24	USFWS to NPPD	2010 06 01
PS 22	NGPC to Nebraska Power Review Board	2010 06 10
PS 15 16 17	Grand to USFWS	2010 10 14
Big Bend to Witten	USFWS to AECOM	2012 02 08
PS 09	Big Flat to USFWS	2012 12 18
PS 09	USFWS to Big Flat	2013 02 19
PS 09	Big Flat to USFWS	2013 02 25
PS 10 11	NorVal to USFWS	2012 12 18
PS 10 11	USFWS to NorVal	2013 02 19
PS 10 11	NorVal to USFWS	2013 04 08
PS 12	McCone to USFWS	2013 03 01
PS 12	McCone to USFWS	2012 12 21
PS 12	USFWS to McCone	2013 02 19
PS 13	Tongue River to USFWS	2013 01 09
PS 13	USFWS to Tongue River	2013 02 19
PS 13	Tongue River to USFWS	2013 04 10
PS 14	MDU to USFWS	2012 12 28
PS 14	MDU to USFWS	2013 02 06
PS 14	USFWS to MDU	2013 02 19
PS 14	MDU to USFWS	2013 04 24
PS 15 16 17	Grand to USFWS	2013 01 10
PS 15 16 17	USFWS to Grand	2013 01 24
PS 18 19	West Central to USFWS	2012 12 18
PS 18 19	USFWS to West Central	2013 01 24
PS 18 19	West Central to USFWS	2013 02 25
PS 20 21	Rosebud to USFWS	2012 12 18

Continued on next page

Subject or Pump Station	Sender/Receiver	Date
PS 20 21	USFWS to Rosebud	2013 01 24
PS 22 23 24	NPPD to NGPC	2012 12 27
PS 22 23 24	NPPD to USFWS	2012 12 27
PS 22 23 24 25 26	NPPD to USFWS	2013 03 04
PS 27 29	Westar Energy to USFWS	2012 12 19
PS 27 29	Westar Energy to USFWS	2013 03 04
Greater Sage-Grouse	SDGFP to TransCanada Pipelines Ltd.	2013 03 04
Red Knot BA	Department of State to USFWS	2015 07 09
Red Knot concurrence	USFWS to Department of State	2015 08 27
NLEB BA	Department of State to USFWS	2017 03 15
NLEB concurrence	USFWS to Department of State	2017 03 16

BA = Biological Assessment; MDU = Montana-Dakota Utilities Co.; NGPC = Nebraska Game and Parks Commission; NLEB = Northern long-eared bat; NPPD = Nebraska Public Power District; PS = pump station; SDGFP = South Dakota Game, Fish, and Parks; USFWS = U.S. Fish and Wildlife Service.



September 9, 2010

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Big Flat Electric Co-op., Inc, a power provider located in Malta, Montana, is providing electric service to Pump Station #9 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

incerely. WINAN OMMAL leanne Barnard

Manager, Big Flat Electric Co-op., Inc.



ROSEBUD ELECTRIC COOPERATIVE, INCORPORATED

P.O. Box 439 512:Rostaud Avenue Gregory, SD 57533 PHO46: 605-835-9624 Toll Free: 1-888-464-9304 EAX: 605-835-9649 EMAIL: fosebuidelectric.com

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Rosebud Electric, a power provider located in Gregory SD, is providing electric service to Pump Station 20 and 21 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

Gary Clayton, Manager Rosebud Electric Cooperative Inc.



P.O. Box 951 Glasgow, MT 59230 Phone (406) 228-9351 Fax (406) 367-9306 P.O. Box 287 Opheim, MT 59250 Phone (406) 762-3411 Fax (406) 762-3352

September 13, 2010

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dcar Mr. Cochnar:

NorVal Electric Cooperative, Inc., a power provider located in Glasgow, MT, is providing electric service to Pump Stations 10 and 11 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

Craig Herbert General Manager NorVal Electric Cooperative, Inc



POINT OF INTERCONNECTION AND COOPERATIVE INTERCONNECTION FACILITIES

Point of Interconnection:

The Point of Interconnection between the NorVal and TransCanada Electrical Facilities at Pump Station #10 shall be at the 115/6.9 kilovolt substation, herein referred to as the Black Coulee Substation. An air break switch (ABS) on the 6.9 kV bus shall be established as the demark point between the two entities.

NorVal shall construct 51.0 miles of 115 kilovolt transmission line from the Fort Peck substation to the pump location (PS #10) located in Section 01, Township 31N, Range 37E.

The NorVal Coal Hill 230Kv / 6.9 kV substation, located at or near Customer pump station #11, and all associated substation electrical equipment required under RUS specifications and approved engineering design standards.

The NorVal 230Kv substation interconnecting the Western Area Power Administration 230 Kv line from Fort Peck to Glendive Montana. This shall be near the Customer's pump station #11 located in Township 25 North, Range 42 East, Section 01.



BILLINGS OFFICE: 3521 GABEL ROAD, BILLINGS, MONTANA 59102 • PHONE: 406-259-9933 • FAX: 408-259-3441

September 17, 2010

ELECTRICAL CONSULTANTS, INC.

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Tongue River Electric Cooperative, Inc, a power provider located in Ashland, MT is providing electric service to Pump Station 13 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Please feel free to contact me at 406-784-2341 with any questions or comments you may have. My address is also shown below:

Tongue River Electric Cooperative PO Box 138 Ashland, MT 59003

Sincerely,

Alan See, General Manager Tongue River Electric Cooperative

CORPORATE OFFICE 3521 GABEL, ROAD BILLINGS, MT 59102 PHONE: 406-259-9033 FAX: 400-259-1104 EMAIL: contact-selfechillogs.com SALT LAKE CITY OFFICE: 650 WEST 700 SOLTH WOODS CROSS, UT 84067 PHONE: 801-202-9654 FAX: 801-202-9654 EMAIL: contact :usingenic.com

EMAIL SOLDED SHIP

MADISON OFFICE 2850 ROYAL AVENUE #300 MONONA, WI 53713 PRONE 60#240-1088 FAX: 60#240-1879 EMAIL: contact: collectmathion.cms



McCONE ELECTRIC CO-OP., INC.

P.O. Box 368 CIRCLE, MONTANA 59215 TELEPHONE (406) 485-3430 (800) 684-3605 FAX (406) 485-3397

October 13, 2010

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

McCone Electric Cooperative Inc, a power provider located in Circle Montana, is providing electric service to Pump Station 12 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act. The attached letter was reviewed and the electrical service provided by McCone is outside of the Whooping Crane Migratory Corridor, and the construction of the proposed line will not likely impact the whooping crane.

However, we would still like to consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed is a map showing the proposed location of the power line we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Best regards, McCone Electric Co-op., Inc.

Mike C. Kays General Manager

Enclosure: PS#12 Final Transmission Route Map



PO Box 17 204 Main St. Murdo SD 57559

Phone (605) 669-2472 or 1-800-242-9232 Fax (605) 669-2358 Email wcec@wce.coop

November 10, 2010

John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

West Central Electric Cooperative, Inc., a power provider located in Murdo, South Dakota, is providing electric service to Pump Stations 18 and 19 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

WEST CENTRAL ELECTRIC CO-OP., INC.

Steven J. Reed CEO/Manager

SJR:bm



November 12, 2010

John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Dear Mr. Cochnar,

This letter is sent to assure you of Westar Energy's intent to comply with USF&WS regulations in our construction of lines associated with the Keystone XL Pipeline Project in Kansas. We routinely work with Dan Mulhern and Mike LeValley of your Ecological Services office in Manhattan, Kansas. If you have questions or concerns, please don't hesitate to contact me.

Sincerely,

3md Curelus

Brad Loveless Director, Biology & Cons. Programs Westar Energy

cc: Stacy Kramer, Westar Energy -Larry Sibbald, Trans Canada



Nebraska Public Power District

Always there when you need us

September 14, 2010

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Nebraska Public Power District Transmission Lines (Keystone XL Pipeline Pump Stations #22, #23, and #24)

Dear Mr. Cochnar:

It is Nebraska Public Power Districts (NPPD) understanding that as a result of recent conversations between the USFWS and TransCanada that each power provider associated with the Keystone XL Project is being asked to provide USFWS with a letter indicating the willingness of power providers to work with USFWS regarding threatened and endangered species.

Nebraska Public Power District (NPPD) is a supplier of retail and wholesale electric service in Nebraska. Pump stations associated with the Keystone XL Project will require electric service and will represent significant electric loads to the local electric service provider. While NPPD will not be providing electric service directly to these pump stations at a retail level, NPPD will provide electric service to NPPD wholesale customers, who in turn will provide electric service to the pump stations. In order for the wholesale customers to provide reliable electric service to Keystone XL Pump Stations #22, #23, and #24, NPPD must construct additional 115 kV transmission lines. Accordingly, NPPD has established three separate 115 kV transmission line projects.

NPPD follows a very structured route identification and selection process with an emphasis on public involvement, including coordination with various agencies that may have jurisdiction in the line route study areas. For these three transmission line projects, the route selection process was initiated by NPPD in June 2009. NPPD held initial meetings with the Nebraska Game and Parks Commission (NGPC) and the US Fish & Wildlife Service (USFWS) to provide an overview of the projects and to begin discussions regarding threatened and endangered species in July 2009. At that time, primary points of contact with the NGPC (Michelle Koch) and the USFWS (Bob Harms) were also established. NPPD continued to coordinate with the NGPC and the USFWS at each step of the line route selection process including identification of line route corridors, alternate line routes and final route selection. Line routes for these three projects were finalized in early September 2010.

NPPD has demonstrated its commitment to coordinate and consult with the USFWS and the NGPC to address impacts of these three transmission line projects during route selection. Copies of letters NPPD received from both the NGPC and the USFWS related to these projects which demonstrate NPPD's coordination efforts are attached. NPPD is committed to continue such coordination with both agencies regarding measures that may need to be incorporated into the design and/or construction of the transmission lines to address potential impacts to threatened and endangered species that may occur in certain specific areas along the line routes. Prior to the beginning of construction, NPPD, the NGPC and the USFWS will determine and agree upon what measures are specifically warranted for each line route.

Copies of maps showing the routes for the 115 kV transmission lines to be built to service Keystone XL Project pump stations #22, #23 and #24 are enclosed.

Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr. Environmental Manager

Attachments

Cc: Robert Harms (USFWS) Michelle Koch (NGPC) Larry Sibbald (TransCanada) Don Veseth (NPPD)



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services Nebraska Field Office 203 West Second Street Grand Island, Nebraska 68801

June 1, 2010

Mr. Joe L. Citta Corporate Environmental Manager Nebraska Public Power District 1414 15th Street PO Box 499 Columbus, NE 68602-0499

Dear Mr. Citta:

Please make reference to a letter from the Nebraska Public Power District (NPPD) dated May 10, 2010, which summarized discussions at a recent April 7, 2010, meeting about a proposed 115 kV transmission line construction project extending from Clarks to Central City, Nebraska. As you know, representatives of the NPPD, U.S. Fish and Wildlife Service, and Nebraska Game and Parks Commission previously met on several occasions during the planning phases of this project to identify and discuss potential threatened and endangered species impacts. We acknowledge and commend NPPD's commitment to continue coordination with us to address potential impacts to these species. Measures to address and/or avoid potential impacts include species surveys and potential temporal avoidance in areas which provide suitable habitat. Implementation of agreed upon measures where suitable habitat is present along the final line route would satisfactorily address impacts to threatened and endangered species.

We appreciate the opportunity to review and comment on the proposed transmission line project and NPPD's willingness to involve the resource agencies throughout project planning. If you have any questions regarding these comments, please contact Mr. Robert Harms of this office at Robert_Harms@fws.gov or telephone number (308) 382-6468, extension 17.

John Cochra

John Cochnar Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)



Nebraska Game and Parks Commission

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641 • Fax: 402-471-5528

June 10, 2010

Sara Hayek Nebraska Power Review Board 301 Centennial Mall South, 5th Floor Lincoln, NE 68509

Re: Application No. PRB-3629, Clarks to Central City, 9 miles of 115 kV transmission line, Merrick and Polk Counties, Nebraska

Dear Ms. Hayek:

Please make reference to your letter dated May 24, 2010. This letter is in response to your request for a review of this project's potential impacts to threatened and endangered species in Merrick and Polk Counties in Nebraska. As we understand it, the project involves constructing 9 miles of 115 kV line to provide an energy source for the TransCanada Keystone XL Pipeline Pumping Station (PS-24). We have completed our review of the proposed sites under <u>Neb. Rev. Stat.</u> § 37-807 (3) of the Nongame and Endangered Species Conservation Act and we offer the following comments.

Staff from the Nebraska Game and Parks Commission (NGPC) and the Nebraska Public Power District (NPPD) have had numerous meetings dating back to July 2009 to discuss the Clarks to Central City transmission line project. Staff from the U.S. Fish and Wildlife Service, Nebraska Field Office, Grand Island, was also present at those meetings. Through the course of these meetings, NPPD has narrowed the project from the initial study area to corridors to preferred and alternative routes. At each of these phases, NGPC has advised NPPD on potential impacts to threatened and endangered species as well as other species protected under federal laws, such as the Migratory Bird Treat Act and the Bald and Golden Eagle Protection Act. NPPD has incorporated this information into the routing process to try to avoid impacts to threatened and endangered species and their habitats when possible.

The project corridor and preferred and alternative routes for this project are within the range of the following state listed threatened and endangered species:

Whooping Crane (*Grus americana*) -- state and federal endangered Interior Least Tern (*Sternula antillarum athalassos*) -- state and federal endangered Piping Plover (*Charadrius melodus*) -- state and federal threatened Western Prairie Fringed Orchid (*Platanthera praeclara*) -- state and federal threatened Small White Lady's Slipper (*Cypripedium candidum*) -- state threatened River Otter (*Lutra canadensis*) -- state threatened

Through the aforementioned discussions, NPPD has agreed to determine if suitable habitat for each of these species is present within the area that will be impacted by construction activities. If suitable habitat is present, then NPPD will conduct additional surveys to determine if these species are present. In the event one or more of these species are present, then NGPC and NPPD will cooperatively develop conservation measures to address potential impacts.



Since NPPD has taken the appropriate steps through the consultation process to avoid adverse impacts to threatened and endangered species, we have no objection to the selected corridor or the routes within the corridor. Additionally, NPPD has committed to continued coordination with our agency as the final route is selected and constructed. They have agreed to mark certain portions of the line with bird diverters if necessary and to conduct appropriate surveys for the threatened and endangered species listed above.

Therefore, we have determined this project "may affect but is not likely to adversely affect" state-listed threatened or endangered species. We made this determination based on discussions and meetings with NPPD, the continued commitment to coordinate with our agency, a review of the material you sent, aerial photographs, topographic maps and our Nebraska Natural Heritage Database.

Based upon the submitted information, we have no objection to the proposal as currently planned. If the proposed project is changed or new information regarding threatened or endangered species becomes available, then this determination is no longer valid and further consultation with the Nebraska Game and Parks Commission will be necessary.

All federally listed threatened and endangered species are also state listed. For assessment of potential impacts on federally listed, candidate or proposed threatened or endangered species, please contact John Cochnar, Nebraska Field Office, U.S. Fish and Wildlife Service, 203 W. Second St., Grand Island, NE 68801.

Thank you for the opportunity to comment. If you have any questions or need additional information, please feel free to contact me.

Sincerely,

Midnelle RKoch

Michelle R. Koch Environmental Analyst Supervisor Nebraska Natural Heritage Program Nebraska Game and Parks Commission (402) 471-5438, michelle.koch@nebraska.gov

CC: John Cochnar, USFWS Robert Harms, USFWS Joe Citta, NPPD Larry Linder, NPPD



4

United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services Nebraska Field Office 203 West Second Street Grand Island, Nebraska 68801

June 1, 2010

Mr. Joe L. Citta Corporate Environmental Manager Nebraska Public Power District 1414 15th Street PO Box 499 Columbus, NE 68602-0499

Dear Mr. Citta:

Please make reference to a letter from the Nebraska Public Power District (NPPD) dated May 10, 2010, which summarized discussions at a recent April 7, 2010, meeting about a proposed 115 kV transmission line construction project extending from Petersburg to Ericson, Nebraska. As you know, representatives of the NPPD, U.S. Fish and Wildlife Service, and Nebraska Game and Parks Commission previously met on several occasions during the planning phases of this project to identify and discuss potential threatened and endangered species impacts. We acknowledge and commend NPPD's commitment to continue coordination with us to address potential impacts to these species. Measures to address and/or avoid potential impacts include species surveys, habitat avoidance, and capture/relocation procedures in areas which provide suitable habitat. Implementation of agreed upon measures where suitable habitat is present along the final line route would satisfactorily address impacts to threatened and endangered species.

We appreciate the opportunity to review and comment on the proposed transmission line project and NPPD's willingness to involve the resource agencies throughout project planning. If you have any questions regarding these comments, please contact Mr. Robert Harms of this office at Robert_Harms@fws.gov or telephone number (308) 382-6468, extension 17.

Sincerely,

John Cochin

John Cochnar Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)



Nebraska Game and Parks Commission

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641 • Fax: 402-471-5528

June 10, 2010

Sara Hayek Nebraska Power Review Board 301 Centennial Mall South, 5th Floor Lincoln, NE 68509

Re: Application No. PRB-3628, Petersburg to Ericson, 37 miles of 115 kV transmission line, Boone and Wheeler Counties, Nebraska

Dear Ms. Hayek:

Please make reference to your letter dated May 24, 2010. This letter is in response to your request for a review of this project's potential impacts to threatened and endangered species in Boone and Wheeler Counties in Nebraska. As we understand it, the project involves constructing 37 miles of 115 kV line to provide an energy source for the TransCanada Keystone XL Pipeline Pumping Station (PS-23). We have completed our review of the proposed sites under <u>Neb. Rev. Stat.</u> § 37-807 (3) of the Nongame and Endangered Species Conservation Act and we offer the following comments.

Staff from the Nebraska Game and Parks Commission (NGPC) and the Nebraska Public Power District (NPPD) have had numerous meetings dating back to July 2009 to discuss the Petersburg to Ericson transmission line project. Staff from the U.S. Fish and Wildlife Service, Nebraska Field Office, Grand Island, was also present at those meetings. Through the course of these meetings, NPPD has narrowed the project from the initial study area to corridors to preferred and alternative routes. At each of these phases, NGPC has advised NPPD on potential impacts to threatened and endangered species as well as other species protected under federal laws, such as the Migratory Bird Treat Act and the Bald and Golden Eagle Protection Act. NPPD has incorporated this information into the routing process to try to avoid impacts to threatened and endangered species and their habitats when possible.

The project corridor and preferred and alternative routes for this project are within the range of the following state listed threatened and endangered species:

American Burying Beetle (*Nicrophorus americanus*) – state and federal endangered Whooping Crane (*Grus americana*) – state and federal endangered Western Prairie Fringed Orchid (*Platanthera praeclara*) – state and federal threatened Small White Lady's Slipper (*Cypripedium candidum*) – state threatened

Through the aforementioned discussions, NPPD has agreed to determine if suitable habitat for each of these species is present within the area that will be impacted by construction activities. If suitable habitat is present, then NPPD will conduct additional surveys to determine if these species are present. In the event one or more of these species are present, then NGPC and NPPD will cooperatively develop conservation measures to address potential impacts.

Since NPPD has taken the appropriate steps through the consultation process to avoid adverse impacts to threatened and endangered species, we have no objection to the selected corridor or the routes within the corridor. Additionally, NPPD has committed to continued coordination with our agency as the final route is



selected and constructed. They have agreed to mark certain portions of the line with bird diverters if necessary and to conduct appropriate surveys for the threatened and endangered species listed above.

Therefore, we have determined this project "may affect but is not likely to adversely affect" state-listed threatened or endangered species. We made this determination based on discussions and meetings with NPPD, the continued commitment to coordinate with our agency, a review of the material you sent, aerial photographs, topographic maps and our Nebraska Natural Heritage Database.

Based upon the submitted information, we have no objection to the proposal as currently planned. If the proposed project is changed or new information regarding threatened or endangered species becomes available, then this determination is no longer valid and further consultation with the Nebraska Game and Parks Commission will be necessary.

All federally listed threatened and endangered species are also state listed. For assessment of potential impacts on federally listed, candidate or proposed threatened or endangered species, please contact John Cochnar, Nebraska Field Office, U.S. Fish and Wildlife Service, 203 W. Second St., Grand Island, NE 68801.

Thank you for the opportunity to comment. If you have any questions or need additional information, please feel free to contact me.

Sincerely,

MichellerKoch

Michelle R. Koch Environmental Analyst Supervisor Nebraska Natural Heritage Program Nebraska Game and Parks Commission (402) 471-5438, michelle.koch@nebraska.gov

CC: John Cochnar, USFWS Robert Harms, USFWS Joe Citta, NPPD Larry Linder, NPPD



United States Department of the Interior

FISH AND WILDLIFE SERVICE **Ecological Services** Nebraska Field Office 203 West Second Street Grand Island, Nebraska 68801

June 1, 2010

Mr. Joe L. Citta Corporate Environmental Manager Nebraska Public Power District 1414 15th Street PO Box 499 Columbus, NE 68602-0499

Dear Mr. Citta:

Please make reference to a letter from the Nebraska Public Power District (NPPD) dated May 10, 2010, which summarized discussions at a recent April 7, 2010, meeting about a proposed 115 kV transmission line construction project extending from O'Neill to Stuart, Nebraska. As you know, representatives of the NPPD, U.S. Fish and Wildlife Service, and Nebraska Game and Parks Commission previously met on several occasions during the planning phases of this project to identify and discuss potential threatened and endangered species impacts. We acknowledge and commend NPPD's commitment to continue coordination with us to address potential impacts to these species. Measures to address and/or avoid potential impacts include species surveys, habitat avoidance, and capture/relocation procedures in areas which provide suitable habitat. Implementation of agreed upon measures where suitable habitat is present along the final line route would satisfactorily address impacts to threatened and endangered species.

We appreciate the opportunity to review and comment on the proposed transmission line project and NPPD's willingness to involve the resource agencies throughout project planning. If you have any questions regarding these comments, please contact Mr. Robert Harms of this office at Robert Harms@fws.gov or telephone number (308) 382-6468, extension 17.

Sincerely,

John Cochina

John Cochnar Acting Nebraska Field Supervisor

NGPC; Lincoln, NE (Attn: Michelle Koch)

cc:


Nebraska Game and Parks Commission

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641 • Fax: 402-471-5528

June 10, 2010

Sara Hayek Nebraska Power Review Board 301 Centennial Mall South, 5th Floor Lincoln, NE 68509

Re: Application No. PRB-3627, O'Neill to Stuart, 28 miles of 115 kV transmission line, Holt County, Nebraska

Dear Ms. Hayek:

Please make reference to your letter dated May 24, 2010. This letter is in response to your request for a review of this project's potential impacts to threatened and endangered species in Holt County, Nebraska. As we understand it, the project involves constructing 28 miles of 115 kV line to provide an energy source for the TransCanada Keystone XL Pipeline Pumping Station (PS-22). We have completed our review of the proposed sites under <u>Neb. Rev. Stat.</u> § 37-807 (3) of the Nongame and Endangered Species Conservation Act and we offer the following comments.

Staff from the Nebraska Game and Parks Commission (NGPC) and the Nebraska Public Power District (NPPD) have had numerous meetings dating back to July 2009 to discuss the O'Neill to Stuart transmission line project. Staff from the U.S. Fish and Wildlife Service, Nebraska Field Office, Grand Island, was also present at those meetings. Through the course of these meetings, NPPD has narrowed the project from the initial study area to corridors to preferred and alternative routes. At each of these phases, NGPC has advised NPPD on potential impacts to threatened and endangered species as well as other species protected under federal laws, such as the Migratory Bird Treat Act and the Bald and Golden Eagle Protection Act. NPPD has incorporated this information into the routing process to try to avoid impacts to threatened and endangered species and their habitats when possible.

The project corridor and preferred and alternative routes for this project are within the range of the following state listed threatened and endangered species:

American Burying Beetle (*Nicrophorus americanus*) – state and federal endangered Whooping Crane (*Grus americana*) – state and federal endangered Western Prairie Fringed Orchid (*Platanthera praeclara*) – state and federal threatened Small White Lady's Slipper (*Cypripedium candidum*) – state threatened River Otter (*Lutra canadensis*) – state threatened

Through the aforementioned discussions, NPPD has agreed to determine if suitable habitat for each of these species is present within the area that will be impacted by construction activities. If suitable habitat is present, then NPPD will conduct additional surveys to determine if these species are present. In the event one or more of these species are present, then NGPC and NPPD will cooperatively develop conservation measures to address potential impacts.

Since NPPD has taken the appropriate steps through the consultation process to avoid adverse impacts to threatened and endangered species, we have no objection to the selected corridor or the routes within the corridor. Additionally, NPPD has committed to continued coordination with our agency as the final route is



constructed. They have agreed to mark certain portions of the line with bird diverters if necessary and to conduct appropriate surveys for the threatened and endangered species listed above.

Therefore, we have determined this project "may affect but is not likely to adversely affect" state-listed threatened or endangered species. We made this determination based on discussions and meetings with NPPD, the continued commitment to coordinate with our agency, a review of the material you sent, aerial photographs, topographic maps and our Nebraska Natural Heritage Database.

Based upon the submitted information, we have no objection to the proposal as currently planned. If the proposed project is changed or new information regarding threatened or endangered species becomes available, then this determination is no longer valid and further consultation with the Nebraska Game and Parks Commission will be necessary.

All federally listed threatened and endangered species are also state listed. For assessment of potential impacts on federally listed, candidate or proposed threatened or endangered species, please contact John Cochnar, Nebraska Field Office, U.S. Fish and Wildlife Service, 203 W. Second St., Grand Island, NE 68801.

Thank you for the opportunity to comment. If you have any questions or need additional information, please feel free to contact me.

Sincerely,

Nichelle Phace

Michelle R. Koch Environmental Analyst Supervisor Nebraska Natural Heritage Program Nebraska Game and Parks Commission (402) 471-5438, michelle.koch@nebraska.gov

CC: John Cochnar, USFWS Robert Harms, USFWS Joe Citta, NPPD Larry Linder, NPPD



OCT 2010

October 14, 2010

I'S. FISH & WIDLIFE SFRMICT

U.S. Fish and Wildlife Service Attn: Scott Larson, Field Supervisor 420 South Garfield, Suite 400 Pierre, SD 57501-5408

RE: Grand Electric Cooperative, Inc. PS15, PS16 and PS17 TransCanada Facilities Construction Work Plan (CWP) and Borrower's Environmental Report (BER)

Dear Mr. Larson:

Electrical Consultants, Inc. (ECI) is currently assisting Grand Electric Cooperative, Inc. (GEC) with their Construction Work Plan (CWP) and Borrower's Environmental Report (BER) for the PS15, PS16 and PS17 TransCanada Facilities proposed projects located in Harding, Perkins and Meade County, South Dakota. Both the CWP and BER are documents required and requested by the USDA Rural Utilities Service/RUS for funding purposes. As part of this process, we are in need of your agencies comments and/or recommendations with regards to any mitigation measures concerning the identified work.

To better assist you in your review, I've enclosed a GEC CWP Improvements List and other pertinent map(s) showing potential resources of concern with GEC's Service Areas for each of the CWP Substation Service Areas and the projects proposed within each area.

If possible, we would appreciate your comments concerning the proposed construction within thirty (30) days or no later than November 9, 2010. If I've not contacted the correct individual for this request, please inform me so I may forward this information onto that person or department.

If you have no comments, please mail, fax or email a letter stating "no comments". If you have any questions or need additional information, please contact me at (406) 259-9933.

Sincere

Linda Lee Assistant Environmental Planner

Enc.

CWP	Improvement Descriptions	
Code	Thip ovement Descriptions	
	GEC'S PROPOSED PUMP STATION 15 (PS15)	
217*	This project consists of building 1.9 miles of single phase 14.4 kV, #2 ACSR overhead distribution line. This new build project starts at the proposed new PS15 Substation, (see proposed CWP Project #401 below) which location is planned for design in north east corner of Section 21, this project then travels east for approximately 1.10 miles then heads north for approximately 0.8 miles crossing the Wagoneer Creek. This project is located in Sections 16 and 15 in Harding County, SD	
329*	This project consists of rebuilding 3.0 miles of 3 phase 24.9 kV, #4/0 ACSR overhead distribution line with 3 phase #4/0 underground (URD) distribution line. This rebuild starts at the existing transmission line at MP 0 and travels west along County Highway 797 for approximately 2.0 miles then heads directly north for 1.0 mile between Section 1 and Section 6 in Harding County, SD.	
401*	This project consists of building a new 115-69 kV PS15 Substation. This new PS15 Substation will be located in the north east corner of Section 21 of Harding County, SD.	
520*	This project consists of the addition of a 115 kV bus as well as a 115-69 kV transformer to the existing BRRU Switchyard. This project will not require additional expansion so no additional land will be utilized. The existing BRRU Switchyard is located in Section 16 in Harding County, SD.	
806*	This project consists of building approximately 24.1 miles of new 115 kV, 556.5 kCM ACSR overhead transmission line. This project starts at the existing BRRU Switchyard in Section 16 of Harding County, SD and traverses north and west for approximately 19.0 miles when the route heads south for approximately 1.0 miles, turns and heads directly west for an additional 4.1 miles entering into the proposed PS15 Substation.	
809*	This project consists of rebuilding 1.25 miles of 115 kV overhead transmission line with 795 kCM ACSR. This proposed project would start at the existing BRRU Switchyard and would travel and tie into the existing Ladner Substation. This project starts in Section 16, travels directly north crossing into Section 9 of Harding County, SD for approximately 1.25 miles.	
	GEC'S PROPOSED PUMP STATION 16 (PS16)	
218*	This project consists of building 5.5 miles of single phase 14.4 kV, #2 ACSR overhead distribution line. This project starts at the proposed new substation currently planned to be placed in Section 25 in Harding County, SD. The project route will leave the proposed PS16 substation and travels north for approximately 0.3 miles then heads directly west along JB Road for an additional 5.2 miles.	
330*	This project consists of rebuilding 2.5 miles of three phase 24.9 kV, #4/0 ACSR overhead distribution line with 3 phase #1/0 underground distribution line (URD). This project starts approximately 3.5 miles south west of Reva, SD and travels along State Highway 20 for 2.5 miles in Harding County, SD	
331*	This project consists of rebuilding 0.5 miles of three phase 24.9 kV, #1/0 ACSR overhead distribution line with 3 phase #1/0 underground distribution line (URD). The project starts approximately ½ mile east of 155 th Avenue and travels along State Hwy 20 for 0.5 miles. This project is located in Perkins County, SD.	
402*	This project consists of building a new 115-69 kV PS16 Substation. This new substation is would be located in the north west corner of Section 25 in Perkins County, SD and approximately 0.3 miles south of JB Road.	
522*	This project consists of expanding the 230 kV bus at the existing John Riedy Substation. The existing John Riedy Substation is located in north west corner of Section 16 in Perkins County, SD or approximately 7.0 miles east of Prairie City, SD. The expansion of this substation results in an increase of acreage of .52 acres of farmland of statewide importance.	
807*	This project consists of building 41.25 miles of 115 kV overhead transmission line. The line starts just east of 168th Avenue at the existing John Reidy Substation in Perkins County, SD and travels directly west for approximately 33.0 miles, then heads south southwest for the remaining 8.25 miles ending at the proposed new PS16 Substation.	
	GEC'S PROPOSED PUMP STATION 17 (PS17)	
219*	This project consists of building 0.2 miles of single phase 14.4 kV, #2 ACSR overhead distribution line. This proposed project route starts just outside the proposed Pump Station 17 (PS17) which is proposed to be located just north of Opal Road in Mead County, SD.	
406*	This project consists of building a new 115-6.9 kV substation. This proposed project will be located in the south west corner of Section 22 in Meade County, SD.	
808*	This project consists of building 10.8 miles of 115 kV, 556.5 kCM ACSR overhead transmission line. This project route starts at the existing Maurine Substation then turns and heads south along Maurine Road for 3.0 miles, then travels east for 1.0 mile, turning south again for 3.0 miles, heads east for 2.0 miles then angles south east for 0.3 miles then turns and heads directly south for 1.8 miles entering into the proposed PS17 Substation. This complete project route is located in Meade County, SD.	

RUS Project Coding Guidelines for Construction Work Plans (CWP) Legend			
CWP	CWP PROJECT CODE DESCRIPTION		
CODE			
200*	Build New Tie Lines - Designates construction of new line for the purpose of connecting two or more existing circuits or substation bus		
300*	0* Rebuild Conversion and Line Changes – Designates any conversion or line change of an existing primary circuit required to improve the		
	quality or quantity of service to more than one existing consumer		
400*	Build a new Substation, Switching Stations or Metering Point		
500*	Changes to an existing Substation, Switching Station or Metering Point Changes		
800*	Build new Transmission Lines (both sub-transmission and bulk transmission projects)		



December 18, 2012

Mr. John Cochnar		
Acting Field Supervisor		
US Fish and Wildlife Service	· · · · ·	
203 West Second Street		
Grand Island, NE 68801		

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Big Flat Electric Co-op., Inc., a power provider located in Malta, Montana, is providing electric service to Pump Station #9 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

eanne Bornard

Jeanne Barnard Manager Big Flat Electric Co-op., Inc.



United States Department of the Interior Fish and Wildlife Service



Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 Phone: (406) 449-5225 Fax: (406) 449-5339

February 19, 2013

Ms. Jeanne Barnard Big Flat Electric Cooperative P.O. Box 229 Malta, MT 59538

Dear Ms. Barnard:

This letter responds to your December 18, 2012 letter, received in our office on January 8, 2013, and your request for U.S. Fish and Wildlife Service (Service) comments on Big Flat Electric Cooperative's (Big Flat) proposed electric service line in connection with the proposed Keystone XL pipeline project Pump Site #9 through Phillips County, Montana. Your letter included proposed route maps; information regarding the proposed line configuration, etc. was not provided. Our response comments are authorized under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703 et seq.), as amended, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), as amended, and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

We understand that the approximate 62 mile-long 115 kV line is proposed to provide power to Keystone XL's proposed Pump Site #9 in Phillips County. The proposed line would extend between the proposed Pump Site #9, which occurs northeast of Malta approximately 1 mile south of the Canadian border, and a point south of Bowdoin National Wildlife refuge, approximately 11 miles south of U.S. Highway 2. The line would cross the Milk River approximately 3 miles east of Nelson Reservoir.

Our comments and recommendations regarding listed and candidate threatened and endangered species are provided below. Additional recommendations pertaining to eagles and other migratory birds are provided for your consideration in subsequent sections.

Threatened and Endangered Species

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs (DOS) completed a Biological Assessment (BA) for the proposed Keystone XL Project on December 21, 2012. General threatened and endangered species conservation measures that could be applied to power line projects proposed in conjunction with the Keystone XL Project were included in the BA. However, determinations as to which specific conservation measures would be applied to which

specific proposed power lines were not provided in the BA; such determinations were left to further consultation between Service Ecological Services Field Offices and proposed power providers in each affected state. Your December 18, 2012 letter stated that Big Flat will consult with this office on mitigation and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in specific areas along the proposed power line corridor. Although not specified in your letter, the listed endangered black-footed ferret (included in the BA) should also be included in this consultation. We further recommend that your consultation include the candidate greater sage-grouse and Sprague's pipit, which were also included in the BA.

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed and candidate species and designated critical habitat may occur in the general proposed Pump Site #10 power line project region:

Scientific Name	Common Name	Status	Montana Range/Habitat
Mustela nigripes	Black-footed Ferret	LE	Prairie dog complexes; eastern Montana
Charadrius melodus	Piping Plover	LT	Missouri River sandbars, alkali wetlands/beaches, Fort Peck Lake; northeastern Montana
		СН	Alkali lakes in Sheridan County; riverine and reservoir shoreline in Garfield, McCone, Phillips, Richland, Roosevelt and Valley counties
Grus americana	Whooping Crane	LE	Wetlands; migrant eastern Montana
Centrocercus urophasianus	Greater Sage- Grouse	C	Eastern, central, and southwestern Montana in sagebrush, sagebrush- grasslands, and associated agricultural lands
Anthus spragueii	Sprague's Pipit	С	Grassland habitats with little or no shrub cover east of the Continental Divide

*LE = Listed Endangered; LT = Listed Threatened; CH = Critical Habitat; C = Candidate Species

Most of the above species have been documented in the general project area. Based on the BA, we understand that no prairie dog towns would be traversed by the proposed route. Consequently, we anticipate no adverse effects to black-footed ferrets as a result of the proposed project. Whooping cranes may occur as rare spring and fall migrants, using suitable stopover habitat in the area. Whooping cranes have been reported in the project vicinity in wetland areas north of U.S. Highway 2 as recently as 2005. Piping plovers are known to nest at Nelson Reservoir and Bowdoin National Wildlife Refuge; the closest documented breeding record occurs along the northeast shore of Nelson Reservoir over 3 miles west of the power line route. A transitory piping plover was observed 2 miles north of the route at the south end of Whitewater Lake in 2005. Direct and indirect Sprague's pipit breeding evidence has been recorded at numerous grassland locations in the immediate project area by the Montana Natural

Heritage Program (MNHP); particularly north of Whitewater. Optimal, moderate, and low potential Sprague's pipit habitat suitability classes, as mapped by the MNHP, appear to be traversed by the proposed route. Greater sage-grouse also occur in the project area; including leks and general habitat. Based on your maps, it appears that the project would not traverse mapped core habitat. According to Appendix N of the BA, greater sage-grouse leks 588 (SG11-29), 1853 (SG11-88), 595 (SG 11-71), 594 (SG 11-73), 593 (SG 11-72), 570 (SG 11-78) occur within 3 miles of the proposed transmission line route. As shown on your project maps, an additional recently discovered lek occurs east of lek 593. Leks 1853 (1 mile), 593 (0.16 mile), unnamed lek east of 593 (0.5 mile), and 520 (0.9 mile) are closest to the proposed alignment. Based on 2010-2012 surveys and other agency data, Appendix N of the BA concludes that all of these leks are active.

Designated piping plover critical habitat occurs in the general proposed project area at the Bowdoin National Wildlife Refuge (see http://www.fws.gov/mountain-prairie/species/birds/pipingplover /fedreg091102.pdf for piping plover critical habitat locations), but would not be traversed by the proposed transmission line route.

Candidate species are those placed on the candidate list for future action, meaning those species do not receive statutory protection under the ESA. Candidates are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Federal agencies and non-federal applicants can conference with the Service pursuant to section 7(a)(4) of ESA to ensure that their actions do not negatively impact candidate species. Some federal agencies provide the same level of protection to candidate species as proposed or listed species and take appropriate measures to avoid impacts. Candidate species are included in the BA, and it is our understanding that the DOS intends to enact this level of protection relative to the Keystone XL project, including ancillary facilities such as this proposed power line.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the federal agency or its designated agent determines the action "may affect, is likely to adversely affect" listed species or critical habitat, the responsible federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "may affect, not likely to adversely affect" determination, concurrence from this office is required. If the evaluation shows a "no effect" determination for listed species or critical habitat, further consultation is not necessary. If a private entity receives federal funding for a construction project, or if any federal permit or license is required, the federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species or designated critical habitat.

As stated above, the proposed Pump Site #9 power line project is included in the ESA section 7 consultation (as documented the BA) underway relative to the overall proposed Keystone XL pipeline project. As such, we expect that all applicable conservation measures identified in the final BA will be implemented relative to this proposed power line project. The following conservation measures are included in the BA and are applicable and recommended relative to this proposed power line project.

Repetitive measures (per the BA) are only listed once. Recommended additions or revisions to these measures pertaining to this power line project, as well as other comments, are indicated in italics:

Black-footed Ferret:

- Workers would not be allowed to keep domestic pets in construction camps and/or worksites.
- Workers would be made aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas).
- Workers would not be allowed to feed wildlife.
- Concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) would be reported to the appropriate state and federal agencies.

Whooping Crane:

 Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat at the discretion of the local Ecological Services Field Office, based on the biological needs of the whooping crane. Marking is recommended within 0.25 mile of the Milk River and all other open water or emergent wetland areas traversed by the route. We recommend line marking in compliance with the Avian Power Line Interaction Committee's (APLIC) <u>Reducing Avian Collisions with Powerlines, The State of the Art in 2012</u>.

We also recommend the following measure:

 During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, Big Flat would immediately contact the Service and Montana Fish, Wildlife and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area.

Piping Plover: (the first seven measures would also facilitate potential impact avoidance and minimization relative to the whooping crane):

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible.
- · Equipment would not be washed in streams or wetlands.
- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- Keystone would mark and maintain a 100-foot area from these river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers.
- Distribution lines supplying power to pump stations should be marked with bird diverters

deflectors where within 0.25 mile of the Milk River and all other open water or emergent wetland areas traversed by the route they cross rivers and within 0.25 mile of each side and between rivers and sand and gravel mining areas to reduce potential injury or mortality to piping plovers. We recommend marking in compliance with APLIC's <u>Reducing Avian Collisions</u> with Powerlines, The State of the Art in 2012.

- Reroute power lines to avoid construction within 0.5 mile of piping plover nesting areas in alkali wetlands in Montana. We are currently not aware of such nesting areas within 0.5 mile of the proposed route. If such nests are determined to be present, we recommend implementation of this measure.
- Mark new power lines with bird flight diverters (preferably Swan Spiral diverters or Firefly diverters) within 0.25 mile of piping plover nesting sites on river systems and commercial sandpit areas. See recommendations under the eighth Piping Plover bullet above for recommended line marking locations.
- If power line construction occurs during the piping plover nesting season(May 1 through August 15), survey potential riverine or sand pit piping plover nesting areas within 0.25 mile of new power lines and within 2 weeks of (prior to) construction to determine presence of nesting piping plovers. If nesting piping plovers are present, construction would cease until all piping plover chicks fledge from the site. This measure should be applied in suitable wetland habitats within 0.25 mile of the proposed route.

Greater Sage-Grouse: The BA includes conservation measures that apply to Keystone project features in Montana. However, it is unclear in the BA as to which measures may apply to proposed pump station power line routes. Similar measures are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 Montana Department of Environmental Quality (MDEQ) Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities.

We recommend that, at a minimum, the following conservation measures be implemented relative to greater sage-grouse. Some are modifications to measures in the BA, some are modifications to measures in the Environmental Specifications, and some are unique to this letter. Big Flat should inform the Service as to any additional potential conservation measures listed in the BA that it intends to enact, including any elements of the sage-grouse mitigation plan in the BA Appendix O.

- The Service generally recommends that transmission lines not be sited within four miles of leks. Where this is not feasible, power lines should be sited to avoid and minimize encroachment on greater sage-grouse leks and important habitats to the extent possible on a case-by-case basis. As feasible, facilities should: 1) be topographically screened from leks, and; 2) be buried where proposed within sight of leks or traversing important habitats.
- Prior to the start of construction, surveys should be conducted to determine the locations and activity of greater sage-grouse leks within three miles of the facility. Survey methods should be approved by the Service, MFWP and Bureau of Land Management (BLM). Results of the surveys should be presented to the Service, MFWP and BLM.
- Incorporating the provisions in BA Appendix O and the MDEQ Environmental Stipulations, construction should be prohibited from March 1 to June 15: 1) within three miles of active greater sage-grouse leks: a) not screened by topography, or b) within suitable nesting habitat

regardless of screening; and 2) within no closer than one mile of any active lek, with the following exceptions:

a. Equipment may pass as a single group along the permitted right-of-way or approved location though a restricted lek buffer area.

b. Equipment should only pass through a restricted lek buffer between 10:00 am and 2:00 pm, to avoid disturbing displaying birds during critical times of the day. c. If major grading is required to pass equipment along the permitted right-of-way or

approved location, this grading should take place outside of the March 1 through June 15 restriction period.

d. As the equipment passes through the areas, if any large hummocks or rocks impede the travel lane, the lead dozer will lower its blade on the way through to move the obstruction to the side and/or smooth out any larger hummocks or rocks.

- Monitor active leks (displaying males) within 3 miles of the project during any construction between March 1 and June 15; suspend construction until June 16 if construction-related disturbance is noted.
- Pole and span configurations should be designed to maximize distances between poles and leks.
- Big Flat should contact BLM, MFWP, and the Service to determine what mitigation measures are needed for a (currently unknown) lek found within the proposed construction ROW and implement those measures.
- Big Flat should implement reclamation measures (e.g., application of mulch or compaction of soil after broadcast seeding, and reduced seeding rates for non-native grasses and forbs) that favor the establishment of silver sagebrush and big sagebrush in disturbed areas, where compatible with the surrounding land use and habitats, unless otherwise requested by the affected landowner.
- Unless requested by the affected landowner, Big Flat should use locally adapted sagebrush seed, collected within 100 miles of the areas to be reclaimed, in any sagebrush reclamation.
- Big Flat should implement measures to reduce or eliminate colonization of reclaimed areas by noxious weeds and invasive annual grasses such as cheatgrass, to the extent that these species do not exist in undisturbed areas adjacent to the right-of-way.
- Big Flat should comply with all additional measures stipulated by BLM in conjunction with future
 easement or other authorizations associated with this project in compliance with BLM
 Instruction Memorandum No. 2012-043, Greater Sage-Grouse Interim Management Policies and
 Procedures. Such measures may include more restrictive site-specific buffers and timing
 restrictions, line marking, and perch inhibitor installation.

Sprague's Pipit:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.
- Control unauthorized off-road vehicle access to the construction ROW through the use of Signs, fences with locking gates, slash and timber barriers, pipe barriers, boulders lined across the construction ROW; or plant conifers or other appropriate trees or shrubs in accordance with landowner or manager request where such plantings would not diminish the quality of adjacent Sprague's pipit habitat.
- If construction would occur during the April 15 to July 15 grassland ground-nesting bird nesting season, pre-construction nest-drag surveys should be completed to determine the presence or absence of nests where the proposed line traverses native prairie on federal land in

eastern Montana. Alternatively, construction could be completed outside of the nesting season in native prairie habitats.

 Delay construction activity until young have fledged from April 15 to July 15 within 330 feet of discovered active Sprague's pipit nests in eastern Montana.

We also recommend the following measure:

 The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible; particularly optimal and moderate potential Sprague's pipit habitat suitability classes as mapped by the MNHP (available electronically from MNHP). Where feasible, facilities should be buried where traversing such habitats is unavoidable.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction of transmission lines and appurtenant infrastructure and access, even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans, avian protection plans (APPs), and bird conservation plans, and to implement those measures prior to/during construction.

Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions has, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

To minimize the electrocution and collision hazards to birds, we generally recommend that new power lines be buried where feasible. Where this is not feasible, we recommend that any proposed newly constructed or modified overhead power lines or substations be designed and built to the APLIC standards in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.* To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, daytime visual markers should be installed on proposed lines within 0.25 mile of the Milk River and all other open water or emergent wetland areas traversed by the route, and all other areas as recommended during your coordination with MFWP and BLM per techniques outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 2012.*

To the maximum extent practicable, project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season. We recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species. If work is proposed to take place during the breeding season or at any other time which may result in take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent take all practicable measures to avoid and minimize take, such as maintaining adequate buffers, to protect the birds until the young have fledged. Active nests may not be removed. The Service further recommends that if field surveys for nesting birds are conducted with the intent of avoiding take during construction, any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be maintained.

Certain activities may require a permit from the Service's Migratory Bird Management Division. Please contact the Region 6 Migratory Bird Permits Office if you are uncertain if activities may result in take of migratory birds, eggs, or nests. Additional information about permits can be found at http://www.fws.gov/migratorybirds/mbpermits.html. Service guidance regarding bird nest destruction can be found at http://www.fws.gov/policy/m0208.pdf.

Bald and Golden Eagles

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A permit is required for any legal take of bald or golden eagles or their nests (whether occupied or unoccupied). Limited issuance of permits to take bald and golden eagles can be authorized "for the protection of . . .other interests in any particular locality" where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided. No one is required to seek a permit for any activity. However, where an activity results in take, it is a violation of BGEPA unless a permit authorizing that take has been obtained prior to the action.

Both bald and golden eagles occur throughout the general project area year round. Both species have been known to congregate during winter in the general Milk River and Nelson Reservoir areas.

Suspected golden eagle nesting was reported in 2011 west of Whitewater Lake approximately 3 to 5 miles northwest of the proposed line route, and other historically reported golden eagle nests occur in the general area. Based on 2013 Montana Natural Heritage Program data, we are not aware of bald or golden eagle nests within a mile of the proposed route. However, as-yet undetected nests may be present and we recommend a survey for eagle and other raptor nests be conducted within a mile of the proposed line prior to construction. Bald eagle nests are most commonly distributed in trees around the periphery of lakes and large reservoirs, and linearly along forested corridors of major rivers such as the Milk River, usually within 1 mile of shore. Golden eagles generally nest on cliffs or trees; usually in open or semi-open habitat.

During the nesting season, especially early in the season, eagles can be very sensitive to disturbance near the nest site and may abandon the nest as a result of low-level disturbance, even from foot traffic. Where construction is proposed in proximity to a bald eagle nest, concentrated foraging area, or communal roost site, we recommend that at a minimum, Big Flat comply with siting recommendations, seasonal restrictions, and distance buffers specified in the 2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994). A nest buffer of at least 0.5 mile should be maintained for bald eagles. The Service's May 2007, National Bald Eagle Management Guidelines contains additional information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/ Migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.p df.

The Service has not issued golden eagle management guidelines. However, appropriate buffers for nests and other important use areas based on site-specific conditions should be developed in conjunction with this office if project activities are proposed in proximity to such areas. In Montana, the Service generally recommends avoidance of occupied nest site disturbance between January 1 and August 15. Depending on site-specific conditions, the typically recommended 0.5-mile buffer distance for bald eagle important use areas may be inadequate to ensure avoidance of golden eagle disturbance; larger buffers may be warranted. We therefore recommend avoidance of occupied golden eagle territories where practicable; maximizing distances between nests (including alternate nests) and the siting of proposed project features; avoidance of occupied nest site disturbance during the nesting season; and avoidance / minimization of impacts to important golden eagle habitat (e.g., shrub-steppe and native grasslands) within golden eagle territories.

Whether or not an active bald or golden eagle nest is present, we again recommend implementation of measures to address potential avian electrocution or collision along portions of the route, as discussed above, due to eagle and other potential migratory bird activity in the area.

Other Comments

We strongly recommend continued coordination with MFWP, BLM, and the MNHP. These agencies may be able to provide updated, site-specific information regarding threatened, endangered, and sensitive species; eagle and other raptor nest locations; and other fish and wildlife resources occurring in the proposed project area.

Construction timing and distance buffers for sharp-tailed grouse and several other wildlife species are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. We recommend that Big Flat adhere to these construction timing and distance buffers where applicable and possible.

Sensitive resources that should be considered in final siting of all project facilities include threatened, endangered, and candidate species and their habitat, bald and golden eagle and other migratory bird species nesting and habitat; wetlands; ephemeral, intermittent and permanent streams; naturally wooded draws; sagebrush habitat; and native prairie. Additional general recommendations include:

- No in-stream work should be conducted in the Milk River.
- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels;
- Enact best management practices to avoid and minimize the spread of noxious weeds and other undesirable exotic plant species within the proposed project area;
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.

In conjunction with ESA section 7 consultation process, we request that Big Flat provide the Service a written response regarding Big Flat's intent to apply our recommended conservation measures for listed and candidate threatened and endangered species as provided above under **Threatened and Endangered Species**. Also, as stated above, Big Flat should inform the Service in writing as to any additional potential conservation measures listed in the BA that it intends to enact, including any elements of the sage-grouse mitigation plan in the BA Appendix O. We would also appreciate notification as to what recommendations provided above under **Migratory Birds** and **Bald and Golden Eagles** Big Flat intends to implement.

Thank you for the opportunity to review and comment on this proposed project. Please telephone Jeff Berglund at 406/449-5225, ext. 206, if you have any questions regarding this matter.

Sincerely,

Brent Esmoil Acting Field Supervisor



February 25, 2013

U.S Department of Interior Fish and Wildlife Service Ecological Services 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 RECEIVED BY

FEB 27 2013

FWS ES FIELD OFFICE

Attention: Jeff Berglund

RE: Comments and recommendations regarding listed and candidate threatened, and endangered species concerning the building of a 115KV transmission line to serve Keystone XL.

Dear Jeff:

In regards to your letter dated February 19, 2013 I offer my formal response on behalf of Big Flat Electric Cooperative.

Threatened and Endangered Species:

The following endangered species have been identified in the Biological Assessment (BA).

Mustela nigripes	Black-footed Ferret
Charadrius melodus	Piping Plover
Grus Americana	Whooping Crane
Centrocercus	Greater Sage
Uraphasianus	Grouse
Anthus spragueii	Sprague's Pipit

As previously stated in Big Flat Electric's letter dated December 18, 2012, Big Flat Electric will consult with your office on mitigation and protective measures that can be incorporated into the design of the power line facilities.

Mustela nigripes Black-footed Ferret:

There are no prairie dog towns that would be traversed by the proposed route. Please refer to Appendix C which shows the route for the 115 KV transmission line. Consequently, there are no effects to the black-footed ferret.

Charadrius melodus Piping Plover:

Big Flat Electric designed and located our transmission line to mitigate sensitive areas to the above species. We moved the line to the east to specifically avoid <u>Charadrius melodus</u> (<u>Piping plover</u>). The U.S. Fish & Wildlife Service Comprehensive Conservation Plan for the <u>Bowdoin National Wildlife Refuge Complex</u> was the blue print we used. According to the map provided (Appendix A) in this report, Big Flat Electric's transmission line is located 3 miles east of any Piping Plover nesting or habitat areas.

Grus Americana Whooping Crane:

While there may be a rare migrant, there have been no sightings of any Whooping Cranes in the general area of our transmission line since 2005. Big Flat Electric recognizes that as rare as this occurrence may be, Big Flat intends to use markers and deflectors within 0.25 miles of the Milk River that will be traversed by our line. We will also consult with your office on any other mitigating measures we can make. We already have on file <u>The State of the Art in</u> <u>2012: Reducing Avian Collisions with Power Lines</u>, (Appendix B) and attended the workshop by the EEI Institute. Immediate consultation will occur with your office if a Whooping Crane is spotted at any time, especially during migration season: April through May or September through October.

Anthus spragueil Sprague's Pipit;

Sprague's Pipit breeding evidence has been recorded at numerous grassland locations in the project area by the Montana Natural Heritage Program north of Whitewater. The area is broad in scope and may be traversed by the line. In consultation with your office, all mitigating measures would be taken to avoid disturbance during breeding and nesting periods.

Centrocercus urophasianus Greater Sage Grouse:

The Greater Sage Grouse, while not an endangered species, is listed as Candidate and respected as such. Big Flat Electric has identified four areas of sensitivity. Two of those areas are located over 1 mile west of the transmission line. Two of those areas are located within 1 mile of the transmission line. (See map in Appendix C).

To mitigate any adverse effects, Big Flat Electric has taken the following steps.

 Line Superintendent Darren Demarais has taken an Avian Interactions Workshop from the Edison Electric Institute to better understand how to build and construct power lines in sensitive habitat areas such as the Greater Sage Grouse. On file at our office is the literature for Suggested Practices for Avian Protection on Power Lines. (Appendix B).

2. Consult with local BLM Area Office for specific sites to be avoided.

Addressing Recommendations:

Black Footed Ferret: Does not apply to the area habitat of transmission line. Immediate notification of any sighting will be reported at once to your office.

Whooping Crane: Adopt recommendations of BA:

Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat in consultation with your office. Markings addressed above under Whooping Crane.

Piping Plover: Adopt following measures (Also applies to Whooping Crane):

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from water bodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetlands, if possible.
- Equipment would not be washed in streams or wetlands.
- Construction and restoration activities would be conducted to allow for prompt and
 effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks introduced supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- If nesting plovers are present, construction would cease until all Piping plover chicks fledge from the site.

Greater Sage-Grouse:

- To avoid and minimize any encroachments on any Sage-Grouse leks to the extent possible.
- Consult prior to construction survey conducted to determine the locations and activity of greater sage-grouse leks within three miles of the facility.
- Incorporating the provisions in BA Appendix O and the MDEQ Environmental Stipulations, construction should be prohibited from March 1 to June 15th.
- Big Flat Electric will contact BLM, MFWP to determine what mitigation measures are needed.
- Big Flat Electric has already secured a contractor to implement reclamation measures that favor the establishment of silver sagebrush (big sagebrush is not located north of the Milk) and other habitat species designed for sage grouse habitat.
- Areas of reclamation will be done by an established contractor in the area using only BLM approved seeds.

Sprague's Pipit:

 Big Flat Electric has already secured a contractor to seed disturbance areas in native range with a BLM approved native seed mix.

- · Restrict unauthorized off-road vehicle access to construction ROW
- · Pre-construction surveys should be coordinated with your office.

Migratory Birds:

All new power lines and substations will comply with the recommendations in standards in <u>Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.</u> And <u>Mitigating Bird Collisions with Power Lines: The State of the Art ion 2012</u> (Appendix B).

Big Flat Electric insures compliance with MFWP, BLM and the MNHP and appreciates the guidance in the construction of our power line to serve Keystone XL. Big Flat Electric respects the sensitive species and habitat occurring in the proposed project area and will take all measures to avoid and mitigate any negative impacts.

Construction timing and distance as outlined above will be strictly enforced as well as application of the above recommendations.

Please contact me with any questions you may have at 406-654-2040.

Respectfully Submitted,

Stanki

Jeanne Barnard, Manager

Enclosed for your review are the following appendixes:

Enclosed:

Appendix A: Habitat Map – Piping Plover Appendix B: Course's attended and books Appendix C: Map identifying sensitive sage grouse areas



P.O. Box 951 Glasgow, MT 59230 Phone (406) 228-9351 Fax (406) 367-9306 P.O. Box 287 Opheim, MT 59250 Phone (406) 762-3411 Fax (406) 762-3352

December 18, 2012

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

NorVal Electric Cooperative, Inc., a power provider located in Glasgow, MT, is providing electric service to Pump Stations 10 and 11 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

Craig Herbert General Manager NorVal Electric Cooperative, Inc



POINT OF INTERCONNECTION AND COOPERATIVE INTERCONNECTION FACILITIES

Point of Interconnection:

The Point of Interconnection between the NorVal and TransCanada Electrical Facilities at Pump Station #10 shall be at the 115/6.9 kilovolt substation, herein referred to as the Black Coulee Substation. An air break switch (ABS) on the 6.9 kV bus shall be established as the demark point between the two entities.

NorVal shall construct 51.0 miles of 115 kilovolt transmission line from the Fort Peck substation to the pump location (PS #10) located in Section 01, Township 31N, Range 37E.

The NorVal Coal Hill 230Kv / 6.9 kV substation, located at or near Customer pump station #11, and all associated substation electrical equipment required under RUS specifications and approved engineering design standards.

The NorVal 230Kv substation interconnecting the Western Area Power Administration 230 Kv line from Fort Peck to Glendive Montana. This shall be near the Customer's pump station #11 located in Township 25 North, Range 42 East, Section 01.



United States Department of the Interior Fish and Wildlife Service



Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 Phone: (406) 449-5225 Fax: (406) 449-5339

February 19, 2013

Craig Herbert NorVal Electric Cooperative P.O. Box 951 Glasgow, MT 59230

Dear Mr. Herbert:

This letter responds to your December 18, 2012 letter, received in our office on January 8, 2013, and your request for U.S. Fish and Wildlife Service (Service) comments on NorVal Electric Cooperative's proposed Black Coulee power line in connection with the proposed Keystone XL pipeline project through Valley County, Montana. We also received a Black Coulee project and past correspondence synopsis (dated December 4, 2012) from Randy Fisher of Heberly and Associates. Our response comments are authorized under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703 et seq.), as amended, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), as amended, and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq*.).

We understand that the approximate 50 mile-long 115 kV line is proposed to provide power to Keystone XL's proposed Pump Site #10 in Valley County. The line would be constructed using a horizontal post insulator configuration. The proposed line would extend between the proposed Pump Site #10, which occurs approximately 23 miles northwest of Glasgow and 8 miles north of U.S. Highway 2, and the north end of Fort Peck Lake. Wetlands would be spanned, and the line would cross the Milk River east of Glasgow. Portions of the line would parallel Bear Creek Road, U.S. Highway 2, Cut Across Road, and Galpin Road.

Your December 4, 2012 synopsis also indicated that you intend to place a substation adjacent to an existing 230kV transmission line in order to provide power for Keystone XL's proposed Pump Site #11 in McCone County. Provided anti-electrocution measures are provided at the substation, we anticipate no adverse effects to wildlife trust resources to result from its construction.

Our comments and recommendations regarding listed and candidate threatened and endangered species pertaining to the Black Coulee project are provided below. Additional recommendations pertaining to eagles and other migratory birds are provided for your consideration in subsequent sections.

Threatened and Endangered Species

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs (DOS) completed a Biological Assessment (BA) for the proposed Keystone XL Project on December 21, 2012. General threatened and endangered species conservation measures that could be applied to power line projects proposed in conjunction with the Keystone XL Project were included in the BA. However, determinations as to which specific conservation measures would be applied to which specific proposed power lines were not provided in the BA; such determinations were left to further consultation between Service Ecological Services Field Offices and proposed power providers in each affected state. Your December 18, 2012 letter stated that NorVal will consult with this office on mitigation and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in specific areas along the proposed power line corridor. Although not specified in your letter, the listed endangered black-footed ferret and pallid sturgeon (included in the BA) should also be included in this consultation. We further recommend that your consultation include the candidate greater sage-grouse and Sprague's pipit, which were also included in the BA.

Scientific Name	Common Name	Status	Montana Range/Habitat	
Mustela nigripes	Black-footed Ferret	LE	Prairie dog complexes; eastern Montana	
Scaphirhynchus albus	Pallid Sturgeon	LE	Bottom dwelling; Milk, Missouri, Yellowstone rivers, Fort Peck Lake	
Charadrius melodus	Piping Plover	LT	Missouri River sandbars, alkali wetlands/beaches, Fort Peck Lake; northeastern Montana	
		СН	Alkali lakes in Sheridan County; riverine and reservoir shoreline in Garfield, McCone, Phillips, Richland, Roosevelt and Valley counties	
Sterna antillarum athalassos	Interior Least Tern	LE	Yellowstone, Missouri River sandbars, beaches, Fort Peck Lake; eastern Montana	
Grus americana	Whooping Crane	LE	Wetlands; migrant eastern Montana	
Centrocercus urophasianus	Greater Sage- Grouse	С	Eastern, central, and southwestern Montana in sagebrush, sagebrush- grasslands, and associated agricultural lands	
Anthus spragueii	Sprague's Pipit	С	Grassland habitats with little or no shrub cover east of the Continental Divide	

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed and candidate species and designated critical habitat may occur in the general proposed Black Coulee power line project region:

*LE = Listed Endangered; LT = Listed Threatened; CH = Critical Habitat; C = Candidate Species

Most of the above species have been documented in the general project area. Based on the BA, we understand that no prairie dog towns would be traversed by the proposed route. Consequently, we anticipate no adverse effects to black-footed ferrets as a result of the proposed project. The pallid sturgeon occurs in the Yellowstone and Missouri River systems, and in 2011 was documented in the Milk River approximately 36 miles upstream from the Milk / Missouri River confluence. Whooping cranes may occur as rare spring and fall migrants, using suitable stopover habitat in the area. A single adult whooping crane was reported in October 1993 in a large, shallow wetland northwest of Fort Peck Lake approximately 7 miles west of the proposed transmission line route. Piping plovers are known to nest along the Missouri River and Fort Peck Lake; the closest documented breeding record occurs along the north shore of Fort Peck Lake within a mile of the south project terminus. Least terns also use these areas; the closest documented breeding record occurs along the northeast shore of Fort Peck Lake approximately 2.5 miles southeast of the south project terminus. Indirect Sprague's pipit breeding evidence has been recorded at several grassland locations in the immediate project area by the Montana Natural Heritage Program (MNHP). Optimal, moderate, and low potential Sprague's pipit habitat suitability classes, as mapped by the MNHP, appear to be traversed by the proposed route. Greater sage-grouse also occur in the project area; leks and core areas occur in the general vicinity. According to Appendix N of the BA, greater sage-grouse leks 1982 (SG20-106), 753 (SG20-060), and 1734 (SG41-014) occur within 3 miles of the proposed transmission line route. Based on inactivity observed during 2010-2012 surveys and other agency data, Appendix N of the BA concludes that leks 753 and 1734 are inactive.

Designated piping plover critical habitat occurs in the general proposed project area along the Missouri River and at Fort Peck Lake (see http://www.fws.gov/mountain-prairie/species/birds/pipingplover /fedreg091102.pdf for piping plover critical habitat locations), but would not be traversed by the proposed transmission line route.

Candidate species are those placed on the candidate list for future action, meaning those species do not receive statutory protection under the ESA. Candidates are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Federal agencies and non-federal applicants can conference with the Service pursuant to section 7(a)(4) of ESA to ensure that their actions do not negatively impact candidate species. Some federal agencies provide the same level of protection to candidate species as proposed or listed species and take appropriate measures to avoid impacts. Candidate species are included in the BA, and it is our understanding that the DOS intends to enact this level of protection relative to the Keystone XL project; including ancillary facilities such as the proposed Black Coulee power line.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible Federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the Federal agency or its designated agent determines the action "may affect, is likely to adversely affect" listed species or critical habitat, the responsible Federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "may affect, not likely to adversely affect" determination, concurrence from this office is required. If the evaluation shows a "no effect"

determination for listed species or critical habitat, further consultation is not necessary. If a private entity receives federal funding for a construction project, or if any federal permit or license is required, the federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species or designated critical habitat.

As stated above, the proposed Black Coulee power line project is included in the ESA section 7 consultation (as documented the BA) underway relative to the overall proposed Keystone XL pipeline project. As such, we expect that all applicable conservation measures identified in the final BA will be implemented relative to this proposed power line project. The following conservation measures are included in the BA and are applicable and recommended relative to this proposed power line project. Repetitive measures (per the BA) are only listed once. Recommended additions or revisions to these measures pertaining to the Black Coulee power line project, as well as other comments, are indicated in italics:

Black-footed Ferret:

- Workers would not be allowed to keep domestic pets in construction camps and/or worksites.
- Workers would be made aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas).
- Workers would not be allowed to feed wildlife.
- Concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) would be reported to the appropriate state and federal agencies.

Interior Least Tern: (the first seven measures would also facilitate potential impact avoidance and minimization relative to the piping plover, whooping crane, and pallid sturgeon):

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible.
- Equipment would not be washed in streams or wetlands.
- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- Keystone would mark and maintain a 100-foot area from these river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers.
- If construction of power lines occurs during the interior least tern nesting season (May 1 through August 15), surveys of potential riverine or sand pit interior least tern nesting areas within 0.25 mile of new power lines and within 2 weeks of (prior to) construction to determine

presence of nesting interior least terns. If nesting interior least terns are present, construction would cease until all interior least tern chicks fledge from the site. *This measure should be applied in suitable habitats within 0.25 mile of the proposed route between Fullerton Road and the south project terminus.*

 Distribution lines supplying power to Pump Station 10 23 and Pump Station 24 should be marked with bird diverters deflectors where within 0.25 mile of the Milk River, Fort Peck Lake, and all other open water or emergent wetland areas traversed by the route they cross rivers and within 0.25 mile of each side and between rivers and sand and gravel mining areas to reduce potential injury or mortality to interior least terns. We recommend line marking in compliance with the Avian Power Line Interaction Committee's (APLIC) <u>Reducing Avian Collisions with</u> <u>Powerlines, The State of the Art in 2012</u>.

Whooping Crane:

 Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat at the discretion of the local Ecological Services Field Office, based on the biological needs of the whooping crane. Marking is recommended within 0.25 mile of the Milk River, Fort Peck Lake, and all other open water or emergent wetland areas traversed by the route. We recommend marking in compliance with APLIC's <u>Reducing Avian Collisions with</u> <u>Powerlines, The State of the Art in 2012</u>.

We also recommend the following measure:

 During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, NorVal would immediately contact the Service and Montana Fish, Wildlife, and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area.

Pallid Sturgeon: We recommend implementation of the first seven measures listed above under Interior Least tern. In addition:

No in-stream work should be conducted in the Milk River.

Piping Plover:

- Distribution lines supplying power to pump stations should be marked with bird diverters
 deflectors where within 0.25 mile of the Milk River, Fort Peck Lake, and all other open water or
 emergent wetland areas traversed by the route they cross rivers and within 0.25 mile of each
 side and between rivers and sand and gravel mining areas to reduce potential injury or mortality
 to piping plovers. We recommend marking in compliance with APLIC's <u>Reducing Avian Collisions
 with Powerlines, The State of the Art in 2012</u>.
- Reroute power lines to avoid construction within 0.50 mile of piping plover nesting areas in
 alkali wetlands in Montana. We are currently not aware of such nesting areas within 0.5 mile of
 the proposed route. If such nests are determined to be present, we recommend implementation
 of this measure.
- If power line construction occurs during the piping plover nesting season(May 1 through August 15), survey potential riverine or sand pit piping plover nesting areas within 0.25 mile of new power lines and within 2 weeks of (prior to) construction to determine presence of nesting

piping plovers. If nesting piping plovers are present, construction would cease until all piping plover chicks fledge from the site. *This measure should be applied in suitable habitats within 0.25 mile of the proposed route between Fullerton Road and the south project terminus*.

Greater Sage-Grouse: The BA includes conservation measures that apply to Keystone project features in Montana. However, it is unclear in the BA as to which measures may apply to proposed pump station power line routes. Similar measures are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 Montana Department of Environmental Quality (MDEQ) Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities.

We recommend that, at a minimum, the following conservation measures be implemented relative to greater sage-grouse. Some are modifications to measures in the BA, some are modifications to measures in the Environmental Specifications, and some are unique to this letter. NorVal should inform the Service as to any additional potential conservation measures listed in the BA that it intends to enact, including elements of the sage-grouse mitigation plan in the BA Appendix O.

- The Service generally recommends that transmission lines not be sited within four miles of leks. Where this is not feasible, power lines should be sited to avoid and minimize encroachment on greater sage-grouse leks and important habitats to the extent possible on a case-by-case basis. As feasible, facilities should: 1) be topographically screened from leks, and; 2) be buried where proposed within sight of leks or traversing important habitats.
- Consistent with the provisions in BA Appendix O, compensation at \$600 per acre should be provided for power line impacts to core greater sage-grouse habitat not already accounted for in conjunction with proposed pipeline and Pump Site #10 construction.
- Prior to the start of construction, surveys should be conducted to determine the locations and activity of greater sage-grouse leks within three miles of the facility. Survey methods should be approved by the Service, MFWP and Bureau of Land Management (BLM). Results of the surveys should be presented to the Service, MFWP and BLM.
- Incorporating the provisions in BA Appendix O and the MDEQ Environmental Stipulations, construction should be prohibited from March 1 to June 15: 1) within three miles of active greater sage-grouse leks: a) not screened by topography, or b) within suitable nesting habitat regardless of screening; and 2) within no closer than one mile of any active lek, with the following exceptions:

a. Equipment may pass as a single group along the permitted right-of-way or approved location though a restricted lek buffer area.

b. Equipment should only pass through a restricted lek buffer between 10:00 am and 2:00 pm, to avoid disturbing displaying birds during critical times of the day.

c. If major grading is required to pass equipment along the permitted right-of-way or approved location, this grading should take place outside of the March 1 through June 15 restriction period.

d. As the equipment passes through the areas, if any large hummocks or rocks impede the travel lane, the lead dozer will lower its blade on the way through to move the obstruction to the side and/or smooth out any larger hummocks or rocks.

Monitor active leks (displaying males) within three miles of the project during any construction

between March 1 and June 15; suspend construction until June 16 if construction-related disturbance is noted.

- Pole and span configurations should be designed to maximize distances between poles and leks.
- NorVal should contact BLM, MFWP, and the Service to determine what mitigation measures are needed for a (currently unknown) lek found within the proposed construction ROW and implement those measures.
- NorVal should implement reclamation measures (e.g., application of mulch or compaction of soil after broadcast seeding, and reduced seeding rates for non-native grasses and forbs) that favor the establishment of silver sagebrush and big sagebrush in disturbed areas, where compatible with the surrounding land use and habitats, unless otherwise requested by the affected landowner.
- Unless requested by the affected landowner, NorVal should use locally adapted sagebrush seed, collected within 100 miles of the areas to be reclaimed, in any sagebrush reclamation.
- NorVal should implement measures to reduce or eliminate colonization of reclaimed areas by noxious weeds and invasive annual grasses such as cheatgrass, to the extent that these species do not exist in undisturbed areas adjacent to the right-of-way.
- Lines should be marked with bird diverters where within 0.25 mile of Buggy Creek and any additional MFWP-recommended anti-collision wire marking locations resulting from ongoing MFWP review of migratory sage-grouse movements in the project area. We recommend marking in compliance with APLIC's Reducing Avian Collisions with Powerlines, The State of the Art in 2012.
- NorVal should comply with all additional measures stipulated by BLM in conjunction with future easement or other authorizations associated with this project in compliance with BLM Instruction Memorandum No. 2012-043, Greater Sage-Grouse Interim Management Policies and Procedures. Such measures may include more restrictive site-specific buffers and timing restrictions, line marking, and perch inhibitor installation.

Sprague's Pipit:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.
- Control unauthorized off-road vehicle access to the construction ROW through the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; or plant conifers or other appropriate trees or shrubs in accordance with landowner or manager request where such plantings would not diminish the quality of adjacent Sprague's pipit habitat.
- If construction would occur during the April 15 to July 15 grassland ground-nesting bird nesting season, pre-construction nest-drag surveys should be completed to determine the presence or absence of nests where the proposed line traverses native prairie on federal land in eastern Montana. Alternatively, construction could be completed outside of the nesting season in native prairie habitats.
- Delay construction activity until young have fledged from April 15 to July 15 within 330 feet of discovered active Sprague's pipit nests in eastern Montana.

We also recommend the following measure:

 The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible; particularly optimal and moderate potential Sprague's pipit habitat suitability classes as mapped by the MNHP (available electronically from MNHP). Where feasible, facilities should be buried where traversing such habitats is unavoidable.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction of transmission lines and appurtenant infrastructure and access, even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans, avian protection plans (APPs), and bird conservation plans, and to implement those measures prior to/during construction.

Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions has, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

To minimize the electrocution and collision hazards to birds, we generally recommend that new power lines be buried where feasible. Where this is not feasible, we recommend that any proposed newly constructed or modified overhead power lines or substations be designed and built to the APLIC standards in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.* To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, daytime visual markers should be installed on proposed lines within 0.25 mile of the Milk River, Fort Peck Lake, all other open water or emergent wetland areas traversed by the route, and all other areas as recommended during your coordination with MFWP and BLM per techniques outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 2012.*

To the maximum extent practicable, project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season. We recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species. If work is proposed to take place during the breeding season or at any other time which may result in take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent take all practicable measures to avoid and minimize take, such as maintaining adequate buffers, to protect the birds until the young have fledged. Active nests may not

be removed. The Service further recommends that if field surveys for nesting birds are conducted with the intent of avoiding take during construction, any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be maintained.

Certain activities may require a permit from the Service's Migratory Bird Management Division. Please contact the Region 6 Migratory Bird Permits Office if you are uncertain if activities may result in take of migratory birds, eggs, or nests. Additional information about permits can be found at http://www.fws.gov/migratorybirds/mbpermits.html. Service guidance regarding bird nest destruction can be found at http://www.fws.gov/policy/m0208.pdf.

Bald and Golden Eagles

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, feeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A permit is required for any legal take of bald or golden eagles or their nests (whether occupied or unoccupied). Limited issuance of permits to take bald and golden eagles can be authorized "for the protection of . . .other interests in any particular locality" where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided. No one is required to seek a permit for any activity. However, where an activity results in take, it is a violation of BGEPA unless a permit authorizing that take has been obtained prior to the action.

Both bald and golden eagles occur in the general project area year round. Both species have been known to congregate during winter at the north end of Fort Peck Lake. Based on 2013 Montana Natural Heritage Program data, we are not aware of bald or golden eagle nests within a mile of the proposed route. However, as-yet undetected nests may be present and we recommend a survey for eagle and other raptor nests be conducted within a mile of the proposed line prior to construction. Bald eagle nests are most commonly distributed in trees around the periphery of lakes and large reservoirs, and linearly along forested corridors of major rivers such as the Milk and Missouri rivers, usually within 1 mile of shore. Golden eagles generally nest on cliffs or trees; usually in open or semi-open habitat.

During the nesting season, especially early in the season, eagles can be very sensitive to disturbance near the nest site and may abandon the nest as a result of low-level disturbance, even from foot traffic. Where construction is proposed in proximity to a bald eagle nest, concentrated foraging area, or communal roost site, we recommend that at a minimum, NorVal comply with siting recommendations, seasonal restrictions, and distance buffers specified in the 2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994). A nest buffer of at least 0.5 mile should be maintained for bald eagles. The Service's May 2007, National Bald Eagle Management Guidelines contains additional information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/ Migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.p df.

The Service has not issued golden eagle management guidelines. However, appropriate buffers for nests and other important use areas based on site-specific conditions should be developed in conjunction with this office if project activities are proposed in proximity to such areas. In Montana, the Service generally recommends avoidance of occupied nest site disturbance between January 1 and August 15. Depending on site-specific conditions, the typically recommended 0.5-mile buffer distance for bald eagle important use areas may be inadequate to ensure avoidance of golden eagle disturbance; larger buffers may be warranted. We therefore recommend avoidance of occupied golden eagle territories where practicable; maximizing distances between nests (including alternate nests) and the siting of proposed project features; avoidance of occupied nest site disturbance during the nesting season; and avoidance / minimization of impacts to important golden eagle habitat (e.g., shrub-steppe and native grasslands) within golden eagle territories.

Whether or not an active bald or golden eagle nest is present, we again recommend implementation of measures to address potential avian electrocution or collision along portions of the route, as discussed above, due to eagle and other potential migratory bird activity in the area.

Other Comments

We strongly recommend continued coordination with MFWP, BLM, and the MNHP. These agencies may be able to provide updated, site-specific information regarding threatened, endangered, and sensitive species; eagle and other raptor nest locations; and other fish and wildlife resources occurring in the proposed project area.

Construction timing and distance buffers for sharp-tailed grouse and several other wildlife species are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. We recommend that NorVal adhere to these construction timing and distance buffers where applicable and possible.

We support the recommendations provided by MFWP in their coordination with NorVal to date. Sensitive resources that should be considered in final siting of all project facilities include threatened, endangered, and candidate species and their habitat, bald and golden eagle and other migratory bird species nesting and habitat; wetlands; ephemeral, intermittent and permanent streams; naturally wooded draws; sagebrush habitat; and native prairie. Additional general recommendations include:

- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels;
- Enact best management practices to avoid and minimize the spread of noxious weeds and other undesirable exotic plant species within the proposed project area;
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.

In conjunction with ESA section 7 consultation process, we request that NorVal provide the Service a written response regarding Norval's intent to apply our recommended conservation measures for listed and candidate threatened and endangered species as provided above under **Threatened and Endangered Species**. Also, as stated above, NorVal should inform the Service in writing as to any additional potential conservation measures listed in the BA that it intends to enact, including any elements of the sage-grouse mitigation plan in the BA Appendix O. We understand that Norval intends to enact the measures listed in their Black Coulee project and past correspondence synopsis (dated December 4, 2012). We would also appreciate notification as to what recommendations provided above under **Migratory Birds** and **Bald and Golden Eagles** NorVal intends to implement.

Thank you for the opportunity to review and comment on this proposed project. Please telephone Jeff Berglund at 406/449-5225, ext. 206, if you have any questions regarding this matter.

Sincerely,

Brent Esmoil Acting Field Supervisor



P.O. Box 951 Glasgow, MT 59230 Phone (406) 228-9351 Fax (406) 367-9306 P.O. Box 287 Opheim, MT 59250 Phone (406) 762-3411 Fax (406) 762-3352

April 8, 2013

United States Department of the Interior Fish and Wildlife Service Ecological Services Montana Field Office Attn: Jeff Berglund 585 Shepard Way, Suite 1 Helena, MT 59601

Re: NorVal Electric Cooperative, Inc. Black Coulee Transmission Line

Dear Jeff:

Thank you for your letter of February 19, 2013, commenting on the transmission line of NorVal Electric Cooperative, Inc. Let me first note that it was appreciated that the content of your letter addressed actual concerns immediately associated with the transmission line and corridor rather than every possible species for a hundred miles around. Narrowing the field and calling out specific concerns has helped greatly in our efforts to address these areas and develop a solution.

NorVal Electric accepts your letter and will follow all recommendations as closely as possible. Changes and clarifications are noted below.

Increase Number and Locations of Bird Flight Diverters - NorVal will increase the number of Bird Flight Diverters to include all locations where the power line comes within .25 miles on either side of the Milk River to reduce incidences of avian collisions. Additional Bird Flight Diverters will be placed for .25 miles on either side of two unnamed reservoirs

Precautions for Black Footed Ferret - The area suspect of being habitat for the Prairie dog and the black footed ferret has been assessed by personnel from the Glasgow office of the Montana Fish Wildlife and Parks. There is no indication of either the Prairie dog or the black footed ferret anywhere along the transmission line corridor. We accept your assessment that no adverse effect to any black footed ferrets would be anticipated. No further action will be taken.

Precautions near Milk River for pallid Sturgeon - The February 19, 2013 letter stated the pallid sturgeon was listed in the Biological Assessment as being in the Yellowstone and Missouri River systems, and documented occurrences in the Milk River above where the transmission line will cross. The construction practices used for crossing a small river like the Milk River will not necessitate any equipment or machinery

crossings. There will be minor foot traffic on either side, which amounts to throwing a length of mule tape, used for drawing the cable through the sheaves on the insulators, from one side of the river to the other. There will be no disturbance on either riverbank other than boot tracks. There will be no vegetation disturbed and the water will not be muddied. No further action will be taken.

Noxious Weeds – There are areas of noxious weed infestations indicated by the original survey. The local Weed District Supervisor has been notified of the route and of a commitment to make sure the equipment used does not contribute to the spread of any noxious weeds. He has been provided with a map of areas revealed to us and will be on hand during the initial phases of construction to assist the construction in BMP's to avoid spread. Washing of equipment will be done as needed.

Greater Sage Grouse Concerns - It seems the greater sage grouse garners the greatest amount of attention along the corridor of the transmission line. One issue is the proximity of the activities associated with the power line to sage grouse leks causing disturbance to their habitat. The second is the power line providing perches for birds of prey to hunt the sage grouse. Of the three leks that are within the three-mile radius of the power line, two of them have been determined to be abandoned. The third is in an area that has already been addressed by the Keystone XL pipeline. The power line in this area is only 0.5 miles from the proposed pipeline and is across a county road for a portion of this distance. This insulators listed in the letter are called out as horizontal post insulators. The insulators that will be used are actually angled upward at a twenty degree angle. It has been suggested that this angle and the type of insulator being used is less accommodating to raptor perching.

Using maps obtained from the Montana Fish Wildlife & Parks, the locations of the three leks at the north end of the transmission line were placed on Google Maps. Using features in Google Earth a profile was developed from the site of the lek to the nearest point on the proposed transmission line. In all cases, the transmission line will be hidden from view of the lek (See attachments). Other than maintaining a watch for any new activity, no additional measures will be taken.

Additional Bird Species – There are additional bird species listed in the letter, Whooping Crane, Piping Plover, interior least tern, migratory birds, and Sprague's pipit, that have to be addressed. However, the same measures to protect them, their flight paths, and their habitat are already being implemented on behalf of aforementioned species. In an email from the Montana Fish Wildlife and Parks, no known nesting sites were reported in the area of the transmission line. No additional measures will be taken.

Additional Measures – It is not impossible that during construction additional measures may become necessary. These include but are not limited to: Additional Bird Flight Diverters if areas or flight patterns dictate. Timing of construction in certain areas may have to be adjusted to accommodate activities or discoveries.

NorVal Electric Cooperative, Inc. has and will continue to work closely with MFWP, BLM, and the Montana Natural Heritage Program (MNHP). NorVal will observe and adhere, as much as possible as it pertains to transmission line construction, to construction timing and distance buffers for sharp-tailed grouse and other wildlife species as stipulated in the 168 page Attachment 1B of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act, and to the recommendations as outlined on page four of the February 19th, 2013 letter from the US Fish and Wildlife Service.

arg Craig Herbert

General Manager NorVal Electric Cooperative, Inc.



McCONE ELECTRIC CO-OP., INC.

P.O. Box 368 CIRCLE, MONTANA 59215 www.mcconeelectric.coop TELEPHONE (406) 485-3430 (800) 684-3605 FAX (406) 485-3397

March 1, 2013

Brent Esmoil U.S. Fish and Wildlife Service Ecological Services 585 Shepard Way, Suite 1 Helena, MT 59601-6287 RECEIVED BY MAR 8 2013 FWS ES FIELD OFFICE

Dear Mr. Esmoil:

This letter is in response to your February 19, 2013, regarding McCone Electric Cooperative's service line in connection with the proposed Keystone XL Pipeline project. McCone will comply with the environmental stipulations lined out in the Keystone EIS.

McCone Electric Cooperative intends to comply with the Services recommended conservation measures regarding the Black Footed Ferret as follows:

- Workers will not be allowed to keep domestic pets in construction camps and/or worksites.
- Workers will be made aware of how canine distemper and sylvatic plague disease are spread, via domestic pets and fleas.
- Workers will not feed wildlife.
- Concentrations of dead and/or apparently diseased animals will be reported to the appropriate state and federal agencies.

McCone Electric Cooperative intends to comply with the Services recommended conservation measures regarding the **Whooping Crane** as follows:

- All equipment maintenance and repairs will be performed in upland locations at least 100 feet from water bodies and wetlands
- All equipment will be parked overnight at least 100feet from a watercourse or wetland.


- · Equipment will not be washed in streams or wetlands.
- Construction and restoration will be conducted to allow for prompt and effective cleanup of spills of fuel or other hazardous materials.
- Each construction and cleanup crew will have the necessary tools and materials to stop leaks, including but not limited to absorbent and barrier materials.
- Refueling and lubrication of equipment will be restricted to upland areas at least 100 feet away from streams and wetlands.
- A 100 foot area around the river crossings will be kept free from hazardous material, fuel storage, and vehicle fuel transfers.
- The line within 0.25 miles of both Buffalo Springs Creek and the Redwater River, will be marked in compliance with APLIC's *Reducing Avian Collisions with Power Lines, State* of the Art in 2012.
- If whooping cranes are sighted during spring or fall migrations periods, McCone will immediately contact the Service and Montana Fish, Wildlife and Parks for further instruction. Activity would be delayed until the whooping cranes leave the area.

McCone Electric Cooperative intends to comply with the Services recommended conservation measures regarding the Sprague's Pipit as follows:

- · Disturbed areas will be reseeded with a native seed mix after topsoil replacement.
- · Access to the ROW will be controlled, via fences with locking gates, signs, and fences.
- If active Sprague's pipit's nests are discovered, construction activity will be delayed within 330 feet of the nest, until the young have fledged.
- If possible construction activities will take place out side of the April 15 July 15 ground nesting season.
- The power line will be sited to avoid and minimize encroachment on native prairie habitats.

McCone Electric Cooperative intends to comply with the Services recommended conservation measures regarding the **Migratory Birds and Bald Eagles** as follows:

- The overhead power lines will be constructed and built to the APLIC standards in Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Attached is an example of a pole that will be used in the construction of the line.
- Visual Markers will be installed on the lines within 0.25 miles of Buffalo Springs Creek and the Redwater River per Techniques outlined in *Mitigating Bird Collisions with Power Lines: The state of the Art in 2012.*
- If possible, construction will be scheduled to not disrupt nesting raptors or other migratory bird during the breeding season.

• If a bald or golden eagle nest is discovered during construction activities, McCone will comply with the siting recommendations, seasonal restrictions and distance buffers specified in the 2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plane (1994)

McCone Electric Cooperate agrees to do the following:

- Install and maintain appropriate erosion control measures adjacent to wetlands and stream channels;
- Enact BMP's to avoid and minimize the spread of noxious weeds and other exotic plant species;
- · Confine disturbed area along ROWs as narrow as possible; and
- · Re-vegetate disturbed areas with appropriate native species.

Sincerely, McCone Electric Co-op., Inc.

Mike C. Kays General Manager

Attachment: Sample Pole Framing Construction Drawing

December 21, 2012

Mr. John Cochnar, Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

McCone Electric Co-op., Inc., a power provider located in Circle, MT, is providing electric service to Pump Station 12 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed is a proposed map of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely, McCone Electric Co-op., Inc.

Mike C. Kays General Manager

Enclosure:



United States Department of the Interior Fish and Wildlife Service



Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 Phone: (406) 449-5225 Fax: (406) 449-5339

February 19, 2013

Mike C. Kays McCone Electric Cooperative P.O. Box 368 Circle, MT 59215

Dear Mr. Kays:

This letter responds to your December 21, 2012 letter, received in our office on January 8, 2013, and your request for U.S. Fish and Wildlife Service (Service) comments on McCone Electric Cooperative's (McCone) proposed electric service line in connection with the proposed Keystone XL pipeline project Pump Site #12 through McCone County, Montana. Your letter included proposed route maps; information regarding the proposed line configuration, etc. was not provided. Our response comments are authorized under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703 et seq.), as amended, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), as amended, and the Fish and Wildlife Coorclination Act (16 U.S.C. 661 *et seq.*).

We understand that the approximate 5 mile-long 115 kV line is proposed to provide power to Keystone XL's proposed Pump Site #12 in McCone County. The line would cross Buffalo Springs Creek and the Redwater River. It is also our understanding that this proposed power line is subject to the provisions of the March 30, 2012 Montana Department of Environmental Quality (MDEQ) Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities, including its Attachment 1B (Environmental Stipulations). Our comments and recommendations regarding listed and candidate threatened and endangered species are provided below. Additional recommendations pertaining to eagles and other migratory birds are provided for your consideration in subsequent sections.

Threatened and Endangered Species

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs (DOS) completed a Biological Assessment (BA) for the proposed Keystone XL Project on December 21, 2012. General threatened and endangered species conservation measures that could be applied to power line projects proposed in conjunction with the Keystone XL Project were included in the BA. However, determinations as to which specific conservation measures would be applied to which

specific proposed power lines were not provided in the BA; such determinations were left to further consultation between Service Ecological Services Field Offices and proposed power providers in each affected state. Your December 21, 2012 letter stated that McCone will consult with this office on mitigation and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in specific areas along the proposed power line corridor. We do not anticipate that the interior least tern or piping plover occur in the project area. Although not specified in your letter, the listed endangered black-footed ferret (included in the BA) should also be included in this consultation. We further recommend that your consultation include the candidate greater sage-grouse and Sprague's pipit, which were also included in the BA.

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed and candidate species and designated critical habitat may occur in the general proposed Pump Site #12 power line project region:

Scientific Name	Common Name	Status	Montana Range/Habitat
Mustela nigripes	Black-footed	LE	Prairie dog complexes; eastern Montana
Grus americana	Whooping Crane	LE	Wetlands; migrant eastern Montana
Centrocercus urophasianus	Greater Sage- Grouse	С	Eastern, central, and southwestern Montana in sagebrush, sagebrush- grasslands, and associated agricultural lands
Anthus spragueii	Sprague's Pipit	С	Grassland habitats with little or no shrub cover east of the Continental Divide

*LE = Listed Endangered; C = Candidate Species

Based on the BA, we understand that no prairie dog towns would be traversed by the proposed route. Consequently, we anticipate no adverse effects to black-footed ferrets as a result of the proposed project. Whooping cranes may occur as rare spring and fall migrants, using suitable stopover habitat in the area. The project occurs within the general breeding range of the Sprague's pipit, and general yearround range of the greater sage-grouse. Potential Sprague's pipit habitat suitability in the project vicinity is classified as low to not suitable by the Montana Natural Heritage Program (MNHP). According to Appendix N of the BA, no greater sage-grouse leks or core habitat occur within several miles of the proposed transmission line route.

Candidate species are those placed on the candidate list for future action, meaning those species do not receive statutory protection under the ESA. Candidates are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Federal agencies and non-federal applicants can conference with the Service pursuant to section 7(a)(4) of ESA to ensure that their actions do not negatively impact candidate species. Some federal agencies provide the same level of protection to candidate species as proposed or listed species and take appropriate measures to

avoid impacts. Candidate species are included in the BA, and it is our understanding that the DOS intends to enact this level of protection relative to the Keystone XL project; including ancillary facilities such as the proposed power line.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the federal agency or its designated agent determines the action "may affect, is likely to adversely affect" listed species or critical habitat, the responsible federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "may affect, not likely to adversely affect" determination, concurrence from this office is required. If the evaluation shows a "no effect" determination for listed species or critical habitat, further consultation is not necessary. If a private entity receives federal funding for a construction project, or if any federal permit or license is required, the federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species or designated critical habitat.

As stated above, the proposed power line project is included in the ESA section 7 consultation (as documented the BA) underway relative to the overall proposed Keystone XL pipeline project. Also, as an "associated facility", the power line is subject to the provisions of the March 30, 2012 MDEQ Environmental Quality Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities, including its Attachment 1B (Environmental Stipulations). As such, we expect that all applicable conservation measures identified in the final BA and the Environmental Stipulations will be implemented relative to this proposed power line project.

The following conservation measures are included in the BA and are applicable and recommended relative to this proposed power line project. Repetitive measures (per the BA) are only listed once. Recommended additions or revisions to these measures pertaining to the power line project, as well as other comments, are indicated in italics. Measures in the Environmental Stipulations are not repeated below as they are expected to be implemented for these species where applicable.

Black-footed Ferret:

- Workers would not be allowed to keep domestic pets in construction camps and/or worksites.
- Workers would be made aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas).
- Workers would not be allowed to feed wildlife.
- Concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) would be reported to the appropriate state and federal agencies.

Whooping Crane:

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible.
- Equipment would not be washed in streams or wetlands.

- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- Keystone would mark and maintain a 100-foot area from these river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers.
- Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat at the discretion of the local Ecological Services Field Office, based on the biological needs of the whooping crane. Marking is recommended within 0.25 mile of Buffalo Springs Creek and the Redwater River. We recommend marking in compliance with APLIC's Reducing Avian Collisions with Powerlines, The State of the Art in 2012.

We also recommend the following measure:

 During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, McCone would immediately contact the Service and Montana Fish, Wildlife, and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area.

Greater Sage-Grouse: We recommend no additional greater sage-grouse measures to those contained in the Environmental Stipulations:

Sprague's Pipit:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.
- Control unauthorized off-road vehicle access to the construction ROW through the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; or plant conifers or other appropriate trees or shrubs in accordance with landowner or manager request where such plantings would not diminish the quality of adjacent Sprague's pipit habitat.
- Delay construction activity until young have fledged from April 15 to July 15 within 330 feet of discovered active Sprague's pipit nests in eastern Montana.

We also recommend the following measures:

- To the extent feasible, complete construction in native prairie habitats outside of the April 15 to July 15 grassland ground-nesting bird nesting season.
- The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction of transmission lines and appurtenant infrastructure and access, even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans, avian protection plans (APPs), and bird conservation plans, and to implement those measures prior to/during construction.

Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions has, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

To minimize the electrocution and collision hazards to birds, we generally recommend that new power lines be buried where feasible. Where this is not feasible, we recommend that any proposed newly constructed or modified overhead power lines or substations be designed and built to the APLIC standards in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.* To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, daytime visual markers should be installed on proposed lines within 0.25 mile of Buffalo Springs Creek and the Redwater River per techniques outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 2012.*

To the maximum extent practicable, project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season. We recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species. If work is proposed to take place during the breeding season or at any other time which may result in take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent take all practicable measures to avoid and minimize take, such as maintaining adequate buffers, to protect the birds until the young have fledged. Active nests may not be removed. The Service further recommends that if field surveys for nesting birds are conducted with the intent of avoiding take during construction, any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be maintained.

Certain activities may require a permit from the Service's Migratory Bird Management Division. Please contact the Region 6 Migratory Bird Permits Office if you are uncertain if activities may result in take of migratory birds, eggs, or nests. Additional information about permits can be found at http://www.fws.gov/migratorybirds/mbpermits.html. Service guidance regarding bird nest destruction can be found at http://www.fws.gov/policy/m0208.pdf.

Bald and Golden Eagles

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, reeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A permit is required for any legal take of bald or golden eagles or their nests (whether occupied or unoccupied). Limited issuance of permits to take bald and golden eagles can be authorized "for the protection of . . .other interests in any particular locality" where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided. No one is required to seek a permit for any activity. However, where an activity results in take, it is a violation of BGEPA unless a permit authorizing that take has been obtained prior to the action.

Based on 2013 Montana Natural Heritage Program data, we are not aware of bald or golden eagle nests within a mile of the proposed route. However, as-yet undetected nests may be present. During the nesting season, especially early in the season, eagles can be very sensitive to disturbance near the nest site and may abandon the nest as a result of low-level disturbance, even from foot traffic. Where construction is proposed in proximity to a bald eagle nest, concentrated foraging area, or communal roost site, we recommend that at a minimum, McCone comply with siting recommendations, seasonal restrictions, and distance buffers specified in the *2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994).* A nest buffer of at least 0.5 mile should be maintained for bald eagles. The Service's May 2007, National Bald Eagle Management Guidelines contains additional information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/Migratorybirds //CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

The Service has not issued golden eagle management guidelines. However, appropriate buffers for nests and other important use areas based on site-specific conditions should be developed in conjunction with this office if project activities are proposed in proximity to such areas. In Montana, the Service generally recommends avoidance of occupied nest site disturbance between January 1 and August 15. Depending on site-specific conditions, the typically recommended 0.5-mile buffer distance for bald eagle important use areas may be inadequate to ensure avoidance of golden eagle disturbance; larger buffers may be warranted. We therefore recommend avoidance of occupied golden eagle territories where practicable; maximizing distances between nests (including alternate nests) and the siting of proposed project features; avoidance of occupied nest site disturbance during the nesting season; and avoidance / minimization of impacts to important golden eagle habitat (e.g., shrub-steppe and native grasslands) within golden eagle territories.

Whether or not an active bald or golden eagle nest is present, we again recommend implementation of measures to address potential avian electrocution or collision along portions of the route, as discussed above, due to eagle and other potential migratory bird activity in the area.

Other Comments

We strongly recommend continued coordination with MFWP, BLM, and the MNHP. These agencies may be able to provide updated, site-specific information regarding threatened, endangered, and sensitive species; eagle and other raptor nest locations; and other fish and wildlife resources occurring in the proposed project area.

Construction timing and distance buffers for several wildlife species are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. We recommend that McCone adhere to these construction timing and distance buffers where applicable.

Sensitive resources that should be considered in final siting of all project facilities include threatened, endangered, and candidate species and their habitat, bald and golden eagle and other migratory bird species nesting and habitat; wetlands; ephemeral, intermittent and permanent streams; naturally wooded draws; sagebrush habitat; and native prairie. Additional general recommendations include:

- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels;
- Enact best management practices to avoid and minimize the spread of noxious weeds and other undesirable exotic plant species within the proposed project area;
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.

In conjunction with ESA section 7 consultation process, we request that McCone provide the Service a written response regarding McCone's intent to apply our recommended conservation measures for

listed and candidate threatened and endangered species as provided above under **Threatened and Endangered Species**. Also, McCone should inform the Service in writing as to any additional potential conservation measures listed in the BA that it intends to enact. We would also appreciate notification as to what recommendations provided above under **Migratory Birds** and **Bald and Golden Eagles** McCone intends to implement.

Thank you for the opportunity to review and comment on this proposed project. Please telephone Jeff Berglund at 406/449-5225, ext. 206, if you have any questions regarding this matter.

Sincerely,

Brent Esmoil Acting Field Supervisor



BILLINGS OFFICE: 3521 GABEL ROAD, BILLINGS, MONTANA 59102 • PHONE: 406-259-9933 • FAX: 406-259-3441

ELECTRICAL CONSULTANTS, INC.

January 9, 2013

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Dear Mr. Cochnar:

Tongue River Electric Cooperative, Inc. (TRECO), a power provider located in Ashland, MT is providing electric service to Pump Station 13 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with to power lines being constructed by all power providers has to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Please feel free to contact me at 406-784-2341 with any questions or comments you may have. My address is also shown below:

Tongue River Electric Cooperative PO Box 138 Ashland, MT 59003

Sincerely,

Alala

Alan See, General Manager Tongue River Electric Cooperative

TUCSON OFFICE. 6740 NORTH ORACLE RD, #100 TUCSON, AZ 85704 PHONE: 520-219-9933 FAX: 520-219-9949 EMAIL: <u>contact-us@ecituc.com</u> MADISON OFFICE: 2800 ROYAL AVENUE MADISON, WI 53718 PHONE: 608-240-9933 FAX: 608-240-1579 EMAIL: <u>contact-us@ecimadison.com</u>



United States Department of the Interior Fish and Wildlife Service



Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 Phone: (406) 449-5225 Fax: (406) 449-5339

February 19, 2013

Alan See Tongue River Electric Cooperative P.O. Box 138 Ashland, MT 59003

Dear Mr. See:

This letter responds to your January 28, 2013 letter, received in our office on February 4, 2013, and your request for U.S. Fish and Wildlife Service (Service) comments on Tongue River Electric Cooperative's (TREC) proposed power line in connection with the proposed Keystone XL pipeline project through Prairie County, Montana. Your letter included a proposed route map; information regarding the proposed line configuration, etc. was not provided. Our response comments are authorized under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703 et seq.), as amended, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), as amended, and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

We understand that the approximate 15.2 mile-long 115 kV line is proposed to provide power to Keystone XL's proposed Pump Site #13 in Prairie County. Our comments and recommendations regarding listed and candidate threatened and endangered species are provided below. Additional recommendations pertaining to eagles and other migratory birds are provided for your consideration in subsequent sections.

Threatened and Endangered Species

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs (DOS) completed a Biological Assessment (BA) for the proposed Keystone XL Project on December 21, 2012. General threatened and endangered species conservation measures that could be applied to power line projects proposed in conjunction with the Keystone XL Project were included in the BA. However, determinations as to which specific conservation measures would be applied to which specific proposed power lines were not provided in the BA; such determinations were left to further consultation between Service Ecological Services Field Offices and proposed power providers in each affected state. Your January 28, 2013 letter stated that TREC will consult with this office on mitigation and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in specific

areas along the proposed power line corridor. We do not anticipate that the piping plover occurs in the project area. Although not specified in your letter, the listed endangered black-footed ferret and pallid sturgeon (included in the BA) should also be included in this consultation. We further recommend that your consultation include the candidate greater sage-grouse and Sprague's pipit, which were also included in the BA.

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed and candidate species and designated critical habitat may occur in the general proposed power line project region:

Scientific Name	Common Name	Status	Montana Range/Habitat
Mustela nigripes	Black-footed Ferret	LE	Prairie dog complexes; eastern Montana
Scaphirhynchus albus	Pallid Sturgeon	LE	Bottom dwelling; Milk, Missouri, Yellowstone rivers, Fort Peck Lake
Sterna antillarum athalassos	Interior Least Tern	LE	Yellowstone, Missouri River sandbars, beaches, Fort Peck Lake; eastern Montana
Grus americana	Whooping Crane	LE	Wetlands; migrant eastern Montana
Centrocercus urophasianus	Greater Sage- Grouse	С	Eastern, central, and southwestern Montana in sagebrush, sagebrush- grasslands, and associated agricultural lands
Anthus spragueii	Sprague's Pipit	С	Grassland habitats with little or no shrub cover east of the Continental Divide

*LE = Listed Endangered; C = Candidate Species

Most of the above species have been documented in the general project area. Based on the BA, we understand that no prairie dog towns would be traversed by the proposed route. Consequently, we anticipate no adverse effects to black-footed ferrets as a result of the proposed project. The pallid sturgeon and interior least tern occur in the Yellowstone River system. Whooping cranes may occur as rare spring and fall migrants, using suitable stopover habitat in the area. The project occurs within the general breeding range of the Sprague's pipit, and general year-round range of the greater sage-grouse. Potential Sprague's pipit habitat suitability in the project vicinity is classified as low to not suitable by the Montana Natural Heritage Program (MNHP). According to Appendix N of the BA, no greater sage-grouse leks or core habitat occur within several miles of the proposed transmission line route.

Candidate species are those placed on the candidate list for future action, meaning those species do not receive statutory protection under the ESA. Candidates are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Federal agencies and non-federal applicants can conference with the Service pursuant to section 7(a)(4) of ESA to ensure that their actions do not negatively impact candidate species. Some federal agencies provide the same

level of protection to candidate species as proposed or listed species and take appropriate measures to avoid impacts. Candidate species are included in the BA, and it is our understanding that the DOS intends to enact this level of protection relative to the Keystone XL project; including ancillary facilities such as the proposed power line.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the federal agency or its designated agent determines the action "may affect, is likely to adversely affect" listed species or critical habitat, the responsible federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "may affect, not likely to adversely affect" determination, concurrence from this office is required. If the evaluation shows a "no effect" determination for listed species or critical habitat, further consultation is not necessary. If a private entity receives federal funding for a construction project, or if any federal permit or license is required, the federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species or designated critical habitat.

As stated above, the proposed power line project is included in the ESA section 7 consultation (as documented the BA) underway relative to the overall proposed Keystone XL pipeline project. Consequently, we expect that all applicable conservation measures identified in the final BA will be implemented relative to this proposed power line project. The following conservation measures are included in the BA and are applicable and recommended relative to this proposed power line project. Repetitive measures (per the BA) are only listed once. Recommended additions or revisions to these measures pertaining to the power line project, as well as other comments, are indicated in italics:

Black-footed Ferret:

- Workers would not be allowed to keep domestic pets in construction camps and/or worksites.
- Workers would be made aware of how canine distemper and sylvatic plague diseases are spread (domestic pets and fleas).
- Workers would not be allowed to feed wildlife.
- Concentrations of dead and/or apparently diseased animals (prairie dogs, ground squirrels, others) would be reported to the appropriate state and federal agencies.

Interior Least Tern: (the first seven measures would also facilitate potential impact avoidance and minimization relative to the whooping crane and pallid sturgeon):

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible.
- Equipment would not be washed in streams or wetlands.
- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid

containment and recovery of spilled materials.

- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- Keystone would mark and maintain a 100-foot area from these river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers.

Whooping Crane: We recommend the following measure:

• During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, TREC would immediately contact the Service and Montana Fish, Wildlife, and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area.

Pallid Sturgeon: We recommend implementation of the seven measures listed above under Interior Least Tern.

Greater Sage-Grouse: We have no specific recommendations relative to greater sage-grouse.

Sprague's Pipit:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.
- Control unauthorized off-road vehicle access to the construction ROW through the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; or plant conifers or other appropriate trees or shrubs in accordance with landowner or manager request where such plantings would not diminish the quality of adjacent Sprague's pipit habitat.
- Delay construction activity until young have fledged from April 15 to July 15 within 330 feet of discovered active Sprague's pipit nests in eastern Montana.

We also recommend the following measures:

- To the extent feasible, complete construction in native prairie habitats outside of the April 15 to July 15 grassland ground-nesting bird nesting season.
- The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction of transmission lines and appurtenant infrastructure and access, even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective

steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans, avian protection plans (APPs), and bird conservation plans, and to implement those measures prior to/during construction.

Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions has, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

To minimize the electrocution and collision hazards to birds, we generally recommend that new power lines be buried where feasible. Where this is not feasible, we recommend that any proposed newly constructed or modified overhead power lines or substations be designed and built to the Avian Power Line Interaction Committee (APLIC) standards in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.*

To the maximum extent practicable, project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season. We recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species. If work is proposed to take place during the breeding season or at any other time which may result in take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent take all practicable measures to avoid and minimize take, such as maintaining adequate buffers, to protect the birds until the young have fledged. Active nests may not be removed. The Service further recommends that if field surveys for nesting birds are conducted with the intent of avoiding take during construction, any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be maintained.

Certain activities may require a permit from the Service's Migratory Bird Management Division. Please contact the Region 6 Migratory Bird Permits Office if you are uncertain if activities may result in take of migratory birds, eggs, or nests. Additional information about permits can be found at http://www.fws.gov/migratorybirds/mbpermits.html. Service guidance regarding bird nest destruction can be found at http://www.fws.gov/policy/m0208.pdf.

Bald and Golden Eagles

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, reeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A permit is required for any legal take of bald or golden eagles or their nests (whether occupied or unoccupied). Limited issuance of permits to take bald and golden eagles can be authorized "for the protection of . . .other interests in any particular locality" where the take is compatible with the preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided. No one is required to seek a permit for any activity. However, where an activity results in take, it is a violation of BGEPA unless a permit authorizing that take has been obtained prior to the action.

Both bald and golden eagles occur in the general project area year round. Based on 2013 Montana Natural Heritage Program data, we are not aware of bald or golden eagle nests within a mile of the proposed route. During the nesting season, especially early in the season, eagles can be very sensitive to disturbance near the nest site and may abandon the nest as a result of low-level disturbance, even from foot traffic. Where construction is proposed in proximity to a bald eagle nest, concentrated foraging area, or communal roost site, we recommend that at a minimum, TREC comply with siting recommendations, seasonal restrictions, and distance buffers specified in the *2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994)*. A nest buffer of at least 0.5 mile should be maintained for bald eagles. The Service's May 2007, National Bald Eagle Management Guidelines contains additional information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/Migratorybirds/CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.p df.

The Service has not issued golden eagle management guidelines. However, appropriate buffers for nests and other important use areas based on site-specific conditions should be developed in conjunction with this office if project activities are proposed in proximity to such areas. In Montana, the Service generally recommends avoidance of occupied nest site disturbance between January 1 and August 15. Depending on site-specific conditions, the typically recommended 0.5-mile buffer distance for bald eagle important use areas may be inadequate to ensure avoidance of golden eagle disturbance; larger buffers may be warranted. We therefore recommend avoidance of occupied golden eagle

territories where practicable; maximizing distances between nests (including alternate nests) and the siting of proposed project features; avoidance of occupied nest site disturbance during the nesting season; and avoidance / minimization of impacts to important golden eagle habitat (e.g., shrub-steppe and native grasslands) within golden eagle territories.

Whether or not an active bald or golden eagle nest is present, we again recommend implementation of measures to address potential avian electrocution along the entire route, as discussed above, due to eagle and other potential migratory bird activity in the area.

Other Comments

We strongly recommend continued coordination with MFWP and the MNHP. These agencies may be able to provide updated, site-specific information regarding threatened, endangered, and sensitive species; eagle and other raptor nest locations; and other fish and wildlife resources occurring in the proposed project area.

Construction timing and distance buffers for several other wildlife species are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 Montana Department of Environmental Quality Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. We recommend that TREC adhere to these construction timing and distance buffers where applicable and possible.

Sensitive resources that should be considered in final siting of all project facilities include threatened, endangered, and candidate species and their habitat, bald and golden eagle and other migratory bird species nesting and habitat; wetlands; ephemeral, intermittent and permanent streams; naturally wooded draws; sagebrush habitat; and native prairie. Additional general recommendations include:

- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels;
- Enact best management practices to avoid and minimize the spread of noxious weeds and other undesirable exotic plant species within the proposed project area;
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.

In conjunction with ESA section 7 consultation process, we request that TREC provide the Service a written response regarding TREC's intent to apply our recommended conservation measures for listed and candidate threatened and endangered species as provided above under **Threatened and Endangered Species**. We would also appreciate notification as to what recommendations provided above under **Migratory Birds** and **Bald and Golden Eagles** TREC intends to implement. Thank you for the opportunity to review and comment on this proposed project. Please telephone Jeff Berglund at 406/449-5225, ext. 206, if you have any questions regarding this matter.

Sincerely,

3.8 The

Brent Esmoil Acting Field Supervisor



TONGUE RIVER ELECTRIC COOPERATIVE, INC.

P.O. BOX 138 • ASHLAND, MT 59003-0138 • OFFICE: 406-784-2341 • FAX NUMBER: 406-784-2279

April 10, 2013

Mr. Robert R. Harms Fish and Wildlife Biologist US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

RE: Tongue River Electric Cooperative's (TRECO's) 115 kV Transmission Line to support Keystone XL Pump Station No. 13.

Dear Mr. Harms:

Tongue River Electric Cooperative, Inc. (TRECO), a power provider located in Ashland, MT is providing electric service to Pump Station 13 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

On December 23, 2010 R. Mark Wilson, Field Supervisor with the Montana Field Office of the USFWS issued a response to our request for information on the potential impacts associated with our proposed overhead power line. This letter indicated that the federally listed threatened, endangered, candidate or proposed species that may be affected by this project include whooping crane (*grus americana*), an endangered species, greater sage-grouse (*Centrocercus urophasianus*), and Sprague's pipit (*Anthus spragueii*), both candidate species.

The proposed alignment for the 115 kV Transmission line is approximately 50 miles west of the established Whooping Crane migratory corridor which generally traverses North and South Dakota. The line will not cross the Yellowstone River. The first 3 miles of the proposed line crosses cultivated agricultural ground and areas adjacent to the developed town of Fallon, MT. The remaining 12.3 miles lay south of and parallel to the Yellowstone River. As a vast majority of Whooping Crane sitings occur within the migratory corridor, no mitigation measures are proposed for Whooping Crane along the PS 13 Transmission Line.

Greater sage-grouse habitat is found in generally native, non-segmented lands. Avoidance is the proposed mitigation for the PS 13 Transmission Line project. The route has been sited to follow existing land segmentation (interstates, railroads, urban development) or areas of cultivated agricultural land generally avoiding any areas of potential habitat. See attached route map. No other mitigation measures are proposed for sage-grouse.

According to a study on the Effects of Management Practices on Grassland Birds: Sprague's Pipit [1], the proposed alignment for the 115 kV Transmission line exists south of the areas identified as having less than 5% of any individuals detected per route per year [2]. As the area of the proposed project does not represent an area of frequently occupied habitat, no mitigation measures are proposed for Sprague's Pipit along the PS 13 Transmission Line.

Please feel free to contact me at 406-784-2341 with any questions or comments you may have. My address is also shown below:

Tongue River Electric Cooperative PO Box 138 Ashland, MT 59003

Sincerely,

Alale

Alan See, General Manager Tongue River Electric Cooperative

Citations:

[1] Study reference from Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, and B.R. Euliss. 1988 (Revised 2001). Effects of management practices on grassland birds: Sprague's Pipit. Northern Prairie Wildlife Research Center, Jamestown, ND. 15 pages.

[2] Map reference from Price, J., S. Droege, and A. Price. 1995. The summer atlas of North American birds. Academic Press, London, England. 364 pages.

WONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc.

> 400 North Fourth Street Bismarck, ND 58501 (701) 222-7900

December 28, 2012

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc. (Montana-Dakota), a utility providing electric power service in Montana, intends to provide electric service to Pump Station 14 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers on this project have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we have consulted with the USFWS and Montana Fish, Wildlife and Parks and agreed to reroute a portion of the power line to minimize wildlife impacts. Montana-Dakota agrees to continue consultation with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines showing the updated route we intend to permit and build to service the Keystone XL Project. If there are any additional comments from the USFWS on required mitigative measures and where they need to be incorporated, or if the agency would like to discuss the project in further detail, please contact me at 701-222-7844.

Sincerely,

Abbie Krebsbach Environmental Manager

Enclosure

cc: Henry Ford, Transmission Manager Andrea Stomberg, Vice President of Electric Supply WONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc.

> 400 North Fourth Street Bismarck, ND 58501 (701) 222-7900

February 6, 2012

John Ensign Regional Wildlife Manager Montana Fish, Wildlife & Parks PO Box 1630 Miles City, MT 59301

Dear Mr. Ensign:

We appreciated visiting with Howard Burt on June 21 near Plevna, MT to discuss the route Montana-Dakota Utilities Co.'s (Montana-Dakota) had proposed for the transmission line to serve electricity to TransCanada's Keystone XL Pipeline Pump Station #14. Montana-Dakota had been contacted by TransCanada regarding sage grouse lek concerns included in the Montana Department of Environmental Quality Environmental Impact Statement review of concerns for the Keystone XL Pipeline project. There were two identified active sage grouse leks in close proximity to the proposed transmission line routed on private property in Section 35 of Township 9N Range 58E.

During our meeting with Mr. Burt on the transmission line route near Plevna, Montana-Dakota proposed a reroute that appeared acceptable to the MT Fish, Wildlife and Parks for minimizing impacts to sage grouse leks in the area. The attached map illustrates the reroute, showing an approximate minimum 0.3 mile distance between the proposed transmission line and the leks. There is also a hill between the transmission line and the leks that we believe reduces the ability of raptors to prey on sage grouse at the leks.

We would like to receive concurrence on the proposed reroute of the transmission line from the MT Fish, Wildlife and Parks by March 1. Please call me at (701) 222-7844 if you have any questions or would like to discuss.

Sincerely,

allotha

Abbie S. Krebsbach Environmental Manager

Enclosure

cc: Henry Ford – Montana-Dakota Utilities Co. Transmission Manager Larry Sibbald – TransCanada Craig Jones – MT DEQ Major Facility Siting Program



United States Department of the Interior Fish and Wildlife Service



Ecological Services Montana Field Office 585 Shepard Way, Suite 1 Helena, Montana 59601-6287 Phone: (406) 449-5225 Fax: (406) 449-5339

February 19, 2013

Ms. Abbie Krebsbach Montana-Dakota Utilities Co. 400 North Fourth Street Bismarck, ND 58501

Dear Ms. Krebsbach:

This letter responds to your December 28, 2012 letter, received in our office on January 8, 2013, and your request for U.S. Fish and Wildlife Service (Service) comments on Montana-Dakota Utilities' (MDU) proposed electric service line in connection with the proposed Keystone XL pipeline project Pump Site #14 through Fallon County, Montana. Your letter included a proposed route map; information regarding the proposed line configuration, etc. was not provided. Our response comments are authorized under the Endangered Species Act of 1973 (ESA), as amended (16 U.S.C. 1531 et. seq.), Migratory Bird Treaty Act (MBTA)(16 U.S.C. 703 et seq.), as amended, Executive Order 13186 *Responsibilities of Federal Agencies to Protect Migratory Birds*, Bald and Golden Eagle Protection Act (BGEPA) (16 U.S.C. 668-668d, 54 Stat. 250), as amended, and the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq.*).

We understand that the approximate 6.3 mile-long 115 kV line is proposed to provide power to Keystone XL's proposed Pump Site #14 in Fallon County. The line would cross Pennel Creek. It is also our understanding that this proposed power line is subject to the provisions of the March 30, 2012 Montana Department of Environmental Quality (MDEQ) Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities, including its Attachment 1B (Environmental Stipulations). Our comments and recommendations regarding listed and candidate threatened and endangered species are provided below. Additional recommendations pertaining to eagles and other migratory birds are provided for your consideration in subsequent sections.

Threatened and Endangered Species

The United States Department of State Bureau of Oceans and International Environmental and Scientific Affairs (DOS) completed a Biological Assessment (BA) for the proposed Keystone XL Project on December 21, 2012. General threatened and endangered species conservation measures that could be applied to power line projects proposed in conjunction with the Keystone XL Project were included in the BA. However, determinations as to which specific conservation measures would be applied to which specific proposed power lines were not provided in the BA; such determinations were left to further

consultation between Service Ecological Services Field Offices and proposed power providers in each affected state. Your December 28, 2012 letter stated that MDU will consult with this office on mitigation and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the whooping crane, interior least tern, and piping plover that may occur in specific areas along the proposed power line corridor. We do not anticipate that the interior least tern or piping plover occur in the project area. We further recommend that your consultation include the candidate greater sage-grouse and Sprague's pipit, which were also included in the BA.

In accordance with section 7(c) of the Endangered Species Act, the Service has determined that the following listed and candidate species and designated critical habitat may occur in the general proposed Pump Site #10 power line project region:

Scientific Name	Common Name	Status	Montana Range/Habitat
Grus americana	Whooping Crane	LE	Wetlands; migrant eastern Montana
Centrocercus urophasianus	Greater Sage- Grouse	C	Eastern, central, and southwestern Montana in sagebrush, sagebrush- grasslands, and associated agricultural lands
Anthus spragueii	Sprague's Pipit	С	Grassland habitats with little or no shrub cover east of the Continental Divide

*LE = Listed Endangered; C = Candidate Species

Whooping cranes may occur as rare spring and fall migrants, using suitable stopover habitat in the area. The project occurs within the general breeding range of the Sprague's pipit, although potential Sprague's pipit habitat suitability in the project vicinity is classified as low to not suitable by the Montana Natural Heritage Program (MNHP). Greater sage-grouse also occur in the project area, including leks and general habitat. Based on your maps, it appears that the project would not traverse mapped core habitat. According to Appendix N of the BA, greater sage-grouse leks 1430 (FA-33) and 1485 (FA-44) occur within three miles (approximately 0.4 and 0.3 mile, respectively) of the proposed transmission line route. Based on 2010-2012 surveys and other agency data, Appendix N of the BA concludes that both of these leks are active.

Candidate species are those placed on the candidate list for future action, meaning those species do not receive statutory protection under the ESA. Candidates are reviewed annually by the Service to determine if they continue to warrant listing or to reassess their listing priority. Ideally, sufficient threats can be removed to eliminate the need for listing. If threats are not addressed or the status of the species declines, a candidate species can move up in priority for a listing proposal. Federal agencies and non-federal applicants can conference with the Service pursuant to section 7(a)(4) of ESA to ensure that their actions do not negatively impact candidate species. Some federal agencies provide the same level of protection to candidate species as proposed or listed species and take appropriate measures to avoid impacts. Candidate species are included in the BA, and it is our understanding that the DOS intends to enact this level of protection relative to the Keystone XL project; including ancillary facilities such as this proposed power line.

If a federal agency authorizes, funds, or carries out a proposed action, the responsible federal agency, or its delegated agent, is required to evaluate whether the action "may affect" listed species or critical habitat. If the federal agency or its designated agent determines the action "may affect, is likely to adversely affect" listed species or critical habitat, the responsible federal agency shall request formal section 7 consultation with this office. If the evaluation shows a "may affect, not likely to adversely affect" determination, concurrence from this office is required. If the evaluation shows a "no effect" determination for listed species or critical habitat, further consultation is not necessary. If a private entity receives federal funding for a construction project, or if any federal permit or license is required, the federal agency may designate the fund recipient or permittee as its agent for purposes of informal section 7 consultation. The funding, permitting, or licensing federal agency is responsible to ensure that its actions comply with the ESA, including obtaining concurrence from the Service for any action that may affect a threatened or endangered species or designated critical habitat.

As stated above, the proposed power line project is included in the ESA section 7 consultation (as documented the BA) underway relative to the overall proposed Keystone XL pipeline project. Further, as an "associated facility", the power line is subject to the provisions of the March 30, 2012 MDEQ Environmental Quality Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities, including its Attachment 1B (Environmental Stipulations). Consequently, we expect that all applicable conservation measures identified in the final BA and the Environmental Stipulations will be implemented relative to this proposed power line project.

The following conservation measures are included in the BA and are applicable and recommended relative to this proposed power line project. Repetitive measures (per the BA) are only listed once. Recommended additions or revisions to these measures pertaining to the power line project, as well as other comments, are indicated in italics. Measures in the Environmental Stipulations are not repeated below as they are expected to be implemented for these species where applicable.

Whooping Crane:

- All equipment maintenance and repairs would be performed in upland locations at least 100 feet from waterbodies and wetlands.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible.
- Equipment would not be washed in streams or wetlands.
- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials.
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup.
- Keystone would mark and maintain a 100-foot area from these river crossings, free from hazardous materials, fuel storage, and vehicle fuel transfers.
- Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially

suitable habitat at the discretion of the local Ecological Services Field Office, based on the biological needs of the whooping crane. *Marking is recommended within 0.25 mile of Pennel Creek and all other open water or emergent wetland areas traversed by the route. We recommend marking in compliance with APLIC's <u>Reducing Avian Collisions with Powerlines, The State of the Art in 2012</u>.*

We also recommend the following measure:

 During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, MDU would immediately contact the Service and Montana Fish, Wildlife, and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area.

Greater Sage-Grouse: The BA includes conservation measures that apply to Keystone project features in Montana. However, it is unclear in the BA as to which measures may apply to proposed pump station power line routes. Similar greater sage-grouse measures are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. In addition to the greater sage-grouse measures specified in the Environmental Stipulations, we recommend the following:

- The Service generally recommends that transmission lines not be sited within four miles of leks. Where this is not feasible, power lines should be sited to avoid and minimize encroachment on greater sage-grouse leks and important habitats to the extent possible on a case-by-case basis. As feasible, facilities should: 1) be topographically screened from leks, and; 2) be buried where proposed within sight of leks or traversing important habitats.
- Incorporating the provisions in BA Appendix O and the MDEQ Environmental Stipulations, construction should be prohibited from March 1 to June 15: 1) within three miles of active greater sage-grouse leks: a) not screened by topography, or b) within suitable nesting habitat regardless of screening; and 2) within no closer than one mile of any active lek, with the following exceptions:

a. Equipment may pass as a single group along the permitted right-of-way or approved location though a restricted lek buffer area.

b. Equipment should only pass through a restricted lek buffer between 10:00 am and 2:00 pm, to avoid disturbing displaying birds during critical times of the day.

c. If major grading is required to pass equipment along the permitted right-of-way or approved location, this grading should take place outside of the March 1 through June 15 restriction period.

d. As the equipment passes through the areas, if any large hummocks or rocks impede the travel lane, the lead dozer will lower its blade on the way through to move the obstruction to the side and/or smooth out any larger hummocks or rocks.

- Monitor active leks (displaying males) within three miles of the project during any construction between March 1 and June 15; suspend construction until June 16 if construction-related disturbance is noted.
- Pole and span configurations should be designed to maximize distances between poles and leks.

Sprague's Pipit:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.
- Control unauthorized off-road vehicle access to the construction ROW through the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; or plant conifers or other appropriate trees or shrubs in accordance with landowner or manager request where such plantings would not diminish the quality of adjacent Sprague's pipit habitat.
- Delay construction activity until young have fledged from April 15 to July 15 within 330 feet of discovered active Sprague's pipit nests in eastern Montana.

We also recommend the following measures:

- To the extent feasible, complete construction in native prairie habitats outside of the April 15 to July 15 grassland ground-nesting bird nesting season.
- The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible.

Migratory Birds

The MBTA prohibits the taking, killing, possession, and transportation, (among other actions) of migratory birds, their eggs, parts, and nests, except when specifically permitted by regulations. While the MBTA has no provision for allowing unauthorized take, the Service realizes that some birds may be killed during construction of transmission lines and appurtenant infrastructure and access, even if all known reasonable and effective measures to protect birds are used. The Service's Office of Law Enforcement carries out its mission to protect migratory birds through investigations and enforcement, as well as by fostering relationships with individuals, companies, and industries that have taken effective steps to avoid take of migratory birds and by encouraging others to implement measures to avoid take of migratory birds. It is not possible to absolve individuals, companies, or agencies from liability even if they implement bird mortality avoidance or other similar protective measures. However, the Office of Law Enforcement focuses its resources on investigating and prosecuting individuals and companies that take migratory birds without identifying and implementing all reasonable, prudent and effective measures to avoid that take. Companies are encouraged to work closely with Service biologists to identify available protective measures when developing project plans, avian protection plans (APPs), and bird conservation plans, and to implement those measures prior to/during construction.

Executive Order 13186 expressly requires that Federal agencies evaluate the effects of proposed actions on migratory birds (including eagles) pursuant to NEPA "or other established environmental review process;" restore and enhance the habitat of migratory birds, as practicable; identify where unintentional take reasonably attributable to agency actions has, or is likely to have, a measurable negative effect on migratory bird populations; and, with respect to those actions so identified, the agency shall develop and use principles, standards, and practices that will lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the Service.

To minimize the electrocution and collision hazards to birds, we generally recommend that new power lines be buried where feasible. Where this is not feasible, we recommend that any proposed newly constructed or modified overhead power lines or substations be designed and built to the APLIC standards in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006*. To increase power line visibility and reduce bird fatalities resulting from collisions with power lines, daytime visual markers should be installed on proposed lines within 0.25 mile of Pennel Creek and all other open water or emergent wetland areas traversed by the route, and all other areas as recommended during your coordination with MFWP per techniques outlined in *Mitigating Bird Collisions with Power Lines: The State of the Art in 2012*.

To the maximum extent practicable, project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season. We recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species. If work is proposed to take place during the breeding season or at any other time which may result in take of migratory birds, their eggs, or active nests, the Service recommends that the project proponent take all practicable measures to avoid and minimize take, such as maintaining adequate buffers, to protect the birds until the young have fledged. Active nests may not be removed. The Service further recommends that if field surveys for nesting birds are conducted with the intent of avoiding take during construction, any documentation of the presence of migratory birds, eggs, and active nests, along with information regarding the qualifications of the biologist(s) performing the surveys, and any avoidance measures implemented at the project site be maintained.

Certain activities may require a permit from the Service's Migratory Bird Management Division. Please contact the Region 6 Migratory Bird Permits Office if you are uncertain if activities may result in take of migratory birds, eggs, or nests. Additional information about permits can be found at http://www.fws.gov/migratorybirds/mbpermits.html. Service guidance regarding bird nest destruction can be found at http://www.fws.gov/policy/m0208.pdf.

Bald and Golden Eagles

The BGEPA prohibits anyone, without a permit issued by the Secretary of the Interior, from taking bald or golden eagles, including their parts, nests, or eggs. The BGEPA provides criminal and civil penalties for persons who take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof. The BGEPA defines take as pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. "Disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagles return, such alterations agitate or bother an eagle to a degree that injures an eagle or substantially interferes with normal breeding, or sheltering habits and causes, or is likely to cause, a loss of productivity or nest abandonment.

A permit is required for any legal take of bald or golden eagles or their nests (whether occupied or unoccupied). Limited issuance of permits to take bald and golden eagles can be authorized "for the protection of . . .other interests in any particular locality" where the take is compatible with the

preservation of the bald eagle and the golden eagle, is associated with and not the purpose of an otherwise lawful activity, and cannot practicably be avoided. No one is required to seek a permit for any activity. However, where an activity results in take, it is a violation of BGEPA unless a permit authorizing that take has been obtained prior to the action.

Based on 2013 Montana Natural Heritage Program data, we are not aware of bald or golden eagle nests within a mile of the proposed route. However, as-yet undetected nests may be present. During the nesting season, especially early in the season, eagles can be very sensitive to disturbance near the nest site and may abandon the nest as a result of low-level disturbance, even from foot traffic. Where construction is proposed in proximity to a bald eagle nest, concentrated foraging area, or communal roost site, we recommend that at a minimum, MDU comply with siting recommendations, seasonal restrictions, and distance buffers specified in the 2010 Montana Bald Eagle Management Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994). A nest buffer of at least 0.5 mile should be maintained for bald eagles. The Service's May 2007, National Bald Eagle Management Guidelines contains additional information on protecting bald eagles from disturbance due to human activity. The guidelines can be accessed on the Service's website at: http://www.fws.gov/Migratorybirds //CurrentBirdIssues/Management/BaldEagle/NationalBaldEagleManagementGuidelines.pdf.

The Service has not issued golden eagle management guidelines. However, appropriate buffers for nests and other important use areas based on site-specific conditions should be developed in conjunction with this office if project activities are proposed in proximity to such areas. In Montana, the Service generally recommends avoidance of occupied nest site disturbance between January 1 and August 15. Depending on site-specific conditions, the typically recommended 0.5-mile buffer distance for bald eagle important use areas may be inadequate to ensure avoidance of golden eagle disturbance; larger buffers may be warranted. We therefore recommend avoidance of occupied golden eagle territories where practicable; maximizing distances between nests (including alternate nests) and the siting of proposed project features; avoidance of occupied nest site disturbance during the nesting season; and avoidance / minimization of impacts to important golden eagle habitat (e.g., shrub-steppe and native grasslands) within golden eagle territories.

Whether or not an active bald or golden eagle nest is present, we again recommend implementation of measures to address potential avian electrocution or collision along portions of the route, as discussed above, due to eagle and other potential migratory bird activity in the area.

Other Comments

We strongly recommend continued coordination with MFWP and the MNHP. These agencies may be able to provide updated, site-specific information regarding threatened, endangered, and sensitive species; eagle and other raptor nest locations; and other fish and wildlife resources occurring in the proposed project area.

Construction timing and distance buffers for raptors, sharp-tailed grouse and several other wildlife species are stipulated in Attachment 1B (Environmental Stipulations) of the March 30, 2012 MDEQ Certificate of Compliance under the Major Facility Siting Act for the Montana portion of the Keystone XL Pipeline and associated facilities. We recommend that MDU adhere to these construction timing and distance buffers where applicable. Sensitive resources that should be considered in final siting of all project facilities include threatened, endangered, and candidate species and their habitat, bald and golden eagle and other migratory bird species nesting and habitat; wetlands; ephemeral, intermittent and permanent streams; naturally wooded draws; sagebrush habitat; and native prairie. Additional general recommendations include:

- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels;
- Enact best management practices to avoid and minimize the spread of noxious weeds and other undesirable exotic plant species within the proposed project area;
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.

In conjunction with ESA section 7 consultation process, we request that MDU provide the Service a written response regarding MDU's intent to apply our recommended conservation measures for listed and candidate threatened and endangered species as provided above under **Threatened and Endangered Species**. Also, as stated above, MDU should inform the Service in writing as to any additional potential conservation measures listed in the BA that it intends to enact. We would also appreciate notification as to what recommendations provided above under **Migratory Birds** and **Bald and Golden Eagles** MDU intends to implement.

Thank you for the opportunity to review and comment on this proposed project. Please telephone Jeff Berglund at 406/449-5225, ext. 206, if you have any questions regarding this matter.

Sincerely,

Brent Esmoil Acting Field Supervisor

* MONTANA-DAKOTA UTILITIES CO. A Division of MDU Resources Group, Inc. 400 North Fourth Street

400 North Fourth Street Bismarck, ND 58501 (701) 222-7900

April 24, 2013

Brent Esmoil Acting Field Supervisor US Fish and Wildlife Service Ecological Services – Montana Field Office 585 Shepard Way, Suite 1 Helena, MT 59601-6287

Re: Power Line Serving Keystone XL Pipeline Pump Station #14

Dear Mr. Esmoil:

Montana-Dakota Utilities Co., a Division of MDU Resources Group, Inc. (Montana-Dakota), provides this letter as a response to the February 19, 2013 letter from the United States Department of Interior, Fish and Wildlife Service (USFWS) commenting on the proposed 6.3 mile 115kV transmission line that will provide electric service to Pump Station #14 of the Keystone XL Pipeline Project in Fallon County, Montana. The USFWS requested a written response regarding Montana-Dakota's intent to apply the USFWS recommended conservation measures included in the February 19, 2013 letter. Montana-Dakota has listed the USFWS recommended conservation measures below and explains the company's intent to apply the measures during construction of the transmission line project. Montana-Dakota has expanded on the implementation of some of these measures.

Whooping Crane Measures:

- All equipment maintenance repairs would be performed in upland locations at least 100 feet from water bodies and wetlands. **Response:** Montana-Dakota will apply this measure.
- All equipment would be parked overnight at least 100 feet from a watercourse or wetland, if possible. **Response:** Montana-Dakota will apply this measure.
- Equipment would not be washed in streams or wetlands. <u>Response: Montana-Dakota will apply</u> this measure.
- Construction and restoration activities would be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. <u>Response: Montana-Dakota will apply this measure.</u>
- Each construction crew and cleanup crew would have on hand sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials. **Response:** Montana-Dakota will apply this measure.
- Refueling and lubrication of construction equipment would generally be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible, the equipment would be fueled by designated personnel with special training in refueling, spill containment, and cleanup. Response: Montana-Dakota will apply this measure.

- Keystone would mark and maintain a 100-foot area from these river crossing, free from hazardous materials, fuel storage, and vehicle fuel transfers. <u>Response: Montana-Dakota will apply this measure.</u>
- Outside the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat at the discretion of the local Ecological Service Field Office, based on the biological needs of the whooping crane. *Marking is recommended within 0.25 mile Pennel Creek and all other open water or emergent wetland areas traversed by the route. We recommend marking in compliance with APLIC's <u>Reducing Avian Collisions with Powerlines, The State of the Art 2012</u>.
 <u>Response: Montana-Dakota will apply this measure by marking appropriate sections of the topmost transmission or static line with swan flight diverters at a spacing of approximately 50 feet. Montana-Dakota has identified line markers to be installed within 0.25 mile of Pennel Creek and within 0.25 mile of the pond in the northwest corner of Section 35, Township 9 North, Range 58 East. See attached Figure: Swan Flight Diverter Location on Proposed TransCanada Tap 115KV, TL085-2 Route for the transmission line route and marking locations.* </u>
- (Recommended) During construction, if whooping cranes are sighted during spring (approximately April through May) or fall (approximately September through October) migration periods, MDU would immediately contact the Service and MT Fish Wildlife and Parks (MFWP) for further instruction and require that all human activity and equipment start-up be delayed. Work could proceed if whooping crane(s) leave the area. Response: Montana-Dakota will apply this measure. If a whooping crane is sighted on the ground within the transmission line project area during construction, Montana-Dakota will cease construction and contact the USFWS.

Greater Sage-Grouse Measures:

- The Service generally recommends that transmission lines not be sited within four miles of leks. Where this is not feasible, power lines should be sited to avoid and minimize encroachment on greater sage-grouse leks and important habitats to the extent possible on a case-by-case basis. As feasible, facilities should: 1) be topographically screened from leks, and 2) be buried where proposed within sight of leks or traversing important habitats. **Response:** Montana-Dakota will apply this measure as follows: Montana-Dakota met with a representative of the Montana Fish Wildlife and Parks (MTFWP) on June 21, 2011 to identify an acceptable reroute of a portion of proposed transmission line that will serve Pump Station #14. There were two leks identified near the original route of the transmission line. Montana-Dakota and MTFWP agreed on a reroute that minimized encroachment and impact to the sage grouse leks. Views of transmission structures from lekking grouse would be limited by topography and distance. Also, Montana-Dakota will install perch discouragers on the structures as requested by MTFWP to minimize raptor use of structures to prey on sage grouse. A map showing the reroute is attached, including the prior correspondence and approval of the reroute from MTFWP.
- Incorporating the provisions in BA Appendix O and MDEQ Environmental Stipulations, construction should be prohibited from March 1 to June 15: 1) within three miles of active greater sage-grouse leks: a) not screened by topography, or b) within suitable nesting habitat regardless of screening; and 2) within no closer than one mile of any active lek, with the following exceptions:

a. Equipment may pass as a single group along the permitted right-of-way or approved location through a restricted lek buffer area.

b. Equipment should only pass through a restricted lek buffer between 10:00am and 2:00pm, to avoid disturbing displaying birds during critical times of the day.

c. If major grading is required to pass equipment along the permitted right-of-way or approved location, this grading should take place outside of the March 1 through June 15 restriction period.

d. As the equipment passes through the areas, if any large hummocks or rocks impeded the travel lane, the lead dozer will lower its blade on the way through to move the obstruction to the side and/or smooth out any larger hummocks or rocks. Response: Montana-Dakota will work with TransCanada to avoid any construction of the electric transmission line from March 1 to June 15, however, the most recent communication from TransCanada is that electric service is requested to be available for Pump Station #14 by July 2014. Depending on final approval received by TransCanada to construct the Keystone XL pipeline project, Montana-Dakota may not be able to avoid constructing the transmission line in the March 1 to June 15 time period. If construction is projected to occur during the period of March 1 to June 15 within three miles of active greater sage-grouse leks that are not screened by topography or that are within suitable nesting habitat regardless of screening, Montana-Dakota proposes the following alternative: Montana-Dakota would minimize disturbance to lekking sage grouse by avoiding construction within 1 mile of leks from 8 pm until 2 hours after sunrise the following day on a daily basis and monitor active leks (displaying males) within three miles of the project during construction between March 1 and June 15. Montana-Dakota would contact the USFWS to obtain additional guidance if construction-related disturbance of lekking sage grouse is noted.

- Monitor active leks (displaying males) within three miles of the project during any construction between March 1 and June 15; suspend construction until June 16 if construction-related disturbance is noted. Response: See response directly above. If construction is projected to occur within March 1 and June 15, Montana-Dakota will monitor the active leks and contact USFWS to obtain additional guidance if construction-related disturbance is noted.
- Pole and span configurations should be designed to maximize distances between poles and leks.
 Response: Montana-Dakota will apply this measure. Pole spacing is approximately 350 feet. The nearest distance from a lek to the transmission line or a pole is 0.3 miles.

Sprague's Pipit Measures:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement. <u>Response:</u> <u>Montana-Dakota will apply this measure per *MDEQ Environmental Stipulations* Appendix A which stipulates using a locally adapted sagebrush seed for reclamation in sage grouse habitat and a native prairie seed mix as applicable, unless landowner requests differently.
 </u>
- Controls unauthorized off-road vehicle access to the construction ROW through the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, or boulders lined across the construction ROW; or plant conifers of other appropriate trees or shrubs in accordance with landowner or manager request *where such planting would not diminish the quality of adjacent Sprague's pipit habitat*. **Response:** Montana-Dakota will apply this measure as approved by the landowner.
- Delay construction activity *until young have fledged from <u>April 15 to July 15</u> within 330 feet of discovered active Sprague's pipit nests in eastern Montana. <u>Response: Montana-Dakota will apply</u> this measure by mowing the right-of-way (ROW), unless landowner does not approve mowing, or*

Montana-Dakota will follow requirements identified in any potential pipeline project-wide alternative obtained by TransCanada and approved by USFWS for disturbance of migratory birds and nesting. Any mowing will be completed in the fall, prior to construction, to discourage bird nesting. Montana-Dakota may determine not to mow the ROW if construction is projected to commence after July 15. Montana-Dakota will not mow sagebrush.

- Also recommend:
 - To the extent feasible, complete construction in native prairie habitats outside of the April 15 to July 15 grassland ground-nesting bird nesting season. Response: Montana-Dakota will work with TransCanada to avoid any construction of the electric transmission line from April 15 to July 15, however, the most recent communication from TransCanada is that electric service is requested to be available for Pump Station #14 by July 2014. Depending on final approval received by TransCanada to construct the Keystone XL pipeline project, Montana-Dakota may not be able to avoid constructing the transmission line in the April 15 to July 15 time period. If construction is projected to occur in native prairie habitat during the period of April 15 to July 15, Montana-Dakota will mow the ROW, unless landowner does not approve mowing, or Montana-Dakota will follow requirements identified in any potential pipeline project-wide alternative obtained by TransCanada and approved by USFWS for disturbance of migratory birds and nesting. Any mowing will be completed in the fall, prior to construction is projected to commence after July 15. Montana-Dakota will not mow sagebrush.
 - The power line should be sited to avoid and minimize encroachment on native prairie habitats as feasible. Response: Montana-Dakota has sited the power line to avoid and minimize encroachment on native prairie habitats as feasible. Montana-Dakota will use single pole structures and utilize temporary access roads instead of constructing permanent access roads that may fragment habitat. Further, permanent impacts of this transmission line are minimal, projected to be a total of approximately 500 square feet (4 square feet per pole).

MBTA Measures:

- Build structures to APLIC Standards:
 - Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006.
 Response: Montana-Dakota will apply this measure.
 - <u>Mitigating Bird Collisions with Power Lines: The State of the Art in 2012</u>. Response: Montana-Dakota will apply marking for the whooping crane as described above.
 - Project construction should be scheduled so as not to disrupt nesting raptors or other migratory birds during the breeding season.
 - Recommend implementation of at least a 0.5-mile buffer between occupied nests and construction activities during the breeding season for most raptor species.
 Response: See response below for mowing ROW.
 - Recommend that the MDU maintain adequate buffers to protect the birds until the young have fledged. Maintain documents for any nest surveys and avoidance measures. Response: See response below for mowing ROW.
 - Mowing the right-of-way before the nesting/breeding season would reduce this concern. Response: Montana-Dakota will apply this measure, unless landowner
does not approve mowing, or Montana-Dakota will follow requirements identified in any potential pipeline project-wide alternative obtained by TransCanada and approved by USFWS for disturbance of migratory birds and nesting. Any mowing will be completed in the fall, prior to construction, to discourage bird nesting. Montana-Dakota may determine not to mow the ROW if construction is projected to commence after July 15. Montana-Dakota will not mow sagebrush.

BGEPA Measures:

- DOI is not aware of any bald or golden eagle nests within a mile of the project. <u>Response:</u> <u>TransCanada's consultant, exp Energy Services Inc., coordinated surveys that confirmed no eagle,</u> <u>hawk or owl nests were found near this transmission line route.</u>
- Follow seasonal restrictions and distance buffers in <u>2010 Montana Bald Eagle Management</u> <u>Guidelines: An Addendum to Montana Bald Eagle Management Plan (1994)</u>. Response: See response above.
- Avoidance of nests between January 1 and August 15. Response: See response above.

General Recommendations:

- Install and maintain appropriate erosion control measures to reduce sediment transport to adjacent wetlands and stream channels; **Response:** Montana-Dakota will apply this measure.
- Enact best management practices to avoid and minimize the spread of noxious weeds and other
 undesirable exotic plant species within the proposed project area; Response: Montana-Dakota will
 apply this measure per MDEQ Environmental Stipulations Appendix A which stipulates using a
 locally adapted sagebrush seed for reclamation in sage grouse habitat and a native prairie seed mix
 as applicable to reduce noxious weeds, unless landowner requests differently. Minimal soil
 disturbance will result from the transmission project. Montana-Dakota will work with landowners
 to determine a seed mix that minimizes the introduction of undesirable exotic plant species.
- Confine the disturbed area along proposed ROWs as narrow as possible, especially in or near sensitive resources such as native prairie, sagebrush habitat, wooded draws, wetlands, and streams; and <u>Response: Montana-Dakota will apply this measure</u>. Minimal soil disturbance will result from the transmission project.
- Revegetate disturbed areas with appropriate native species obtained from local sources, as possible.
 Response: Montana-Dakota will apply this measure per MDEQ Environmental Stipulations
 Appendix A which stipulates using a locally adapted sagebrush seed for reclamation in sage grouse
 habitat and a native prairie seed mix as applicable, unless landowner requests differently.

If you have any questions or would like to discuss the responses above, please contact me at 701-222-7844.

Sincerely,

REED

Abbie Krebsbach Director of Environmental



Grand Electric Cooperative, Inc.

801 Coleman Ave. P. O. Box 39 **Bison, SD 57620**

January 10, 2013

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

> Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Grand Electric Cooperative, Inc., a power provider located in Bison, SD, is providing electric service to Pump Stations 15 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed is a map showing the location and route of the power line we intend to permit and build to service the Keystone XL Project, Pump Station 15. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

incerely, Reisenauer, General Manager JR:gj

Enclosures





Grand Electric Cooperative, Inc.

801 Coleman Ave. P. O. Box 39 Bison, SD 57620

January 10, 2013

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Grand Electric Cooperative, Inc., a power provider located in Bison, SD, is providing electric service to Pump Stations 16 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed is a map showing the location and route of the power line we intend to permit and build to service the Keystone XL Project, Pump Station 16. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sinderely, Reisenauer! General Manager JR:gj

Enclosures



Grand Electric Cooperative, Inc.

801 Coleman Ave. P. O. Box 39 Bison, SD 57620

January 10, 2013

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Grand Electric Cooperative, Inc., a power provider located in Bison, SD, is providing electric service to Pump Stations 17 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed is a map showing the location and route of the power line we intend to permit and build to service the Keystone XL Project, Pump Station 17. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely, Reisenauer, General Manager φfy

JR:gj

Enclosures



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services 420 South Garfield Avenue, Suite 400 Pierre, South Dakota 57501-5408

January 24, 2013



Jerry Reisenauer, General Manager Grand Electric Cooperative, Inc. 801 Coleman Avenue P.O. Box 39 Bison, South Dakota 57620

> Re: Transmission Lines for Pumping Stations 15, 16, and 17 Along the Keystone XL Pipeline in Harding, Perkins, and Meade Counties in South Dakota

Dear Mr. Reisenauer:

This letter is in response to your request dated January 10, 2013, for environmental comments regarding the above referenced project involving the construction of new transmission lines to provide electric service to Keystone XL pumping station 15 in Harding County, pumping station 16 in Harding and Perkins Counties, and pumping station 17 in Meade County, South Dakota.

In our February 8, 2011, correspondence, our main concern was expressed for greater sage grouse, a candidate species, and game species in South Dakota. Since that time, several meetings and conversations have occurred with Keystone staff, South Dakota Department of Game, Fish and Parks (SDDGFP) staff, and U.S. Fish and Wildlife Service (Service) staff. We feel that the best conservation measures have been summarized in the November 4, 2011, letter to the SDDGFP from Richard Fristik, Rural Utilities Service, as follows:

Proposed Conservation/Mitigation Measures

We agree with the approach that both "active" and "inactive" leks should be treated similarly in assessing potential impacts. Lines will be constructed in existing ROWs, and there would be limited if any vegetation clearance; although some of the rebuild portions of the proposals will replace overhead with underground line, it is not feasible to bury the new transmission lines due to cost, operational considerations, and RUS regulations. Although possible, we do not foresee collision being a major threat to grouse. We believe that perch deterrents would be warranted and potentially useful for those pole locations that are one mile or less from a lek. Cones or spike-type deterrent devices seem to be most effective, but all deterrents are limited in their effectiveness, although time spent perching may be reduced (Lammers and Collopy 2007; Prather and Messmer 2010). The design of the proposed lines (i.e., armless, with insulators mounted directly to the poles) may also present challenges in affixing deterrents. While the proposed line routes are relatively final, we will work with GEC to consider adjustments to avoid priority grouse leks. We will also adhere to the extent possible to your recommended seasonal construction windows (March 1 - July 15), but please recognize that construction schedules will be largely driven by that of the pipeline.

The Service appreciates the opportunity to provide comments. If you have any questions regarding these comments, please contact Charlene Bessken of this office at (605) 224-8693, Extension 231.

Sincerely,

Scottanon

Scott V. Larson Field Supervisor South Dakota Field Office

cc: FWS/ES; Grand Island, NE (Attention: Robert Harms) Secretary/SDDGFP; Pierre, SD (Attention: Tom Kirschenmann)



PO Box 17 204 Main St. Murdo SD 57559

Phone (605) 669-2472 or 1-800-242-9232 Fax (605) 669-2358 Email wcec@wce.coop

December 18, 2012

John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

West Central Electric Cooperative, Inc., a power provider located in Murdo, South Dakota, is providing electric service to Pump Stations 18 and 19 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

WEST CENTRAL ELECTRIC CO-OP., INC.

Steven J. Reed CEO/Manager

SJR:bm

Enc.

-MANAGEMENT STAFF



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services 420 South Garfield Avenue, Suite 400 Pierre, South Dakota 57501-5408



January 24, 2013

Mr. Kit Talich, Engineer West Central Electric Cooperative, Inc. 204 Main Street P.O. Box 17 Murdo, South Dakota 57559

> Re: Transmission Lines for Pumping Stations 17, 18, and 19 Along the Keystone XL Pipeline in Haakon, Jones, and Meade Counties in South Dakota

Dear Mr. Talich:

This letter is in response to your request dated December 31, 2012, for environmental comments regarding the above referenced project involving the construction of new 115 kV transmission lines to provide service to Keystone XL pumping station 17 in Meade County, pumping station 18 in Haakon County, and pumping station 19 in Jones County, South Dakota.

As discussed in previous conversations and correspondence, these transmission lines are on the outer edges of the whooping crane migration corridors and few wetlands exist near the pumping stations that would attract whooping cranes. This project, as described, will have no significant impact on fish and wildlife resources. It does not involve any federally listed threatened or endangered species or their habitats.

The Federal action agency or their designated representative should consider a "may affect - not likely to adversely affect" determination for this project per section 7 of the Endangered Species Act.

The U.S. Fish and Wildlife Service appreciates the opportunity to provide comments. If you have any questions regarding these comments, please contact Charlene Bessken of this office at (605) 224-8693, Extension 231.

Sincerely,

ti Larson

Scott V. Larson Field Supervisor South Dakota Field Office

cc: FWS/ES; Grand Island, NE (Attention: Robert Harms)

Robert Harms

From: Sent: To: Subject: Bessken, Charlene Monday, February 25, 2013 8:50 AM Robert Harms Keystone XL - pump stations

Just missed your call.

For clarification, pump stations No. 17 will be serviced for electric power by Grand Electric.

There was a typo in the letter for West Central - this pump station is NOT in there service territory.

Sorry

Charlene "Charlie" Bessken TWS Certified Wildlife Biologist Fish and Wildlife Biologist USFWS South Dakota Field Office 420 South Garfield Avenue, Suite 400 Pierre, SD 57501 (605) 224-8693 ext. 231 Fax (605) 224-9974 www.fws.gov/southdakotafieldoffice



ROSEBUD ELECTRIC cooperative, incorporated

P.O. Box 439 512 RoseBud Avenue Gregory, SD 57533 PHONE: 605-835-9624 TOLL FREE: 1-888-464-9304 FAX: 605-835-9649 EMAIL: rosebudelectric.com

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Power Lines Serving Keystone XL Pipeline Pump Stations

Dear Mr. Cochnar:

Rosebud Electric, a rural electric cooperative located in Gregory SD, is providing electric service to Pump Station 20 and 21 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, for which TransCanada filed a Presidential Permit application on May 4, 2012, we understand certain impacts associated with the power lines being constructed by all power providers have to be reviewed and approved by the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act.

As such, we agree that we will consult with your office on mitigative and protective measures that can be incorporated into the design of the power line facilities in order to minimize impacts to the Whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors.

Enclosed are proposed maps of the power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

Gary Clayton, Manager Rosebud Electric Cooperative Inc.



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services 420 South Garfield Avenue, Suite 400 Pierre, South Dakota 57501-5408

January 24, 2013



Re: Transmission Lines for Pumping Stations 20 and 21 Along the Keystone XL Pipeline in Tripp and Gregory Counties, South Dakota

Dear Mr. Clayton:

This letter is in response to your request received in our office on December 31, 2012, for environmental comments regarding the above referenced project involving the construction of new transmission lines to provide electric service to Keystone XL pumping station 20 in Tripp County and pumping station 21 in Gregory County, South Dakota.

In our November 16, 2010, correspondence, we noted that these transmission lines "are unlikely to disturb American burying beetles, piping plovers, or least terns in South Dakota."

We went on to state that "whooping cranes have been documented as colliding with transmission lines during spring and fall migration" and that "Tripp and Gregory Counties are both in the center band of the whooping crane migration corridor in which 75 percent of confirmed sightings have occurred." Charlene Bessken of our staff provided a map with some highlighted areas that were likely potential suitable habitat areas that whooping cranes might use. We recommended marking the lines in and around those areas. To complete the section7 review of this project, please let us know if you will be marking these lines or providing other efforts to avoid, minimize, or mitigate impacts to whooping cranes.

The Federal action agency or their designated representative should consider a "may affect - not likely to adversely affect" determination for this project per section 7 of the Endangered Species Act.



The U.S. Fish and Wildlife Service appreciates the opportunity to provide comments. If you have any questions regarding these comments, please contact Charlene Bessken of this office at (605) 224-8693, Extension 231.

Sincerely,

theron

Scott V. Larson Field Supervisor South Dakota Field Office

cc: FWS/ES; Grand Island, NE (Attention: Robert Harms)

File: ENV705.1212, 1214, 1215



Nebraska Public Power District

Always there when you need us

December 27, 2012

Nebraska Game and Parks Commission Attn: Michelle Koch Nebraska Game and Parks Commission 2200 N. 33rd Street P.O. Box 30370 Lincoln, NE 68503-0370

Re: Nebraska Public Power District Transmission Lines (Keystone XL Pipeline Pump Stations #22, #23, and #24)

Dear Ms. Koch:

It is Nebraska Public Power District's (NPPD) understanding that as a result of recent conversations between the US Fish and Wildlife Service (USFWS) and TransCanada that each power provider associated with the Keystone XL Project is being asked to provide USFWS with a letter indicating the willingness of power providers to work with USFWS regarding threatened and endangered species.

Nebraska Public Power District (NPPD) is a supplier of retail and wholesale electric service in Nebraska. Pump stations associated with the Keystone XL Project will require electric service and will represent significant electric loads to the local electric service provider. While NPPD will not be providing electric service directly to these pump stations at a retail level, NPPD will provide electric service to NPPD wholesale customers, who in turn will provide electric service to the pump stations. In order for the wholesale customers to provide reliable electric service to Keystone XL Pump Stations #22, #23, and #24, NPPD must construct additional 115 kV transmission lines. Accordingly, NPPD will establish three separate 115 kV transmission line projects, one to each of the three pump stations.

NPPD follows a very structured route identification and selection process with an emphasis on public involvement, including coordination with various agencies that may have jurisdiction in the line route study areas. Such agencies include the USFWS, as well as the Nebraska Game and Parks Commission (NGPC). For these projects, NPPD is committed to continue coordination with both agencies regarding measures that may need to be incorporated into route selection, engineering/design and construction of the transmission lines to address potential impacts to threatened and endangered species that may occur in certain specific areas.

General Office 1414 15th Street / PO Box 499 / Columbus, NE 68602-0499 Telephone: (402) 564-8561 / Fax: (402) 563-5527 www.nppd.com Once pump station locations and tie-in locations into NPPD's transmission system have been finalized, it is NPPD's plan to contact the USFWS and the NGPC to begin coordination efforts.

Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr. Environmental Manager

Attachments

- Cc: Robert Harms (USFWS) Don Veseth (NPPD)
- Bc: Jedd Fischer (NPPD) Larry Linder (NPPD) Lynn Askew (POWER Engineers) Mike Tatterson (POWER Engineers)

File: ENV705.1212,1214,1215



Nebraska Public Power District Always there when you need us

December 27, 2012

Mr. Michael D. George Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Nebraska Public Power District Transmission Lines (Keystone XL Pipeline Pump Stations #22, #23, and #24)

Dear Mr. George:

It is Nebraska Public Power District's (NPPD) understanding that as a result of recent conversations between the US Fish and Wildlife Service (USFWS) and TransCanada that each power provider associated with the Keystone XL Project is being asked to provide USFWS with a letter indicating the willingness of power providers to work with USFWS regarding threatened and endangered species.

Nebraska Public Power District (NPPD) is a supplier of retail and wholesale electric service in Nebraska. Pump stations associated with the Keystone XL Project will require electric service and will represent significant electric loads to the local electric service provider. While NPPD will not be providing electric service directly to these pump stations at a retail level, NPPD will provide electric service to NPPD wholesale customers, who in turn will provide electric service to the pump stations. In order for the wholesale customers to provide reliable electric service to Keystone XL Pump Stations #22, #23, and #24, NPPD must construct additional 115 kV transmission lines. Accordingly, NPPD will establish three separate 115 kV transmission line projects, one to each of the three pump stations.

NPPD follows a very structured route identification and selection process with an emphasis on public involvement, including coordination with various agencies that may have jurisdiction in the line route study areas. Such agencies include the USFWS, as well as the Nebraska Game and Parks Commission (NGPC). For these projects, NPPD is committed to continue coordination with both agencies regarding measures that may need to be incorporated into route selection, engineering/design and construction of the transmission lines to address potential impacts to threatened and endangered species that may occur in certain specific areas.

General Office 1414 15th Street / PO Box 499 / Columbus, NE 68602-0499 Telephone: (402) 564-8561 / Fax: (402) 563-5527 www.nppd.com Once pump station locations and tie-in locations into NPPD's transmission system have been finalized, it is NPPD's plan to contact the USFWS and the NGPC to begin coordination efforts.

Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr. Environmental Manager

Attachments

- Cc: Robert Harms (USFWS) Michelle Koch (NGPC) Don Veseth (NPPD)
- Bc: Jedd Fischer (NPPD) Larry Linder (NPPD) Lynn Askew (POWER Engineers) Mike Tatterson (POWER Engineers)



File: ENV705.1212, 1214, 1215

Nebraska Public Power District Always there when you need us

March 4, 2013

US Fish & Wildlife Service Attn: Robert Harms US Fish & Wildlife Service Nebraska Field Office 203 West Second Street Federal Building, Second Floor Grand Island, NE 68801

Re: NPPD Keystone XL T&E Species Request Response

Dear Mr. Harms:

In December 2012, power providers were asked to provide a letter indicating their willingness to work with the U.S. Fish and Wildlife Service (USFWS) regarding threatened and endangered species. Per this request, Nebraska Public Power District (NPPD) provided a letter to USFWS dated December 27, 2012 (Attachment A). It is NPPD's understanding that as a result of recent conversations between the USFWS, the U.S. Department of State and TransCanada that each power provider associated with the Keystone XL Project is now being asked to provide USFWS with additional information related to transmission lines that may be constructed to service the pipeline pump stations.

a) Project Actions:

NPPD is a supplier of retail and wholesale electric service in Nebraska. Pump stations associated with the Keystone XL Project will require electric service and will represent significant electric loads to the local electric service provider. While NPPD will not be providing electric service directly to these pump stations at a retail level, NPPD will provide electric service to NPPD wholesale customers, who in turn will provide electric service to the pump stations. In order for the wholesale customers to provide reliable electric service to Keystone XL Pump Stations #22, #23, #24 and #26, NPPD must construct additional 115 kV transmission lines. Accordingly, NPPD will establish four separate 115 kV transmission line projects, one to each of the four pump stations.

General Office 1414 15th Street / PO Box 499 / Columbus, NE 68602-0499 Telephone: (402) 564-8561 / Fax: (402) 563-5527 www.nppd.com NPPD follows a very structured route identification and selection process with an emphasis on public involvement, including coordination with various agencies that may have jurisdiction in the line route study areas. Such agencies include the USFWS, as well as the Nebraska Game and Parks Commission (NGPC). For these projects, NPPD is committed to continue coordination with both the USFWS and NGPC regarding possible measures that may need to be incorporated into route selection, engineering/design and construction of the transmission lines to address potential impacts to threatened and endangered (T&E) species that may occur in certain specific areas. Potential impacts or effects on T&E Species or Critical Habitat are specifically included as part of the NPPD line routing evaluation criteria. This same established process will be utilized by NPPD for these transmission line projects related to Pump Stations #22, #23, #24 and #26.

NPPD must also submit an application to the Nebraska Power Review Board (PRB) for transmission projects. The PRB has a responsibility to approve the need for transmission projects including a determination that proposed projects do not conflict with transmission systems of other utilities or represent an unnecessary duplication of facilities. The PRB does not specifically have transmission line routing authority. As a state agency however, the PRB must by statute consult with the NGPC for each transmission line project for a determination of potential impacts of transmission projects on T&E species.

b) Project Areas:

TransCanada has provided information to NPPD that generally indicates Keystone XL Pump Stations #22 (Holt County), #23 (Antelope County), #24 (Nance/Merrick Counties) and #26 (Jefferson County) are proposed to be located as follows:

Pump Station #22 – approximately 8 miles north and 4 miles west of O'Neill, Nebraska Pump Station #23 – approximately 2 miles north and 5 miles east of Neligh, Nebraska Pump Station #24 – approximately 11 miles north and 2 miles west of Clarks, Nebraska Pump Station #26 – approximately 1 ¹/₂ miles east of Steele City, Nebraska

It is NPPD's understanding that while TransCanada has identified specific parcels of property for pump station locations #22, #23, and #24, the parcels have not been purchased, therefore the pump locations have not been finalized. Pump Station #26 will be built on property already owned by TransCanada, immediately adjacent to the existing pump station previously built for the original Keystone Pipeline. NPPD has reviewed the proposed pump station locations and completed an initial system review to determine the capabilities of NPPD-owned transmission lines in each area to determine possible interconnection locations for the new required 115 kV transmission lines. For each location, existing 115 kV transmission lines are present within relatively close proximity. This close proximity to existing transmission lines will result in the need to construct

relatively short segments of new transmission line from the existing lines to the pump station locations. Approximate length of these new segments is as follows:

Pump Station #22 – approximately 4 miles of new 115 kV transmission line Pump Station #23 – approximately 4 miles of new 115 kV transmission line Pump Station #24 – approximately 15 miles of new 115 kV transmission line Pump Station #26 – approximately 300 feet of new 115 kV transmission line (one span)

The areas in which the four 115 kV lines would be constructed consist primarily of agricultural properties with a mix of irrigated and dryland operations (corn, soybeans, alfalfa), as well as pasture areas. The transmission line for Pump Station #24 near Clarks will need to cross the Platte River as well as wet meadow areas associated with smaller creeks and streams that drain to either the Platte or Loup Rivers.

c) Species and/or Critical Habitat:

The following federal and state-listed T&E species were identified and considered for the counties where the proposed transmission lines are likely to be built for Pump Stations #22, #23, #24 and #26 include:

Holt County (Pump Station #22)

American Burying Beetle (*Nicrophorus americanus*) (FE, SE)* Interior Least Tern (*Sternula antillarum athalassos*) (FE, SE) Piping Plover (*Charadrius melodus*) (FT, ST) River Otter (*Lontra canadensis*) (ST) Small White Lady's Slipper (*Cypripedium candidum*) (ST) Western Prairie Fringed Orchid (*Platanthera praeclara*) (FT, ST) Whooping Crane (*Grus americana*) (FE, SE)

Antelope County (Pump Station #23)

River Otter (ST) Small White Lady's Slipper (ST) Western Prairie Fringed Orchid (FT, ST) Whooping Crane (FE, SE)

Merrick County (Pump Station #24)

Finescale Dace (*Phoxinus neogaeus*) (ST) Interior Least Tern (FE, SE) Piping Plover (FT, ST) River Otter (ST) Small White Lady's Slipper (ST) Whooping Crane (FE, SE)

Nance County (Pump Station #24)

Finescale Dace (ST) Interior Least Tern (FE, SE) Piping Plover (FT, ST) River Otter (ST) Small White Lady's Slipper (ST) Whooping Crane (FE, SE)

Jefferson County (Pump Station #26)

Massasauga (*Sistrurus catenatus*) (ST) Whooping Crane (FE, SE)

*FE = Federal Endangered; SE = State Endangered; FT = Federal Threatened; ST = State Threatened

d) Species and/or Critical Habitat Effects

While the actual effects cannot be completely evaluated or determined until specific line routes are identified, NPPD has worked in these geographical areas in the past and has a good understanding of species that may be present, potential impacts of transmission lines and practices to consider that may avoid or minimize potential impacts.

In order to provide a response to this letter, NPPD coordinated with the USFWS and the NGPC to complete a review for the identified T&E species for the general geographical area where these lines would be expected to be routed. This effort included a desktop review of aerial photography, other readily available data and information and discussions with the USFWS and NGPC about information the agencies have available related to the identified species. This review was completed at a meeting on February 19, 2013.

Based on information available and implementation of the agreed upon actions identified below, it was agreed that these projects will not represent a significant negative impact on any of the identified T&E Species.

It was also agreed that, while there may be areas with possible "suitable" habitat for some of the identified species in the proximity of the project areas, "federally designated critical habitat" for the identified species is not present. Therefore, there will be no impact to any "federally designated critical habitat."

e) Relevant Reports/Commitments

NPPD agrees to the following specific actions related to specific species based on discussions between USFWS, NGPC and NPPD on February 19, 2013. As potential

impacts cannot be fully evaluated until fine line routes are known, NPPD agrees to continued coordination with both the USFWS and NGPC as these projects progress.

<u>Black-Footed Ferret</u> - Black-footed ferret (*Mustela nigripes*) is not identified for any of the project counties. Based on this information, it was agreed that further evaluation of potential impacts to this species is not required.

<u>Pallid Sturgeon</u> - Pallid sturgeon (*Scaphirhynchus albus*) is not identified for any of the project counties. Based on this information, it was agreed that further evaluation of potential impacts to this species is not required.

<u>Finescale Dace</u> – According to the most recent T&E species range maps as published by the NGPC, none of the four areas proposed for construction of transmission lines in Nebraska for Pump Stations #22, #23, #24 and #26 are within the range of the finescale dace. Based on this most recent information, it was agreed that further evaluation of potential impacts to this species is not required.

<u>Massasauga</u>– Of the four proposed transmission project areas, the only area that may have suitable habitat for massasauga is the area in the vicinity of Pump Station #26. Considering the short span (less than 300 feet) of 115 kV transmission line that must be built by NPPD at this location and the fact that the immediate vicinity has been previously developed for the existing pump station, it was agreed that the project is unlikely to adversely impact this species. If massasauga are encountered during construction, they will not be harmed or destroyed unless they pose an eminent threat to human life.

<u>American Burying Beetle</u> – A significant portion of the geographic areas to be considered for construction of the proposed transmission lines consist of cultivated agricultural properties. It was agreed that suitable habitat areas for American burying beetle (ABB) are not present within the general geographic transmission line areas associated with Pump Stations #23, #24 and #26. Based on this information, it is agreed that further evaluation of potential impacts to ABB for these project areas is not required.

For the general geographic transmission line area associated with Pump Station #22, it was agreed that suitable ABB habitat may be present, but is extremely limited due to the prevalence of cultivated agricultural properties as evidenced by the number of center pivots. Data associated with recent presence/absence surveys completed in the immediate vicinity of Pump Station #22 by TransCanada along the pipeline route does indicate that while ABB habitat may be limited, ABB were present in the area on a limited basis. Based on this information, it is agreed that any potential impact to ABB resulting from construction of the transmission line would be slight. In order to avoid and minimize any potential impact, NPPD agrees to:

- Schedule substation and line construction activities for this line segment during the ABB dormant or inactive period (September 15 to April 1).
- Coordinate with USFWS and NGPC to determine appropriate measures to minimize potential impacts if such scheduling cannot be accomplished due to unexpected circumstances such as weather delays.

<u>Whooping Crane</u> – Habitat that may be suitable as roosting, feeding, or loafing areas for whooping cranes is generally present in the geographic areas where transmission lines may be sited for Pump Stations #22, #23, #24 and #26.. Once final line routes are determined, NPPD agrees to:

- Complete a field review with the USFWS and NGPC to determine if any areas are present with a higher probability of whooping crane use (i.e., wetlands or large ponded areas (stock ponds), meadows, and obvious flight corridors to and from such areas to feeding habitats).
- Install spiral bird flight diverters, consistent with APLIC standards, in appropriate areas as identified during the field review.
- Complete daily presence/absence whooping crane surveys according to protocol if construction occurs during the spring or fall migration periods in areas where such surveys are agreed to be appropriate and necessary to avoid disturbance. Should a whooping crane(s) be sighted within ½ mile of a work area, all work would cease until the whooping crane(s) leave that immediate area. The USFWS and NGPC would be contacted immediately and notified of the presence of whooping crane(s).

Interior Least Tern and Piping Plover – It was agreed that habitat areas for interior least terns and piping plovers are not present within the general geographic transmission line areas associated with pump stations #22, #23 and #26. The crossing of the Platte River south of Clarks, Nebraska for Pump Station #24 represents the only area that has the potential for impacts on interior least tern or piping plover. NPPD completed nest surveys in this area in 2011 before the pipeline project was halted for re-route considerations. At that time, no suitable nesting habitat was present within 1/4 mile upstream or downstream of the proposed river crossing location. Understanding that the Platte River is dynamic and continuously changing, NPPD agrees to:

- Complete nest surveys for interior least terns and piping plovers within an area 1/4 mile upstream and downstream of the proposed river crossing location if construction is expected to take place during the nesting period.
- Halt construction if active nests are identified within ¹/₄ mile of the Platte River crossing area until such time that chicks and adults leave the nesting area.
- Install spiral bird flight diverters on the shield wire on the line span between the banks at the Platte River crossing and one span on each side of the crossing.

<u>Western Prairie Fringed Orchid and Small White Lady's Slipper</u> – It was agreed that the geographic area for the transmission line segment associated with Pump Station #26 is outside of the range of both the western prairie fringed orchid and the small white lady's slipper and that further evaluation of potential impacts to these species in this project area is not required.

However, habitat that may be suitable for western prairie fringed orchid or Small White lady's slipper is generally present in the geographic areas where transmission lines may be sited for Pump Stations #22, #23 and #24. Once final line routes are determined at these locations, NPPD agrees to:

- Complete field surveys for these plant species during the appropriate bloom periods only in areas along the final line routes that are considered "suitable" habitat.
- Delineate and mark areas where either species is observed as "avoidance areas" where placement of structures and construction traffic will not occur.

<u>**River Otter**</u> – Of the four proposed transmission project areas, the only area that may have suitable habitat for river otters is the crossing of the Platte River near Clarks, Nebraska associated with the construction of a transmission line to Pump Station #24. River otters use dens that can be up to $\frac{1}{2}$ mile from the nearest water body. NPPD completed a river otter den survey of the Platte River crossing area in 2011 with no dens identified. As river otters can be very mobile and ranges expand, NPPD agrees to:

- Complete a river otter den survey prior to construction.
- Avoid construction in the area if active den(s) are identified, until after June 15 when the river otter natal denning period has passed.

Once pump station locations and tie-in locations into NPPD's transmission system have been finalized, NPPD will contact the USFWS and the NGPC to continue coordination efforts.

Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr. Environmental Manager

Attachment

Cc: Michelle Koch (NGPC) Don Veseth (NPPD)

File: ENV705.1212,1214,1215



Nebraska Public Power District Always there when you need us

December 27, 2012

Mr. Michael D. George Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Re: Nebraska Public Power District Transmission Lines (Keystone XL Pipeline Pump Stations #22, #23, and #24)

Dear Mr. George:

It is Nebraska Public Power District's (NPPD) understanding that as a result of recent conversations between the US Fish and Wildlife Service (USFWS) and TransCanada that each power provider associated with the Keystone XL Project is being asked to provide USFWS with a letter indicating the willingness of power providers to work with USFWS regarding threatened and endangered species.

Nebraska Public Power District (NPPD) is a supplier of retail and wholesale electric service in Nebraska. Pump stations associated with the Keystone XL Project will require electric service and will represent significant electric loads to the local electric service provider. While NPPD will not be providing electric service directly to these pump stations at a retail level, NPPD will provide electric service to NPPD wholesale customers, who in turn will provide electric service to the pump stations. In order for the wholesale customers to provide reliable electric service to Keystone XL Pump Stations #22, #23, and #24, NPPD must construct additional 115 kV transmission lines. Accordingly, NPPD will establish three separate 115 kV transmission line projects, one to each of the three pump stations.

NPPD follows a very structured route identification and selection process with an emphasis on public involvement, including coordination with various agencies that may have jurisdiction in the line route study areas. Such agencies include the USFWS, as well as the Nebraska Game and Parks Commission (NGPC). For these projects, NPPD is committed to continue coordination with both agencies regarding measures that may need to be incorporated into route selection, engineering/design and construction of the transmission lines to address potential impacts to threatened and endangered species that may occur in certain specific areas.

Once pump station locations and tie-in locations into NPPD's transmission system have been finalized, it is NPPD's plan to contact the USFWS and the NGPC to begin coordination efforts.

Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr. Environmental Manager

Attachments

- Cc: Robert Harms (USFWS) Michelle Koch (NGPC) Don Veseth (NPPD)
- Bc: Jedd Fischer (NPPD) Larry Linder (NPPD) Lynn Askew (POWER Engineers) Mike Tatterson (POWER Engineers)



March 7, 2013

Subject: Keystone XL Project

To: Robert R. Harms Fish and Wildlife Biologist U.S. Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801 Office: (308) 382-6468, Extension 17 Cell: (308) 390-0871

Dear Mr. Harms

On March 5, 2013 you and I inspected the proposed site for the Keystone XL Fairmont Pumping Station PS-25R. The proposed pumping station is located in the Northwest corner of Section 11, Township 8 North and Range 2 West in Fillmore County Nebraska. We also inspected the two possible Electrical Transmission Line Routes to serve the pumping station.

The primary line route would run east to west along the north side of said section 11 on County Road B for a distance of approximately one mile. The second possible line route would run north to south from said pumping station location north along County Road 17 for approximately two miles. Both routes are surrounded by mostly flat irrigated farm land.

In conclusion, it was my understanding that neither one of the proposed line routes will present any danger to migratory birds. Thank you for helping me and the District on this matter.

Sincerely,

Gull but

Jeff Burk Purchasing Agent Perennial Public Power District

2122 South Lincoln Avenue P.O. Box 219 • York, Nebraska 68467 Phone: 402 362 3355 • Fax: 402 362 3623 Web: www.perennialpower.com



December 19, 2012

Mr. John Cochnar Acting Field Supervisor US Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801

Dear Mr. Cochnar:

This letter is sent to reaffirm Westar Energy's commitment to complying with USF&WS regulations in our construction of lines associated with the proposed Keystone XL Pipeline Project in Kansas. We routinely work with Dan Mulhern of your Ecological Services office in Manhattan, Kansas.

Please let me know if you have any questions or concerns, or require more detailed information. Thank you.

Sincerely,

3nd Cora tos

Brad Loveless Director, Biology & Conservation Programs Westar Energy

Cc: Chad Luce, Westar Energy Larry Sibbald, TransCanada



March 4, 2013

Robert R. Harms Fish and Wildlife Biologist U.S. Fish and Wildlife Service 203 West Second Street Grand Island, Nebraska 68801

Mr. Harms,

As a follow up to our previous conversation regarding the Keystone Pipeline Pump Stations number 29 and 27; Westar Energy will construct electrical transmission lines to supply energy to these pump stations in the future, after the project is approved by the Department of State. The two transmission line projects associated with these pump stations are Line 161.04A; TC Burns to Midian, for pump station number 29, located northeast of Potwin in Butler County, and Line 115.107; Clay Center to TC Riley, for pump station number 27, located southeast of Clay Center in Clay County, Kansas.

The Line 161.04A; TC Burns to Midian project has potential for affecting the federally listed endangered Whooping Crane (*Grus americana*) as the western most 1.6 miles of this project is located in the 95% whooping crane sighting corridor. The project area was assessed using the most recent USFWS approved methods, and it was determined there is no suitable habitat for this species within a mile of the proposed transmission line; therefore line marking is not necessary.

The Line 115.107; Clay Center to TC Riley project had no potential for affecting the whooping crane as the project is located outside the 95% sighting corridor. This line does however cross the Republican River, thus bird diverters will be placed on the shield wires of the span crossing the river to enhance visibility and assist in preventing avian collisions.

Please let me know if you need any additional information to assist in your assessment, or if you have any questions.

Sincerely,

Pam Tennison-Rindt, PWS, CISEC Permitting & Compliance Analyst Westar Energy, Inc.

Cc; Dan Mulhern, USFWS Manhattan



818 S Kansas Ave / PO Box 889 / Topeka, Kansas 66601-0889

Ker'd Mar 14/13



DEPARTMENT OF GAME, FISH, AND PARKS

Foss Building 523 East Capitol Pierre, South Dakota 57501-3182

March 4, 2013

TransCanada Pipelines Limited Stephen Marr, Manager – Keystone XL 2700 Post Oak Blvd Suite 400 Houston, TX 77056

Dear Stephen,

The Department of Game, Fish, and Parks (GFP) appreciates the time the Keystone XL project team has dedicated with our staff to discuss the pipeline route, identified concerns, and alternative approaches to minimize impacts to the greater sage-grouse. We also appreciate the development of a mitigation proposal to monitor the impacts of constructing the pipeline and to obligate resources for habitat enhancements to benefit sage-grouse.

As you know, there is a west-wide effort to ameliorate sage-grouse threats to avoid an ESA listing in 2015. While the sage-grouse range in SD is primarily two northwestern counties, we recognize the implications would be far reaching if this species were to be listed. As such, we are engaged on several fronts to avoid that action. None is more notable than assisting with the implementation of one of the most proactive programs, the USDA Natural Resource Conservation Service (NRCS) Sage Grouse Initiative.

Through this NRCS initiative, we partner a biologist position with Pheasants Forever and NRCS in western SD that works directly with landowners to enroll in incentivebased programs covering a variety of range management practices specifically to address sage-grouse threats. The mitigation dollars allocated by TransCanada would be a great addition to the already dedicated resources and will complement this initiative and other efforts designed to benefit sage-grouse and sagebrush habitats. Because we currently partner with Pheasants Forever on sage-grouse conservation and they administer other sage-grouse conservation funds, we would suggest your consideration of Pheasants Forever to administer the SD mitigation funds.

It will be important to evaluate if any impacts occur as a result of the construction and associated infrastructure of the pipeline. Currently, GFP staff is coordinating ideas with Montana Game and Fish staff on evaluation/research approaches and the possibility of pooling research funds provided by TransCanada. This coordination will assure a consistent and scientifically sound approach is used while maximizing resources and efficiency.

Page 2 March 4, 2013

Again, thank you for coordinating with GFP staff on this project. Please continue to work through Tom Kirschenmann, Chief of Wildlife (<u>tom.kirschenmann@state.sd.us</u>, 605.773.4192, on this project and the mitigation proposal.

Sincerely,

fev R. Vonk, Jef

Department Secretary

JV:da

cc: Tony Leif, Wildlife Division Director Tom Kirschenmann, Chief of Wildlife USFWS, Noreen Walsh – Regional Director, Region 6 Dept. of State, K. Nicole Gibson – ESA Lead, Keystone XL Project



United States Department of State

Bureau of Oceans and International Environmental and Scientific Affairs

Washington, D.C. 20520

July 9, 2015

FWS-NE: 2013-164

Ms. Eliza Hines Nebraska Field Supervisor U.S. Fish and Wildlife Service Nebraska Ecological Services 9325 South Alda Road Wood River, Nebraska 68883

Subject: Request for Reinitiation of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings

Dear Ms. Hines,

The U.S. Department of State (the Department) requests to reinitiate consultation with the U.S. Fish and Wildlife Service (USFWS) Nebraska Field Office consistent with section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA), due to the recent (December 11, 2014) USFWS listing of the rufa red knot (*Calidris canutus rufa*) as threatened. In the May 15, 2013 transmittal of the FWS-NE: 2013-164 Biological Opinion (BO) on the Effects to Threatened and Endangered Species from the Issuance of a Presidential Permit to TransCanada Keystone XL Pipeline (Keystone) by the U.S. Department of State, the USFWS advised that the Department should reinitiate consultation if a new species is listed or critical habitat designated that may be affected by the action, consistent with 50 CFR § 402.16 (USFWS 2013a).

The rufa red knot is a sporadic and uncommon migrant that may appear throughout the regional action area of the proposed TransCanada Keystone XL Pipeline Project (Project). Based on the technical assistance provided by the USFWS, the information discussed during the Voluntary Conference Meeting between the Department and the USFWS¹ held on May 28, 2014 in Grand Island, Nebraska when the species was proposed for listing, the Department's attached analysis of effects, and the specific conservation measures described in the USFWS (2013a) and January 2014 Final Supplemental Environmental Impact Statement for the Keystone XL Project (Appendix Z, pp. 20-26 and 43-46), our assessment is that the Keystone XL project *may affect*, *but is not likely to adversely affect*, the rufa red knot.

¹ Other attendees included Bureau of Land Management (BLM), Montana Fish, Wildlife & Parks, Nebraska Game & Parks Commission, ERM, and Westech.

In reinitiating consultation, the Department is requesting concurrence with our assessment that the Keystone XL project *may affect, but is not likely to adversely affect*, the rufa red knot. The USFWS response to our request will serve to amend the May 15, 2013 BO, as appropriate.

If you have any questions, please contact me at: 202-647-7428 or <u>HassellMD@state.gov</u>. Thank you for your assistance.

Sincerely,

Maryo, Hussell

Mary D. Hassell Office of Environmental Quality and Transboundary Issues (EQT) Bureau of Oceans and International Environmental & Scientific Affairs (OES) U.S. Department of State

Cc:

Robert R. Harms Fish and Wildlife Biologist U.S. Fish and Wildlife Service 9325 S Alda Rd Wood River, NE 68883

Jim Stobaugh Bureau of Land Management 1340 Financial Blvd Reno, NV 89502

Jim White TransCanada 4547 Rincon Pl Montclair, VA 22025

Andrew Bielakowski ERM 1218 3rd Avenue, Suite 1412 Seattle, WA 98101

Biological analysis of effect of the Proposed Keystone XL Pipeline Project on the Rufa red knot (Calidris canutus rufa)

Status of Species

The rufa red knot occurs as a sporadic and somewhat uncommon migrant throughout the proposed Project area. Rufa red knots are generally restricted to ocean coasts during winter, and occur primarily along the coasts during migration. However, small numbers of rufa red knots are reported annually across the interior United States during spring and fall migrations (eBird 2014 and Jorgensen 2014). There is no evidence that rufa red knots use any non-coastal sites as traditional stopover locations with the possible exception of a few lakes, primarily saline, in the northern-most portion of the Great Plains (Central Flyway Council 2013), which do not occur within the area of the proposed Project. On December 11, 2014, the USFWS issued a final rule listing the rufa red knot as a threatened species (USFWS 2014a). No critical habitat has been proposed at this time (USFWS 2014a).

Life History

The rufa red knot is a large, bulky sandpiper, about 9 to 11 inches (23 to 28 centimeters) in length. It has a relatively short, straight bill tapering to its tip, and its legs are short and thick. Its head and breast are reddish during breeding plumage and gray the rest of the year. In breeding plumage, the female has light-colored feathers amongst the belly feathers and a less distinct eyeline. The sexes appear similar in winter. The female has slightly longer wings and bill. Immature birds are similar to adult winter plumage, but have gray back feathers outlined in white and black, giving it a scaly appearance (Cornell Lab of Ornithology 2014). The rufa red knot is usually quiet away from the breeding grounds, but it may make a subdued, somewhat nasal whine that increases in strength and scale for about one second (Cornell Lab of Ornithology 2014).

The rufa red knot winters in various locations ranging from the Tierra del Fuego and Patagonia areas in Argentina and Chile to Brazil, the Caribbean, and the southern United States. The research community generally makes a distinction between the populations of the rufa red knot based on their wintering location with the populations wintering in Argentina and Chile identified as the "southern-wintering" populations and those wintering further north in the United States, Brazil, and the Caribbean as the "northern-wintering" populations (USFWS 2014b). However, research data indicates that there is mixing that occurs during both the spring and fall migrations between the wintering populations (USFWS 2014b). The "southern-wintering" population of the rufa red knot makes one of the longest yearly migrations, travelling around 9,300 miles each way between its breeding grounds in the Canadian arctic to winter in South America (Cornell Lab of Ornithology 2014). During its migrations, this species generally feeds in coastal marine and estuarine habitat along the sand and muddy shorelines where intertidal invertebrates may easily be found and consumed. In North America, rufa red knots are commonly found along sandy, gravel, or cobble beaches, tidal mudflats, salt marshes, shallow coastal impoundments and lagoons, and peat banks (USFWS 2013b). The primary food items for the rufa red knot in non-breeding habitats include blue mussel, spat (juvenile mussels), clams, snails, polycheate worms, insect larvae, and crustaceans. During the spring breeding season, the eastern population of rufa red knot consumes horseshoe crab eggs, mussels, and spat; horseshoe crab eggs are disappearing because horseshoe crabs are overharvested for use as bait in conch and eel pots. Without a sufficient supply of horseshoe crab eggs for food, many knots fail to complete their epic journey (American Bird Conservancy 2014).

Status and Distribution

The rufa red knot occurs as a sporadic and somewhat uncommon migrant throughout the proposed Project area.



Source: eBird 2012 and Jorgensen 2014.

Montana

The rufa red knot occurs as a migrant in Montana and has been identified in stopover areas in both the spring and fall. Although it has not been identified every year, approximately one to four individuals are regularly recorded each year (MNHP and MFWP 2014). There is no evidence for regular or critical migratory stopover habitat in Montana (Central Flyway Council 2013).

North Dakota

The observations of rufa red knots in North Dakota are scattered throughout the state. No sites are consistently used by rufa red knots, and none could be considered critical stopover habitat (Central Flyway Council 2013).

South Dakota

The South Dakota Ornithologists Union documents 26 sightings of the rufa red knot since 1974 in both the spring and fall migration seasons at Bennett, Brown, Clay, Deuel, Fall River, Faulk, Harding, Hughes, Kingsbury, Lake, Miner, Potter, Roberts, Sully, and Yankton counties. At one sighting in 2007, 30 individuals were identified; however, sightings are sporadic and uncommon (USFWS 2014b).

Nebraska

The rufa red knot occurs rarely in Nebraska, far less than annually, as a casual spring and fall migrant found in mudflats and shorelines (Jorgensen 2014). The rufa red knot does not have a defined range in Nebraska (USFWS 2014c) but confirmed observations have been reported across the state from wetlands, river systems, and impoundments. Information within the state database for the rufa red knot is not available because it does not reproduce in Nebraska and therefore is not tracked (USFWS 2014d). However, a compilation of rufa red knot observations in Nebraska was prepared by Jorgensen (2014) and Lake McConaughy is the only site in the state where the species has been observed greater than three times.

Kansas

The rufa red knot occurs rarely in Kansas, far less than annually, and the Central Flyway Council recommends considering the species an irregular migrant or a vagrant in Kansas (Central Flyway Council 2013).

Impact Evaluation

Construction

Rufa red knots need to encounter favorable habitat, food, and weather conditions within narrow seasonal windows as the birds migrate along stopovers between wintering and breeding areas. For example, the rufa red knot population decline that occurred in the 2000s was caused primarily by reduced food availability from increased harvests of horseshoe crabs, exacerbated by small changes in the timing that rufa red knots arrived at the Delaware Bay on the U.S. east
coast (USFWS 2014b). Rufa red knots may also be particularly vulnerable to climate change, which is likely to affect the arctic tundra ecosystem where they breed; the quality and quantity of coastal and potentially inland habitats due to rising sea levels and reduced inland water locations; the quantity and timing of invertebrate food resources throughout the bird's range; and the severity, timing, and location of storm and weather patterns (USFWS 2013c). Since the rufa red knot nests in the Canadian arctic, nesting would not be impacted by proposed Project activities. The primary construction-related impacts would be direct in the reduction of potential stopover habitat in wetlands, riparian areas, and waterways during construction as well as indirect disturbance and potential exposure to fuel spills and leaks from construction machinery. The chance of construction-related impacts to migrating rufa red knots is minimal, particularly because there is no specific and consistent habitat used by the rufa red knot within the proposed Project area. Indirect impacts could result from increased noise and human presence at work site locations if migrating rufa red knots are within the vicinity of the proposed Project. General conservation measures from the May 2013 BO applicable to the rufa red knot are listed in Table 1.

Table 1. General Conservation Measures

All equipment maintenance and repairs will be performed in upland locations at least 100 feet from all water bodies and wetlands.

Refueling and lubrication of construction equipment will be restricted to upland areas at least 100 feet away from streams and wetlands.

All equipment would be parked overnight at least 100 feet from a watercourse or wetland.

Equipment will not be washed in streams or wetlands.

Spills of fuel and other hazardous materials will be cleaned-up immediately in accordance with the SPCCP and hazardous wastes associated with spills and leaks will be disposed of in accordance with applicable laws and regulations.

Each construction and cleanup crew will have on site, sufficient tools and materials to stop leaks including supplies of absorbent and barrier materials that would allow for rapid containment and recovery of spilled materials.

Keystone would mark and maintain a 100-foot area from river crossings, free from all hazardous materials, fuel storage, and vehicle fuel transfers. These buffers would be maintained during construction except when fueling and refueling the water pump near the river edge that is required for the horizontal directional drill (HDD) crossing and hydrostatic test water withdrawal. Water pump fueling will be completed by trained personnel, secondary containment will be used, and a spill kit will be onsite.

In addition, conservations measures established for the interior least tern, whooping crane and piping plover would be applicable to the rufa red knot and are in Tables 2 through 4.

Table 2. Interior Least Tern Conservation Measures

Major rivers that contain interior least tern habitat including the Platte, Loup, and Niobrara rivers in Nebraska; Cheyenne River in South Dakota; and Yellowstone and Missouri rivers in Montana, will be crossed using the HDD method.

HDD boring under the Platte, Loup, and Niobrara rivers in Nebraska; Cheyenne River in South Dakota; and Yellowstone River in Montana will result in a pipeline burial depth of 25 feet or greater below the river bed.

Pre-construction surveys will occur within 0.25-mile from suitable breeding habitat at the Platte, Loup, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone and Missouri rivers in Montana during the nesting season (from May 1 through September 1) to ensure that there are no nesting terns within 0.25-mile of the construction area. Daily surveys for nesting terns would be conducted during the nesting season when construction activities occur within 0.25-mile of potential nesting habitat.

If interior least tern nests are found at the crossings, then Keystone would: 1) adhere to the 0.25mile buffer of no pipeline construction activity and 2) continue to monitor nests if any are within 0.25-mile of the construction footprint until young have fledged.

Keystone commits to making minor adjustments to the pipeline corridor to avoid impacts to nesting interior least terns in coordination with USFWS. This may involve shifting the pipeline corridor away from nests to avoid disturbances to interior least tern nests or other modifications depending on the circumstances.

Down shielding of lights will be used should HDD occur at night should the HDD site lack vegetative screening, and an active interior tern nest is located within 0.25 mile from the HDD site.

Pump Station 24 (Nebraska): The Nebraska Public Power District agrees to complete nest surveys for interior least terns within an area 0.25-mile upstream and downstream of the proposed river crossing location if construction is expected to take place during the nesting period. Construction would halt if active nests are identified within 0.25-mile of the Platte River crossing area until such time that chicks and adults leave the nest area and nesting is concluded.

The Nebraska Public Power District will install spiral bird flight diverters on the shield wire on the line span between the banks at the Platte River crossing and one span on each side of the crossing.

Table 3. Whooping Crane Conservation Measures

During spring and fall whooping crane migration periods, environmental monitors will complete a brief survey of any wetland or riverine habitat areas potentially used by whooping cranes in the morning before starting equipment following the Whooping Crane Survey Protocol developed by the USFWS and NGPC (Nebraska Game and Parks Commission) and applied to all projects when located near whooping crane habitat. If whooping cranes are sighted during the morning survey or at any time of the day, the environmental monitor will immediately contact the USFWS and respective state agency in Nebraska, South Dakota, North Dakota, and/or Montana for further instruction and require that all human activity and equipment start-up be delayed or immediately cease. Work could proceed if whooping crane(s) leave the area. The environmental monitor would record the sighting, bird departure time, and work start time on the survey form. The USFWS would notify the compliance manager of whooping crane migration locations during the spring and fall migrations through information gathered from the whooping crane tracking program.

Lights will be down-shielded should HDD occur at night during the spring and fall whooping crane migrations in areas that provide suitable habitat.

Pump Station 9 (Montana): Big Flat Electric Cooperative will install avian markers and deflectors within 0.25-mile of the Milk River that will be traversed by the power line to pump station 9. The USFWS will be contacted should a whooping crane be spotted in the area of the proposed power line construction site.

Pump Station 10 (Montana): NorVal Electric Cooperative will install bird flight diverters (BFD) in all locations where the power line comes within 0.25-mile on either side of the Milk River. Additionally, BFDs will be installed for 0.25-mile on either side of two unnamed reservoirs crossed by the proposed power line.

Pump Station 14 (Montana): Montana Dakota Utilities will install BFDs on the static line at 50 foot spacing within 0.25-mile of Pennel Creek and within 0.25-mile of a pond located in the northwest corner of section 35, T9 North, Range 58 East.

If a whooping crane is sighted on the ground within the transmission line project area during construction, Montana Dakota Utilities will cease construction and contact the USFWS.

Pump Station 12 (Montana): McCone Electric Cooperative will install avian markers within 0.25-mile of Buffalo Springs Creek and the Redwater River in accordance with Avian Power Line Interaction Committee (APLIC) standards. If whooping cranes are sighted during fall and spring migrations, McCone Electric Cooperative will delay all work activity until whooping cranes have left the area and immediately contact the USFWS and MFWP for further instruction.

Pump Station 20 (South Dakota): A total of 636 BFDs will be installed by Rosebud Electric Cooperative Inc. at three wetland areas located along the proposed power line alignment to avoid

and minimize risk of collision by whooping cranes near wetland foraging and roosting habitats. Installation of BFDs will be done in accordance with specific marking locations as previously recommended by the USFWS at these three wetland areas located at Township 101 North, Range 77 West, Section 17 and the SE ¹/₄ Section 32, and Township 100 N Range 78 West, section 10, NW1/4 Section 15.

Pump Station 21 (South Dakota): A total of 557 BFDs will be installed by Rosebud Electric Cooperative Inc. to avoid and minimize risk of collision by whooping cranes near wetland foraging and roosting habitats. Installation of BFDs will be done in accordance with specific marking locations as previously recommended by the USFWS at these wetland areas located at Township 97 North, Range 73 West SW ¼ of section 25 and Township 95 North, Range 73 West, Sections 16 and 17.

Pump Station 22, 23, 24, and 26 (Nebraska): The Nebraska Public Power District will complete a field review with USFWS and NGPC to determine if any areas are present with a higher probability of whooping crane use (i.e., wetlands or large ponded areas (stock ponds), meadows, and obvious flight corridors to and from such areas to feeding habitats). Spiral BFDs will be installed, consistent with APLIC standards (APLIC 2012), in appropriate areas as identified in the field review.

The Nebraska Public Power District will complete daily presence/absence whooping crane surveys according to protocol if construction occurs during the spring and fall migration periods in areas where such surveys are agreed to be appropriate and necessary to avoid disturbance. Should a whooping crane(s) be sighted within 0.5-mile of a work area, all work will cease until the whooping crane(s) leaves that immediate area. The USFWS and NGPC will be contacted immediately and notified of the presence of whooping crane(s).

Pump Station 27 (Kansas): Westar Energy will install BFDs to prevent avian collisions where the power line crosses the Republican River even though an evaluation of whooping crane use indicated that it was unlikely that the species would be found in this area.

Table 4. Piping Plover Conservation Measures

The Platte, Loup, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone and Missouri rivers in Montana will be crossed using the HDD method which would result in a burial depth of 25 feet or greater below the river bed.

If construction were to occur during the piping plover nesting season (from April 15 through September 1), Keystone would conduct pre-construction surveys within 0.25-mile from suitable nesting habitat at the Platte, Loup, and Niobrara rivers in Nebraska; the Cheyenne River in South Dakota; and the Yellowstone and Missouri rivers in Montana to ensure that there are no nesting pairs within 0.25-mile of the construction area. Daily surveys for nesting plovers will be

conducted when construction activities occur within 0.25-mile of potential nesting habitat during the nesting season.

If a piping plover nest(s) are found at the crossings, then Keystone will: 1) adhere to the 0.25mile buffer of no construction activity and 2) continue to monitor nests if any are within 0.25mile of the construction footprint until the young have fledged.

Keystone commits to making minor adjustments to the pipeline corridor to avoid impacts to nesting piping plovers in coordination with the USFWS. This may involve shifting the pipeline corridor away from nests to avoid disturbances to piping plover nests or other modifications depending on the circumstances.

Down shielding of lights will be used should HDD occur at night, should the HDD site lack vegetative screening, and an active piping plover nest is located within 0.25 mile from the HDD sites.

Pump Station 9 (Montana): Big Flat Electric Cooperative designed and located the power line to this pump station so that it is 3 miles east of any piping plover nesting or habitat areas. If nesting piping plovers are found to be present based on surveys for the species, all construction would cease until piping plover chicks fledge from the site.

Pump Station 10 (Montana): NorVal Electric Cooperative will install BFD in all locations where the power line comes within 0.25-mile on either side of the Milk River. Additionally, BFDs will be installed for 0.25-mile on either side of two unnamed reservoirs crossed by the proposed power line.

Pump Station 24 (Nebraska): The Nebraska Public Power District agrees to complete nest surveys for piping plovers within an area 0.25-mile upstream and downstream of the proposed river crossing location if construction is expected to take place during the nesting period. Construction would halt if active nests are identified within 0.25-mile of the Platte River crossing area until such time that chicks and adults leave the nest area.

The Nebraska Public Power District will install spiral BFDs on the shield wire on the line span between the banks at the Platte River crossing and one span on each side of the crossing.

Operations

Operations of the proposed Project are expected to have little, if any, effect on the species. Travel to and from pump stations or valves will be along established roads that do not provide habitat for rufa red knot, particularly as a sporadic and uncommon migrant. Overflights by aircraft to monitor the pipeline would be at an elevation that should not negatively affect the species. Direct contact with a crude oil spill is unlikely, but could result in adverse effects to rufa red knots due to plumage oiling and crude oil ingestion from contaminated plumage and prey. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to rufa red knot are unlikely due to the low probability of a spill, low probability of the spill coinciding with the presence of rufa red knot individuals, and low probability of the spill reaching a major waterbody in sufficient amounts to cause toxic effects. The magnitude of spill effects varies with multiple factors, the most significant of which include: 1) the amount of material released, 2) the size of the spill dispersal area, 3) the type of spills, 4) the species assemblage present, 5) climate, and 6) the spill response tactics employed.

Red knots migrate during the day and night. Birds that migrate at night can sometimes be attracted to artificial lights subjecting them to collisions with structures. Outdoor lighting, however, is not expected to affect the rufa red knot because only one bulb would be used at each pump station above the entry door, none of which are located closer than five miles to a river with suitable stopover habitat. Communication towers would be below the height that requires lighting by the Federal Aviation Administration and below the height where guy wires would be required for tower stability to avoid collision by red knots on guy wires and other structures during their spring and fall migrations.

Connected Actions

Impacts to the rufa red knot as a result of construction and operation of the Bakken Marketlink Project and the Big Bend to Witten 230-kV Transmission Line would be the same as, or similar to, the proposed Project. The construction of new power lines along the Project route by at least 20 power providers to provide electricity to 20 pumping stations could add to the incremental collision mortality of migrant rufa red knots, especially where these power lines are located near resting and/or foraging habitats used during migration. Rufa red knots are susceptible to collisions with power lines. In recognition of the risk that these power lines pose to whooping cranes, least terns, and piping plovers, implementation of several conservation measures were agreed upon in the May 15, 2013, BO. These measures primarily involve the installation of bird flight diverters on power lines when they cross rivers, streams, and wetlands or when they are located near these water features. The conservation measures are consistent with standard measures outlined in *Mitigating Bird Collision with Power Lines* (APLIC 1994). Power lines that will be marked with bird flight diverters are located in the same areas that would be used by the red knot during its migration. As such, the red knot will be a beneficiary of these conservation measures.

Keystone would not construct or operate these electrical distribution lines, but have informed electrical power providers of the requirement to consult with USFWS on federal threatened, endangered, proposed and candidate species, BLM sensitive species, state threatened and endangered species, and species of conservation concern for the electrical infrastructure components constructed for the proposed Project. As a result, power providers have committed to avoidance and conservation measures, in coordination with the USFWS, for species that may be affected by service lines and/or pump stations.

Cumulative Impacts

The Department has concluded that implementation of conservation measures in Tables 1 through 4 would avoid potential effects of the proposed Project to the rufa red knot. Thus, there is limited potential for effects of these impacts to be cumulative with other projects. Existing conservation measures proposed for other migratory bird species (i.e., whooping crane (Grus americana), piping plover (Charadrius melodus), and interior least tern (Sternula antillarum), which include protection of migration stopover habitats through use of HDD crossing methods to avoid disturbance to migration stopover habitats, and installation of bird flight diverters on power lines would also reduce impacts to the rufa red knot. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize affects to these birds.

Implementation of appropriate conservation measures as determined through consultation with the USFWS, and discussions with other federal, state, and local agencies for the species for the proposed Project and for future projects would include impact avoidance and minimization, which would mitigate long-term cumulative impacts.

Determination

Effect on Critical Habitat

The proposed Project would not result in the destruction or adverse modification of federally proposed critical habitat for the rufa red knot as none has been identified for the species.

Effect on the Species

Based on our evaluation, we have determined that the proposed Project may affect, but is not likely to adversely affect, the rufa red knot. This determination is based on the rarity of the species, its status as a sporadic and somewhat uncommon migrant through the proposed Project area, and Keystone's commitment to implementing avoidance and conservation measures described above. Although it is possible that a large spill event could result in an adverse effect on this species and its migration habitat, the probability of adverse effects to the rufa red knot are unlikely due to the low probability of a spill, low probability of the spill coinciding with the presence of rufa red knots, and low probability of a rufa red knot contacting the spilled product.

REFERENCES

- American Bird Conservancy. 2014. Red Knots and Horseshoe Crabs. http://www.abcbirds.org/abcprograms/policy/fisheries/red_knot.html. Accessed June 23, 2014.
- APLIC. See Avian Power Line Interaction Committee.
- Avian Power Line Interaction Committee. 1994. Mitigating Bird Collision with Power Lines: The State of the Art in 1994. Edison Electrical Institute. Washington, D.C.
- Central Flyway Council. 2013. Letter to U.S. Fish and Wildlife Service, Division of Policy and Directives Management, regarding the proposed rule to list *rufa* Red Knot (*Calidris canutus rufa*) as a threatened species. November 26, 2013.
- Cornell Lab of Ornithology. 2014. Rufa Red Knot. http://www.allaboutbirds.org/guide/red_knot/lifehistory. Accessed June 23, 2014
- eBird. 2012. eBird: An online database of bird distribution and abundance [web application]. eBird, Cornell Lab of Ornithology, Ithaca, New York. Available: http://www.ebird.org. Accessed: February 2014.
- Jorgensen, J. 2014, Red Knot (*Calidris canutus*) its distribution and temporal occurrence in Nebraska. Information based on species account from Sharpe et al. 2001, revised by W. Ross Silcock, 14 September 2014.
- MNHP and MFWP. See Montana Natural Heritage Program and Montana Fish, Wildlife & Parks
- Montana Natural Heritage Program and Montana Fish, Wildlife & Parks. 2014. Red Knot Calidris canutus. Montana Field Guide. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. http://FieldGuide.mt.gov/detail_ABNNF11020.aspx. Accessed June 20, 2014.
- U.S. Department of State. 2014. Final Supplemental Environmental Impact Statement Keystone XL Project.
- USFWS. See U.S. Fish and Wildlife Service.
- U.S. Fish and Wildlife Service. 2013a. Biological Opinion of the effects to threatened and endangered species from the issuance of a Presidential Permit to TransCanada Keystone XL Pipeline (Keystone) by the U.S. Department of State for the proposed construction, operation, and maintenance of the Keystone XL pipeline and associated facilities at the border and interrelated and interdependent actions. Nebraska Ecological Services Field Office, U.S. Fish and Wildlife Service. 87 pp.

. 2013b. Previous Federal Actions SUPPLEMENT TO Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the *Rufa* Red Knot (Calidris canutus *rufa*) [Docket No. FWS-R5-ES-2013-0097; RIN 1018-AY17]

. 2013c. Endangered and Threatened Wildlife and Plants; Proposed Threatened Status for the *Rufa* Red Knot (*Calidris canutus rufa*); Proposed Rule. Federal Register 78(189): 60024-60098.

_____. 2014a. Endangered and Threatened Wildlife and Plants; Threatened Species Status for the Rufa Red Knot; Final Rule. Federal Register 79(238): 73706-73748.

. 2014b. Rufa Red Knot Background Information and Threats Assessment Supplement to Endangered and Threatened Wildlife and Plants; Final Threatened Status for theRufa Red Knot (Calidris canutus rufa) [Docket No. FWS-R5-ES-2013-0097; RIN AY17].

_____. 2014c. US Counties within Nebraska in which the Red Knot, is known to or is believed to occur. Website: http://ecos.fws.gov/speciesProfile/profile/countiesByState.action?entityId=8621&state=N ebraska. Accessed September 5, 2014.

_____. 2014d, May 28. Personal communication. In person meeting with the Department, USFWS, Keystone, and other agencies regarding an informal conference for the *rufa* Red knot and Northern Long-Eared Bat. Meeting in Grand Island on ESA issues.



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services Nebraska Field Office 9325 South Alda Road Wood River, Nebraska 68883

August 27, 2015

FWS-NE: 2013-164

Ms. Mary D. Hassell Office of Environmental Quality and Transboundary Issues (EQT) Bureau of Oceans and International Environmental and Scientific Affairs (OES) U.S. Department of State Washington, D.C. 20520

RE: Request for Reinitiation of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings

Dear Ms. Hassell:

This is in response to your letter dated July 9, 2015, requesting reinitiation of section 7 consultation and concurrence that the proposed Keystone XL Pipeline Project (Project) may affect, but is not likely to adversely affect, the federally threatened Rufa Red Knot *(Calidris canutus rufa)*. After reviewing your July 9, 2015, letter and attached Biological Analysis of the effect of the Project on the species, the U.S. Fish and Wildlife Service (Service) has concluded that it concurs with the U.S. Department State's (Department) determination of effect.

This concludes section 7 consultation pursuant to the Endangered Species Act. Consultation should be reinitiated, however, if new information reveals impacts of the Project that may affect listed species, a new species is listed, new critical habitat is designated, or the Project is subsequently modified.

The Service appreciates the opportunity to work cooperatively with the Department in assuming a shared responsibility for protecting federal trust fish and wildlife resources along the proposed Project route in Montana, South Dakota, Nebraska, and Kansas.

If you have any questions or require technical assistance, please do not hesitate to contact Mr. Robert Harms at <u>robert harms@fws.gov</u>; (308) 382-6468, extension 208.

Sincerely,

Ěliza Hines Nebraska Field Supervisor

Cc: USFWS, Denver CO (Attn: Clint Riley) USFWS, Denver CO (Attn: Doug Laye) USFWS, Helena, MT (Attn: Jeff Berglund) USFWS, Pierre, SD (Attn: Charlene Bessken) USFWS, Manhattan, KS (Attn: Dan Mulhern) USDOI, Denver CO (Attn: Kate Williams-Shuck) BLM, Reno, NV (Attn: Jim Stobaugh)



United States Department of State

Washington, D.C. 20520

March 15, 2017

FWS-NE: 2013-164

Ms. Eliza Hines Nebraska Field Supervisor U.S. Fish and Wildlife Service Nebraska Ecological Services 9325 South Alda Road Wood River, Nebraska 68883

Subject: Request for Reinitiation of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings

Dear Ms. Hines,

On January 26, 2017, TransCanada Keystone Pipeline, L.P., resubmitted an application to the U.S. State Department ("Department") for a Presidential Permit authorizing the construction, connection, operation, and maintenance of pipeline facilities for the importation of crude oil to be located at the international border between the United States and Canada at Phillips County, Montana. The Department is reviewing the application as well as the proposed plans for the construction of 20 power lines to serve 20 pumping stations along the proposed route ("Project") previously analyzed in the May 15, 2013 biological opinion ("BO"). After reviewing the relevant information, the Department is requesting reinitiation of consultation with the U.S. Fish and Wildlife Service (USFWS) Nebraska Field Office consistent with section 7(a)(2) of the Endangered Species Act (ESA) of 1973, as amended. In particular, the Department is reinitiating section 7 consultation on the Project because of the listing of the northern long-eared bat (*Myotis septentrionalis*) as threatened and seeks concurrence of its findings that the Project may affect but is not likely to adversely affect the northern long-eared bat, as set forth in the attached effects analysis.

The northern long-eared bat was listed as a federally threatened species on April 2, 2015 and thus, was not a species that was considered in the BO.¹ Because the species is significantly affected by white-nose syndrome, the USFWS published an ESA Section 4(d) rule in the Federal Register on January 14, 2016, which specifically defines take prohibitions in order to protect maternity colonies and hibernaculum when a federal or non-federal action is located within the

¹ The rufa red knot was also listed as threatened after the issuance of the May 2013 BO. The Department reinitiated consultation for the rufa red knot which was completed in August 2015 with the USFWS concurring in a "may affect, but is not likely to adversely affect" determination.

white-nose syndrome zone. The northern long-eared bat's range is located within the regional action area of the proposed Project. In particular, a portion of the Project is located within the white-nose syndrome zone in Kansas and Nebraska where specific actions have been outlined by the USFWS to protect maternity colonies and hibernaculum for the species. Proposed Project segments in Montana and South Dakota occur outside of the currently delineated white-nose syndrome zone.

Technical assistance provided by the USFWS; a review of the 4(d) rule, information discussed during the Voluntary Conference Meeting between the Department and the USFWS² held on May 28, 2014, in Grand Island, Nebraska; and information received by the Department from USFWS in the past month helped to inform the Department's attached analysis of effects and determination. The Department commits, in coordination with the applicant, TransCanada Keystone Pipeline, L.P., that, should the Presidential Permit be granted, to abide by the requirements outlined in Endangered and Threatened Wildlife and Plants; 4(d) Rule for the Northern Long-Eared Bat, ((50 CFR Part 17, Federal Register Notice, January 14, 2016 (81 Fed. 1900)) summarized in the key for federal projects and Reg. (https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/KeyFinal4dNLEB FedAgencies1 7Feb2016.pdf).

 Conservation Measure 1: Tree Removal Near Known Northern Long-eared Bat Hibernacula

TransCanada and the associated utilities responsible for the construction of power lines to pump stations, will not remove any trees within a 0.25-mile (0.4-km) buffer around known northern long-eared bat hibernacula (as determined by coordination with State Natural Heritage Inventory databases in Kansas and Nebraska, field surveys, and/or coordination with subject matter experts knowledgeable about the species).

• Conservation Measure 2: Tree Removal Near Known Maternity Roost Trees Known roosts (as determined by coordination with State Natural Heritage Inventory databases in Kansas and Nebraska, field surveys, and/or coordination with subject matter experts knowledgeable about the species) will be protected and TransCanada and the associated utilities responsible for the construction of power lines to pump stations, will avoid cutting or destroying of any other trees within a 150-foot (45-meter) radius from the known, occupied maternity roost trees during the pup season (June 1 through July 31).

Given these commitments, the Department is requesting written concurrence with our assessment that the Keystone XL project *may affect, but is not likely to adversely affect*, the northern long-eared bat.

The Department has evaluated the status of other species to determine whether further ESA consultation may be required. The Dakota Skipper *(Hesperia dacotae)* was listed as federally threatened on November 24, 2014. The species is found in mesic and upland native tall grass prairie habitat in the upper Midwest, including northeast South Dakota. The Project is located in

² Other attendees included U.S. Bureau of Land Management, Montana Fish, Wildlife & Parks, Nebraska Game and Parks Commission, ERM, Inc., and WESTECH Environmental Services, Inc.

southern and southwest South Dakota, approximately 150 miles southwest of the area where the Dakota Skipper is found in South Dakota. Additionally, suitable habitat is unavailable for the Dakota Skipper in the area of proposed Project. For these reasons, the Department has concluded that the Project would have no effect on the Dakota Skipper and has determined that reinitiation of Section 7 consultation with the USFWS for this species is unnecessary.

The 2013 BO reached a determination of "no jeopardy" for the endangered American burying beetle (Nicrophorus americanus) and concurred with our determinations that the Project "may affect, but is not likely to adversely affect" the endangered black-footed ferret (Mustela nigripes), interior least tern (Sternula antillarum athalassos), whooping crane (Grus americana), and pallid sturgeon (Scaphirhynchus albus); and the threatened piping plover (Charadrius melodus) and western prairie fringed orchid (Platanthera praeclara). Additionally, in August 2015, we determined, and USFWS concurred, that the Project "may affect, but is not likely to adversely affect" the rufa red knot (Calidris canutus rufa). The Department has considered whether reinitiation of consultation might be required for any species previously addressed in the 2013 Biological Opinion, or in the 2015 consultation which resulted in a "not likely to adversely affect" determination for the rufa red knot (Calidris canutus rufa). The Department has reviewed the proposed route for the Project, including proposed plans for the construction of the power lines to serve pumping stations located along the 875-mile-long route. The Department has concluded that the proposed pipeline route, which follows the same 200-foot-wide corridor analyzed in the BO, and power lines have not been modified to the extent that the Project now may have an effect on federally listed species that were not previously considered in the BO and the 2015 consultation. The Department further concludes that there is no new information that reveals an effect of the proposed Project on the listed species or critical habitat in a manner not previously considered in the BO and 2015 consultation. Accordingly, the Department determines that reinitiation of consultation on these species is not required under 50 C.F.R. § 402.16.

Please also note the USFWS determined that the greater sage-grouse (*Centrocercus urophasianus*) was not warranted for listing in October 2015. In April 2016, the listing of the candidate species Sprague's pipit (*Anthus spragueii*) was determined to be not warranted. As such, we request confirmation from the USFWS that the conservation measures identified for these species in the BO are no longer in force. However, we recognize that the greater sage-grouse and possibly the Sprague's pipit require further coordination with the Bureau of Land Management and States of Montana (per the State of Montana's Sage-Grouse Executive Order 12-2015) and South Dakota.

The Department recognizes that the incidental take statement, which authorizes take of the American burying beetle as outlined in the BO, was issued to the Department. The Department will provide the appropriate oversight of the applicant to ensure implementation of reasonable and prudent measures and conservation measures for the American burying beetle as well as other conservation measures outlined in the BO for other federally listed species. The Department understands that the incidental take statement also covers any incidental take caused by TransCanada, provided it is in compliance with the terms and conditions of the incidental take statement.

If you have any questions, please contact me at: 202-736-7428 or HassellMD@state.gov. Thank you for your assistance.

Sincerely,

Marye Hannele

Mary D. Hassell, CEP Bureau of Oceans and International Environmental & Scientific Affairs (OES) U.S. Department of State

Attachment (1)

1. Northern Long-Eared Bat Habitat Assessment on the Proposed Keystone XL Pipeline Project

Cc:

Mr. Robert R. Harms U.S. Fish and Wildlife Service 9325 S Alda Rd. Wood River, NE 68883

Mr. James Stobaugh National Project Manager (WO350) BLM Nevada State Office 1340 Financial Blvd. Reno, NV 89502

Mr. Dennis Rankin Rural Utilities Service 1400 Independence Avenue, SW Room 2244, Stop 1571 Washington, DC 20250-1571

Ms. Shane Kimbrough Western Area Power Administration P.O. Box 281213 Lakewood, CO 80228-8213

Mr. Jim White TransCanada Corporation 450 1st Street SW Calgary Alberta, Canada T2P 5H1

Biological Analysis of Effect of the Proposed Keystone XL Pipeline Project on the Northern Long-Eared Bat (*Myotis septentrionalis*)

Life History

The northern long-eared bat is a medium-sized mammal, about 3 to 3.7 inches (7.6 to 9.4 centimeters) in length, and has a wingspan measuring between 9 and 10 inches (23 and 26 centimeters) (USFWS 2015a). The bat is identifiable from other *Myotis* species because of its long ears that extend beyond the tip of its nose when laid forward, a long, narrow, and sharp pointed tragus (part of external ear), and a calcar (cartilage spur at ankle) that lacks a keel. Females tend to be larger and heavier than males. It has medium to dark brown fur on its back and dark brown ears and wing membranes (Caceres and Barclay 2000).

The northern long-eared bat uses high-humidity caves and mines for hibernation, which can begin as early as August and continue through the winter months. During the summer, this species utilizes forested habitats for roosts and reproduction. The northern long-eared bat can be migratory, and travel up to 30 miles or more between winter hibernation sites and summer roost sites. The species primarily roosts under the bark of dead and dying trees or on tree species with peeling bark or bark containing many crevices. Forested areas, including riparian corridors provide habitat (e.g., decaying trees, loose bark, tree snags, and stumps) for roosting, feeding, and maternity colonies of northern long-eared bats (Menzel et al. 2002, Owen et al. 2002, Foster and Kurta 1999). The northern long-eared bat appears to be opportunistic in roost selection and will use a variety of tree species for roosts throughout its range as long as the tree forms suitable cavities or retains bark. In addition to natural habitats, the northern long-eared bat may occasionally roost in human structures (e.g., buildings). Northern long-eared bats are known to switch roosts often, typically using one site for 2 to 3 days. Beginning in late-summer to earlyfall, males swarm near hibernacula to begin breeding. Females have delayed fertilization, and a gestation period ranging between 50 and 60 days. Females give birth to a single pup the following May to July, depending on where the colony is located within the species' range (USFWS 2015b).

The northern long-eared bat typically forages on the edge and understory of heavily forested areas and along hillsides, ridges, water, and clearings. These opportunistic insectivores forage 1 to 2 hours after dusk and before dawn (USFWS 2013b). The diet for the northern long-eared bat is diverse and varied according to season and geographical occurrence. However, the diet generally consists of moths, flies, leafhoppers, caddisflies, beetles, and spiders. These bats catch insects by hawking (i.e., catching in flight) and gleaning (i.e., emitting a high-frequency echolocation call to locate on vegetation) (Henderson and Broders 2008). The gleaning call of the northern long-eared bat is of a higher frequency than other *Myotis* bat species, and is higher than the hearing frequency of many moth species, thereby giving it a foraging advantage within its feeding habitat (Caceres and Barclay 2000).

Status and Distribution

The northern long-eared bat is distributed throughout portions of the proposed Project area. Of primary concern for this consultation is the portion of the Project located within the white-nose syndrome positive counties/districts in Kansas and Nebraska (https://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf) Other counties of

interest include Keya Paha, Boyd, and Rock Counties in Nebraska as they have geologic formations (i.e. exposed bed rock, possibly cliff faces) suitable for use as hibernacula. These counties are located on the edge of the white nose syndrome zone and could be included within the zone should positive detection of the fungus that causes white nose syndrome be detected in additional Nebraska Counties in the future.

Nebraska

Northern long-eared bat concentrations occur in the northern tier of the state along the Niobrara River and its tributaries, and in deciduous forests in the eastern one-third of the state (USFWS 2014a). This species may also be found throughout the state in opportunistic roosts when traveling between hibernacula and summer use areas (USFWS 2014a). They are also known to summer in the northwestern parts of Nebraska, specifically the Pine Ridge in Sheridan County, where only males have been documented. Acoustic surveys and mist netting demonstrate that the species can be found in eastern-Nebraska (Robert Harms, personal communication, March 6, 2017). This species is often found in areas with exposed bedrock and limestone mines in Nebraska; these areas are used as hibernaculum in the winter (Robert Harms, personal communication, March 6, 2017).

Kansas

The northern long-eared bat has been documented in Ellis, Graham, Marshall, Osborne, Phillips, Rooks, Russell, Washington, and Leavenworth Counties, although habitat exists for this species in 58 counties (Michele McNulty, personal communication, May 28, 2014). Before this, the species was thought to only migrate through parts of the state (USFWS 2013b).

The 4(d) Rule and Conservation Measures

Within the boundaries of the white nose syndrome buffer zone, the 4(d) rule exempts take of the species due to forestry management activities, maintenance and limited expansion of transportation and utility rights-of-way, prairie habitat management, and limited tree removal projects, provided these activities include certain conservation measures. The majority of the proposed Project is outside of the white nose syndrome buffer zone, and so the 4(d) rule would exempt non-purposeful incidental take from all activities in these areas (USFWS 2015c). However, a portion of the proposed Project is located in Nebraska and Kansas and within the white nose syndrome buffer zone. The project could result in habitat loss and fragmentation that may impact maternity roosts and winter hibernacula. As such, the following conservation measures would be put in place consistent with the 4 (d) rule to avoid and minimize impact to the northern long-eared bat:

<u>Conservation Measure 1: Tree Removal Near Known Northern Long-eared Bat Hibernacula</u> TransCanada and associated utilities responsible for the construction of power lines to pump stations will not remove any trees within a 0.25-mile (0.4-km) buffer around known northern long-eared bat hibernacula (as determined by coordination with State Natural Heritage Inventory databases in Kansas and Nebraska, field surveys, and/or coordination with subject matter experts knowledgeable about the species).

Conservation Measure 2: Tree Removal Near Known Maternity Roost Trees

Known roost will be protected and TransCanada and associated utilities responsible for the construction of power lines to pump stations will avoid cutting or destroying of any other trees within a 150-foot (45-meter) radius from the known, occupied maternity roost trees during the pup season (June 1 through July 31) (as determined by coordination with State Natural Heritage Inventory databases in Kansas and Nebraska, field surveys, and/or coordination with subject matter experts knowledgeable about the species).



Determination

Effect on Critical Habitat

The proposed Project would not result in the destruction or adverse modification of federally designated or proposed critical habitat for the northern long-eared bat as none has yet been identified for the species. The USFWS has determined that critical habitat for the northern long-eared bat is not determinable at this time since information regarding the biological needs of the species is not sufficiently well known to permit identification of areas as critical habitat (USFWS 2015a).

Effect on the Species

The proposed Project *may affect, but is not likely to adversely affect,* the northern long-eared bat. This determination is based on Keystone's commitment to follow recommended conservation measures as identified by the USFWS in its 4(d) rule for pipeline construction, including ancillary project components (e.g., power lines to pump stations). As a result, no direct or indirect impacts are expected to result from the Project.

REFERENCES

Caceres, M.C. and R. Barclay. 2000. Myotis septentrionalis. Mammalian Species, 634: 1-4.

- DOS. See U. S. Department of State.
- Foster, R.W., and A. Kurta. 1999. Roosting ecology of the northern bat (Myotis septentrionalis) and comparisons with the endangered Indiana bat (Myotis sodalis). Journal of Mammalogy 80: 659-672.
- Harms, Robert. 2017, March 6. Information provided about distribution and habitat use in Nebraska from R. Harms (USFWS) for northern long-eared bat (*Myotis septentrionalis*).
- Henderson, L.E. and H.G. Broders. 2008. Movements and Resource Selection of the Northern Long-Eared Myotis (*Myotis septentrionalis*) in a Forest–Agriculture Landscape. Journal of Mammalogy, 89(4): 952-963.
- McNulty, Michele. 2014, May 28. Email response to information request from R. Harms (USFWS) regarding documentation, occurrence, and distribution of northern long-eared bat (*Myotis septentrionalis*).
- Menzel, M.A., S.F. Owen, W.M. Ford, J.W. Edwards, P.B. Wood, B.R. Chapman, and K.V. Miller. 2002. Roost tree selection by northern long-eared bat (*Myotis septentrionalis*) maternity colonies in an industrial forest of the central Appalachian mountains. Forest Ecology and Management 155: 107-114.
- MNHP and MFWP. See Montana Natural Heritage Program and Montana Fish, Wildlife & Parks
- Montana Natural Heritage Program and Montana Fish, Wildlife & Parks. 2012. Northern Myotis—Myotis septentrionalis. Montana Field Guide. Website: http://FieldGuide.mt.gov/detail_AMACC01150.aspx. Accessed November 5, 2012.
- Owen, S.F., M.A. Menzel, W.M. Ford, J.W. Edwards, B.R. Chapman, K.V. Miller, P.B. Wood. 2002. Roost tree selection by maternal colonies of northern long-eared myotis in an intensively managed forest.

- Prellwitz, Fritz. 2012, October 11. Email Interview. Personal communication with USFWS regarding the status of northern long-eared bat (*Myotis septentrionalis*) and swift fox (*Volpes velox*) near the Project area.
- U.S. Department of State (DOS). 2012. Keystone XL Project Final Biological Assessment. Issued December 21, 2012. 202 pp. plus appendices.

. 2014. Final Supplemental Environmental Impact Statement Keystone XL Project.

USFWS. See U.S. Fish and Wildlife Service.

U.S. Fish and Wildlife Service. 2011. Endangered and Threatened Wildlife and Plants; 90-day Finding on a Petition to List the Eastern Small-Footed Bat and the Northern Long-Eared Bat as Threatened or Endangered. June 29, 2011. Federal Register 76(125):38095-38106.

. 2013a. Biological Opinion of the effects to threatened and endangered species from the issuance of a Presidential Permit to TransCanada Keystone XL Pipeline (Keystone) by the U.S. Department of State for the proposed construction, operation, and maintenance of the Keystone XL pipeline and associated facilities at the border and interrelated and interdependent actions. Nebraska Ecological Services Field Office, U.S. Fish and Wildlife Service. 87 pp.

. 2013b. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition To List the Eastern Small-Footed Bat and the Northern Long-Eared Bat as Endangered or Threatened Species; Listing the Northern Long-Eared Bat as an Endangered Species; Proposed Rule. Federal Register 78(191): 61045-61080.

. 2014a. Northern Long-Eared Bat Interim Conference and Planning Guidance: Regions 2, 3, 4, 5, & 6. USFWS. 67 pp.

. 2014b. Northern Long-Eared Bat (Myotis septentrionalis) Proposed Listing – Memorandum Changes May 21, 2014. USFWS. Nebraska Ecological Services Field Office. 8 pp.

. 2014c. Northern Long-Eared Bat. Range Maps. USFWS Endangered Species website. http://www.fws.gov/midwest/endangered/mammals/nlba/nlebRangeMaps.html. Accessed September 3, 2014.

_____. 2015a. Listing the Northern Long-eared Bat as Threatened Questions and Answers. Website:

http://www.fws.gov/midwest/endangered/mammals/nleb/FAQsFinalListNLEB.html

_____. 2015b. Northern Long-Eared Bat Fact Sheet. Website: http://www.fws.gov/midwest/endangered/mammals/nleb/nlebFactSheet.html

. 2015c. Northern Long-Eared Bat Interim 4(d) Rule Questions and Answers. Website:

http://www.fws.gov/midwest/endangered/mammals/nleb/FAQsInterim4dRuleNLEB.html

WESTECH Environmental Services, Inc. (WESTECH). 2015. Northern Long-Eared Bat and Red Knot Habitat Assessment on the Proposed Keystone XL Pipeline Project. May 2015. Prepared for exp. Energy Services, Inc.



IN REPLY REFER TO FWS/R6/NEFO DCN 065165

United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services Nebraska Field Office 9325 South Alda Road Wood River, Nebraska 68883



March 16, 2017

FWS-NE: 2013-164

Ms. Mary D. Hassell Office of Environmental Quality and Transboundary Issues (EQT) Bureau of Oceans and International Environmental and Scientific Affairs (OES) U.S. Department of State Washington, D.C. 20520

RE: Request for Reinitiation of Section 7(a)(2) Consultation for the TransCanada Keystone XL Pipeline Project

Dear Ms. Hassell:

This is in response to your letter dated March 15, 2017, requesting reinitiation of section 7 consultation and concurrence that the proposed Keystone XL Pipeline Project (Project) may affect, but is not likely to adversely affect, the federally threatened northern long-eared bat *(Myotis septentrionalis)*. The March 15, 2017, letter also evaluates the potential for Project effects on the federally threatened Dakota skipper *(Hesperia dacotae)* and reevaluates conclusions drawn for several species, including applicability as previously considered in section 7 consultation documents. Section 7 consultation documents include the Biological Opinion (Opinion) dated May 15, 2013, the U.S. Department of State's (Department) request to reinitiate section 7 consultation for the rufa red knot (*Calidris canutus rufa*), and the U.S. Fish and Wildlife Service's (Service) August 27, 2015, concurrence with a finding of not likely to adversely affect for that species. It should be noted that the Department's request to reinitiate section 7 consultation and our response represents the culmination of many productive discussions between our agencies; this collaboration began in 2015 when the rufa red knot was listed and resumed in February 2017 with discussion about the northern long-eared bat.

Northern Long-eared Bat

The Service has reviewed the Department's March 15, 2017, letter and attached analysis of Project effects on the northern long-eared bat. In that letter, the Department and its applicant TransCanada commit to ensuring implementation of two conservation measures designed to

protect maternity roost trees and hibernacula for the species consistent with *Endangered and Threatened Wildlife and Plants; 4(d) Rule for the Northern Long-Eared Bat,* ((50 CFR Part 17, Federal Register Notice, January 14, 2016 (81 Fed. Reg. 1900)). Given the commitment to implement these conservation measures, the Service concurs with the Department's determination that the proposed Project may affect, but is not likely to adversely affect, the northern long-eared bat. Please note that the northern long-eared bat is state-listed as threatened in the States of Kansas, Nebraska, and Montana. We recommend coordination with the Nebraska Game and Parks Commission, Kansas Department of Wildlife and Parks, and Montana Fish, Wildlife, and Parks as other state requirements may apply.

Dakota Skipper

The Department completed an evaluation of the potential effects of the Project on the Dakota skipper and concluded there would be no effect on the species as there is no habitat available in the area of the Project. The Service has reviewed this evaluation as well as the best available information for the species including survey and habitat information for the Dakota skipper in South Dakota. Based on that review, we agree with the rationale utilized by the Department as it is based on a reasoned analysis of the best available information and we acknowledge the no effect determination.

Previously Considered Species

We acknowledge and appreciate the reevaluation of the species previously considered in the May 15, 2013, Opinion in addition to the rufa red knot, which was the subject of the Department's request to reinitiate section 7 consultation, dated June 9, 2015, following listing of this species as federally threatened. The Department's reevaluation was based on whether Project modifications or new information about the Project might indicate new effects to the previously considered species to the extent that reinitiation of section 7 consultation may be necessary. Based on the results of the reevaluation, the Department confirmed that the conclusions of the previous section 7 consultation documents regarding anticipated Project effects on listed species remain valid and that reinitiation of section 7 consultation is unnecessary. We agree with the Department's conclusions based on a review of the available information including Project maps and our knowledge of Project effects on these species. This is predicated on the completion of required pre-construction population surveys for the federally endangered American burying beetle (*Nicrophorus americanus*) to confirm that the amount of take authorized in the Incidental Take Statement (ITS) will not be exceeded for this species as annual populations are cyclic and dependent on weather conditions.

Greater Sage-grouse and Sprague's Pipit

The Service determined that the greater sage-grouse (*Centrocercus urophasianus*) and Sprague's pipit (*Anthus spragueii*) were not warranted for listing in October 2015 and April 2016, respectively. The May 15, 2013, Opinion identified several conservation measures for these species. Given the current status of these species, however, we confirm that these conservation measures are no longer in force. We appreciate the Department's commitment to coordinate with the Bureau of Land Management and the States of Montana and South Dakota as other requirements for these species may still apply.

The Service acknowledges the Department's recognition of its responsibilities as the recipient of the ITS as outlined in your letter and included in the May 15, 2013, Opinion. We appreciate the Department's commitment to provide the appropriate oversight of the applicant TransCanada to ensure implementation of reasonable and prudent measures, which continue to remain in force, and encourage implementation of conservation measures for the listed species. We confirm that the ITS covers incidental take caused by the applicant TransCanada provided that such take is in compliance with the ITS terms and conditions.

This concludes section 7 consultation pursuant to the Endangered Species Act. As provided in 50 C.F.R. § 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control is authorized by law and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion. The Service views the Department's March 13, 2017, request for reinitiation and this response as supplements to the May 15, 2013, Opinion.

The Service appreciates the opportunity to work cooperatively with the Department in assuming a shared responsibility for protecting federal trust fish and wildlife resources along the proposed Project route in Montana, South Dakota, Nebraska, and Kansas. If you have any questions or require technical assistance, please do not hesitate to contact Mr. Robert Harms at robert_harms@fws.gov; (308)382-6468, extension 208.

Sincerely,

Uzatin

Eliza Hines Nebraska Field Supervisor

Cc: TransCanada Corporation, Alberta, Canada (Attn: Jim White) BLM, Reno, NV (Attn: Jim Stobaugh)

Supporting Meeting Summaries, Consultation Letters and Communications

TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR	
Date/Time of Contact	June 11, 2008 / 1:27 p.m.	£
KXL Team Member(s)	Patti Lorenz	

Contact Information:

Name	Charlene Besskin
Title	Fish and Wildlife Biologist / TWS Certified Wildlife Biologist
Organization	USFWS South Dakota Field Office
Address	420 South Garfield Avenue, Suite 400 Pierre, SD 57501
County	•
Phone	(605) 224-8693 Ext. 231
Email address	Charlene_Bessken@fws.gov

Contact Information:

Type of Contact (phone, in-person, etc.): _____Email_

Issue: Data request____ Concern Level: High___Moderate_x_Low___

Description:		
See email below:		
Required Reading for Reason for StateSpecific_SD_Fly Whooping_Crane_Co		
Users of the WhoopirRedistributed Migratic way.zip nfirmed_Sightings_Th block_cleared_2005_2.zip		
Patti,		
Below are the Whooping Crane GTS materials		
berow are the whooping crane orb wateriars.		
Also the map showing that SD is block-cleared for black-footed ferrets.		
(See attached file: block_cleared_2005_2.jpg)		
Did a quick check for Swift Fox survey protocol and found none - but you could check the bibliography on the official website		
http://wildlife.state.co.us/WildlifeSpecies/GrasslandSpecies/SwiftFovConservationTeam_htm		
J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Federal\FWS\PL_CB-SDFWS_061108		

Still checking on USFW	VS easements in v	western South Dakota.	
Cheers, Charlene "Charlie" Bes Fish and Wildlife Biol USFWS South Dakota Fie 420 South Garfield Ave Pierre, SD 57501 (605) 224-8693 Ext. 23 Fax 605-224-9974	ssken Logist / TWS Cert eld Office enue, Suite 400	ified Wildlife Biologist	
Forwarded by Cha	rlene Bessken/Re	/FWS/DOI on 06/11/2008 02:20	РМ
Natalie Gates/R6/	FWS/DOI		
06/09/200 AM	98 11:36	Charlene Bessken/R6/FWS/DOIG Pete Gober/R6/FWS/DOI@FWS	To ⊉FWS cc Subject
		Fw: Final Whooper Migration	map?
Forwarded by Nat	alie Gates/R6/FW	S/DOI on 06/09/2008 11:35 AM	
Martha Tacha/R6/	FWS/DOI		То
05/28/200 PM	8 12:16	Natalie Gates/R6/FWS/DOI@FWS	cc
	·	Re: Final Whooper Migration (Document link: Natalie Gate	Subject map? es)
Hi, Natalie. Attached are the confi corridor shapefiles (z sightings entered, yet the updated file soon.	rmed sightings (ipped) for SD. , but will enter	through Fall 2007) and migrat I don't have all the Spring 2 the SD sightings first and g	ion 008 et you

The migration corridor analyses have been redone in UTM due to a glitch

 $J:\label{eq:linear} J:\label{eq:linear} J:\l$

associated with how the ArcMap software buffered the data in the geographic projection (I'm stretching myself here, so you need to refer to the attached explanation for the update/redistribution from our GIS guy, Justin). The corridor analysis is based on sightings through Spring 2007, as before. We probably won't redo that every year, since the corridors wouldn't change that much.

You need to unzip these zip files (there are seven individual files that comprise each shapefile) and then import the shapefile into a GIS (ArcMap, if you have it) in order for them to work. Do you have a GIS person in your office? Once you have the shapefiles on your system, you can manipulate them to make any sort of maps you want, export data, etc.- it's really handy.

Let me know if you need something further. I'm bunched up with a backlog of work to get through, but high on the list is re-distributing the UTM migration corridors to the ES offices in the Flyway. [You just get the first out the gate. :-)] I'm pretty backed up, but can make you a .jpg of South Dakota corridors if you need that right away.

Take care. Martha

Martha C. Tacha U.S. Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801 Phone: 308.382.6468, ext 19 Fax: 308.384.8835

(See attached file: Whooping_Crane_Confirmed_Sightings_Thru_Fall_2007.zip) (See attached file: StateSpecific_SD_Flyway.zip)(See attached file: Reason for Redistributed Migration Corridors.doc)(See attached file: Required Reading for Users of the Whooping Crane Migration GIS.doc)

Issue:

Concern Level: High Moderate Low .

Description:

Required Reading for Users of the Whooping Crane Tracking Project Database

CWCTP-GIS data or derivatives thereof (e.g., shape files, jpegs) may not be distributed or posted on the Internet without this explanatory document.

The Cooperative Whooping Crane Tracking Project (CWCTP) was initiated in 1975 to collect a variety of information on whooping crane migration through the U.S. portion of the Central Flyway. Since its inception in 1975, a network of Federal and State cooperating agencies has collected information on whooping crane stopovers and funneled it to the U.S. Fish and Wildlife Service (Service) Nebraska Field Office where a database of sighting information is maintained. The WCTP database includes a hardcopy file of whooping crane sighting reports and a digital database in various formats based on those sighting reports. A subset of the database along with sight evaluation (habitat) information collected between 1975 and 1999 was summarized by Austin and Richert (2001).*

In the Fall of 2007, the CWCTP database was converted to a GIS format (ArcGIS 9.2) to facilitate input, updates, and provide output options in a spatial context. During this process, inconsistencies between the digital database and sighting report forms were identified and corrected. Location information in various formats was derived from data in the corrected database, and new fields were added to the corrected database (e.g., latitude and longitude in decimal degrees, an accuracy field, and location comment field). The attached file contains observation data through the 2007 Fall migration and is referred to as the CWCTP-GIS (2007).

The appropriate use of the CWCTP-GIS is constrained by limitations inherent in both the GIS technology and bias inherent in any database comprised of incidental observations. Without an understanding of the assumptions and limitations of the data, analyses and output from the spatial database can result in faulty conclusions. The following assumptions and characteristics of the database are crucial to interpreting output correctly. Other, unknown biases also may exist in the data.

- First and foremost, the database is comprised of incidental sightings of whooping cranes during migration. Whooping cranes are largely opportunistic in their use of stopover sites along the Central Flyway, and will use sites with available habitat when weather or diurnal conditions require a break in migration. Because much of the Central Flyway is sparsely populated, only a small percent of stopovers are observed, those observed may not be identified, those identified may not be reported, and those reported may not be confirmed (only confirmed sightings are included in the database). Based on the crane population and average flight distances, as little as 4 percent of crane stopovers are reported. Therefore, absence of documented whooping crane use of a given area in the Central Flyway does NOT mean that whooping cranes do not use that area or that various projects in the vicinity will not potentially adversely affect the species.
- In the database, the location of each sighting is based on the first observation of the crane group even though, in many cases, the group was observed at multiple locations in a local area. For this and other reasons described below, only broad-scale analyses of whooping crane occurrences are appropriate. GIS cannot be legitimately used with this database for measurements of distance of whooping crane groups from various habitat types or

geographic entities (i.e., using various available GIS data layers). In addition, point locations of whooping crane groups known to roost in various wetlands or rivers may not coincide with those wetlands. The user needs to refer to the attribute table or contact the Nebraska Field office for more specific information on individual observations.

- Precision of the data: When a "Cadastral" location (Township, Range, Section, ¼-Section) was provided on the original sighting form, the geographic point representing that sighting was placed in the center of the indicated Section or ¼-Section and the latitude and longitude of that point were recorded in degrees, minutes, and seconds (DMS). These records are indicated by "Cadastral" in the accuracy field. When Cadastral information was lacking, DMS latitude and longitude were derived by adding seconds (00) to the degrees and minutes of latitude and longitude originally estimated and recorded on the observation form. These observations are identified by "Historic" in the accuracy field. GPS latitude and longitude were used when available, but when none of the above were reported, the point was placed on text description of location (e.g., 3 miles N of Denton), and identified in the accuracy field with "Landmark". DMS latitude and longitude were used to populate the GIS data layer.
- Bias: Bias is an inherent characteristic of any data obtained through incidental sightings. That is, for the subset of crane use that is recorded, relatively more sightings are recorded in areas such as national wildlife refuges where knowledgeable observers are available to look for cranes and report their presence. Conversely, areas of high use may not be documented due to the absence of observers. However, use of areas such as national wildlife refuges is also determined to some extent by habitat management on the areas and availability of alternative habitat in the region. For these reasons, representations of the crane migration corridor based on percent of confirmed sightings should be interpreted conservatively, particularly in Oklahoma and Kansas where a high percent of sightings occur on a few national wildlife refuges. Whooping crane migration patterns and subsequent observations were also likely influenced by regional weather patterns such as wind and precipitation, as well as local farming practices which influence food availability. Factors such as these vary among regions and years and were not considered in this database.

The CWCTP-GIS (2007) will be updated annually following the Fall migration and distributed to State cooperators and Fish and Wildlife Service Ecological Services Field Offices in the Central Flyway. Contact information for these offices can be found at http://www.fws.gov. Federal regulatory agencies and project proponents should contact the appropriate Fish and Wildlife Service for help in evaluating potential project impacts to the endangered whooping crane.

* Austin, E.A. and A.L. Richert. 2001. A comprehensive review of observational and site evaluation data of migrant whooping cranes in the United States, 1943-99. U.S. Geological Survey. Northern Prairie Wildlife Research Center, Jamestown, North Dakota, and State Museum, University of Nebraska, Lincoln, Nebraska. 157 pp.

Reason for Redistributed Migration Corridors

The intent of the frequency analysis was to define the average number of sightings that took place within certain distances of the corridor centerline. Arbitrarily, , the distance of 5 miles was chosen. Buffers were drawn in ArcMap using 5 mile increments as the buffer distance. The first series of flight corridors were buffered in the North American Datum 1983 Geographic Coordinate System. Due to that map projection, the buffers did not turn out in consistent increments. While the frequencies calculated on these buffers (and the flyways derived from these frequencies) are not incorrect, the fact that the analysis was difficult to repeat was undesirable.

The flyway analysis has now been reworked in the UTM NAD 83 ZONE 14 projection. This projection provides the expected 5 mile buffer zones, and is easier to understand and repeat. The resulting flyway corridors are very similar in width to the original analysis, but vary slightly in shape in the extreme north and south. In addition the corridors now maintain a much more consistent distance from the flyway centerline over the entire length of the flyway.



TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR	Ì
Date/Time of Contact	July 1, 2008 / 8:23 a.m.	 2 · ····
KXL Team Member(s)	Patti Lorenz (ENSR)	

Contact Information:

Name	Martin Miller
Title	Data assistant
Organization	Montana Natural Heritage Program
Address	1515 E 6 th Ave. PO Box 201800 Heiena, MT 59620-1800
County	
Phone	(406) 444-3290
Email address	Miller, Martin [martinm@mt.gov]

Contact Information:

Type of	Contact (phone, in-person	i, etc.): <u>email</u>			
lssue:	<u>Heritage data request</u>	Concern Level:	High	Moderate	Low x.

Description: Hi, Patti,

I've placed a zip file, named "XL_soc.zip", on our ftp site at: <u>ftp://nris.mt.gov/</u>. It contains shapefiles for Species of Concern (SOC), ecological sites (sites), a cover letter, explanatory material, metadata (metadata for sites is not available) and an Excel spreadsheet (gen_desc.xls) that contains habitat descriptions for data in the SOC shapefile. The data can be linked on EO_ID.

Please let me know when you have downloaded the data so I can remove it from the ftp site and let me know if you have any questions.

Thanks,

Martin Miller (406) 444-3290 Data Assistant Montana Natural Heritage Program

From: Lorenz, Patricia [mailto:plorenz@ensr.aecom.com]
Sent: Monday, June 30, 2008 3:06 PM
To: Miller, Martin
Subject: RE: Data Request for proposed pipeline project

Thank you Martin. It's on the way.

Patti Lorenz Biologist ENSR | AECOM 1601 Prospect Parkway Fort Collins, CO 80525 T: (970) 493-8878 x3410 F: (970) 493-0213 plorenz@ensr.aecom.com

From: Miller, Martin [mailto:martinm@mt.gov] Sent: Monday, June 30, 2008 11:16 AM To: Lorenz, Patricia Subject: Data Request for proposed pipeline project

data use agreement .doc

Hi, Patti,

Adam Messer passed along your request for information on Montana plant and animal species of concern. He passed along the shapefiles you emailed him and they will be helpful in processing your request.

In order to provide you with GIS information, I'm required to obtain a signed data use agreement. An example document is attached. Please read it. If it looks acceptable, sign it and fax it to me at 406-444-0581.

Let me know if you have any questions.

Thanks,

Martin Miller (406) 444-3290 Data Assistant Montana Natural Heritage Program



DEPARTMENT OF GAME, FISH AND PARKS

Foss Building 523 East Capitol Pierre, South Dakota 57501-3182

July 8, 2008

RE: TransCanada Pipeline in western South Dakota

Patti Lorenz, Biologist ENSR 1601 Prospect Parkway Fort Collins, CO 80525

Patti:

As requested, I have searched the South Dakota Natural Heritage Database for records of rare, threatened or endangered plants and animals. The enclosed CD has the shapefiles and associated data.

The lack of records for any location along the route does not indicate absence of rare or T&E species. Most of the area along the proposed pipeline has probably never been biologically surveyed.

The shapefiles show the known occurrences of rare or T&E species. The large circles do not indicate occupied habitat, instead they indicate precision of the locational data. If a record, a museum specimen for example, only gives a location such as "near Faith, SD", we use a general precision record (within five miles) and that is indicated by the large circles. Smaller circles indicate better precision.

The large polygon in the lower portion of the route is the area known to be occupied by the American burying beetle, *Nicrophorus americanus*. All of this area is potential habitat for this endangered insect. The highest population densities are in southern Tripp County and in SW Gregory County.

If you have any questions, please contact me.

Sincerely,

Doug Backlund Wildlife Biologist



DEPARTMENT OF GAME, FISH AND PARKS

Foss Building 523 East Capitol Pierre, South Dakota 57501-3182

July 8, 2008

INVOICE

ENSR 1601 Prospect Parkway Fort Collins, CO 80525

ATTN: Patti Lorenz

TOTAL	\$90.00
One computer search @ \$30.00 per search	\$30.00
1 hour of staff time @ \$30.00 per hour	\$60.00

For review of the following project sites:

TransCanada Pipeline-Western South Dakota

Make check payable to SD Dept. of Game, Fish and Parks

Submit payment to:

South Dakota Dept. of Game Fish and Park 523 E. Capitol-Foss Bldg. Pierre, SD 57501 ATTN: Doug Backlund
TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR		
Date/Time of Contact	July 9, 2008 / 11:54 a.m.	τ	
KXL Team Member(s)	Patti Lorenz (ENSR)	4-14 yr	

Contact Information:

Name	Doug Backlund
Title	
Organization	S. D. Dept. of Game Fish and Parks S.D. Natural Heritage Program
Address	523 E. Capitol-Foss Bldg. Pierre, S.D. 57501
County	
Phone	
Email address	Doug.Backlund@state.sd.us

Contact Information:

Type of Contact (phone, in	n-person, etc.):	<u>email</u>	
----------------------------	------------------	--------------	--

Issue:	Geotech Work	Concern Level:	High <u>x</u>	_Moderate	Low
--------	--------------	----------------	---------------	-----------	-----

Description:

Patti:

It is unlikely that there are any state or federal listed species that would be disturbed. Keep in mind that this work is scheduled within the whooping crane migration period. It is very unlikely that whooping cranes would show up at one of these sites, but it is possible.

Doug

Doug Backlund S. D. Dept. of Game Fish and Parks S.D. Natural Heritage Program 523 E. Capitol-Foss Bldg. Pierre, S.D. 57501 <u>http://www.sdgfp.info/wildlife/diversity/Index.htm</u> -----Original Message-----**From:** Lorenz, Patricia [mailto:plorenz@ensr.aecom.com]

Sent: Thursday, September 11, 2008 12:42 PM

To: Charlene_Bessken@fws.gov; Kirk, John (GFP, Pierre); Backlund, Doug

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\SD\DB_SDGFP_PL_091108.doc

Subject: KXL - Request for information regarding geotechnical work

Charlie, John, and Doug:

KXL would like to begin geotechnical investigations at proposed HDD locations along the route. They would like to conduct the work between October 13 and November 13, 2008. Below is a description of the work that will be conducted:

"Geotechnical investigations - In specific areas, such as large river or road crossings, geotechnical teams would identify subsurface soil and bedrock characteristics. At these geotechnical bore sites, a truck-mounted drilling rig would drill a three- to six-inch-diameter hole and obtain soil and bedrock samples. Typically, two to four small trucks with trailers support this work. If required, TransCanada would request landowner permission to move heavy equipment to and from the survey site. After completion, the boreholes are completely back-filled, and the work site restored."

I would like to request any information on potential T&E / wildlife conflicts and any corresponding mitigation or permits required. Attached are maps of the locations for these investigations. Please give me a call with any questions or concerns. Thank you for your attention to this request.

Sincerely,

Patti Lorenz Biologist ENSR | AECOM 1601 Prospect Parkway Fort Collins, CO 80525 T: (970) 493-8878 x3410 F: (970) 493-0213 plorenz@ensr.aecom.com

Follow-up Required / Requested

Additional Comments

TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR	
Date/Time of Contact	July 9, 2008 / 11:54 a.m.	
KXL Team Member(s)	Patti Lorenz (ENSR)	

Contact Information:

Name	Doug Backlund
Title	· · · ·
Organization	S. D. Dept. of Game Fish and Parks S.D. Natural Heritage Program
Address	523 E. Capitol-Foss Bldg. Pierre, S.D. 57501
County	
Phone	
Email address	Doug.Backlund@state.sd.us

Contact Information:

Type of Contact	(phone,	in-person,	etc.):	email	

Issue: <u>He</u>	<u>eritage data request</u>	Concern Level:	High	_Moderate	Low x .
------------------	-----------------------------	----------------	------	-----------	---------

Description:

Patti:

I have searched the SD Natural Heritage Database for records of rare, threatened and endangered plants and animals in a five-mile buffer along the TransCanada pipeline route. I will send the shapefiles and associated data table along with an invoice.

The only critical habitat that has been designated by the FWS in SD is along the Missouri River and all outside of the project area, to the best of my knowledge. However, you should verify that with the US FWS.

I do not have data or shapefiles for locations of big game ranges, federal and state owned properties or state and federal conservation easements. I'm cc'ing (and forwarding the shapefiles for the pipeline route) to Chris Marsh, our agency GIS specialist. He will be able to help you with the state land ownership and easement layers. You will need to contact the US FWS for the federal conservation easements.

As far as data on big game ranges, I'd recommend contacting Tom Kirschenmann (phone: 605) 773-4193 <u>Tom.Kirschenmann@state.sd.us</u>). Tom is our game staff specialist and will be able to answer questions regarding big game ranges.

Let me know if you have any further questions.

Doug

Doug Backlund S. D. Dept. of Game Fish and Parks S.D. Natural Heritage Program 523 E. Capitol-Foss Bldg. Pierre, S.D. 57501

http://www.sdgfp.info/wildlife/diversity/Index.htm

-----Original Message----- **From:** Lorenz, Patricia [mailto:plorenz@ensr.aecom.com] **Sent:** Thursday, June 19, 2008 12:10 PM **To:** Backlund, Doug **Subject:** RE: swift fox survey protocol

Hello Doug,

I wanted to check in with you regarding a heritage data request. In order to address potential impacts to aquatic and terrestrial plant and animal species, ENSR would like to request occurrence data, including shapefiles, for:

- Federally listed, proposed, and candidate species;
- Designated critical habitat of federally listed species;
- State listed or state sensitive species;
- Locations of big game ranges; and
- Unique ecosystems or sensitive communities.

Because of the mobility of wildlife species, ENSR would like to request sensitive wildlife information 5 miles beyond the proposed project boundary. We also would like to request sensitive plant data 3 miles beyond the proposed project boundary.

In addition, ENSR would like to request occurrence data, including shapefiles, for:

- Federal and state owned properties; and
- Properties with federal and state conservation easements.

Thank you for your help with this data request. ENSR would be happy to comply with any confidentiality agreements required to obtain this data. I have attached the shapefile of the proposed route through South Dakota. Let me know if you need any additional information.

Thank you,

Patti Lorenz Biologist ENSR | AECOM 1601 Prospect Parkway Fort Collins, CO 80525 T: (970) 493-8878 x3410 F: (970) 493-0213 plorenz@ensr.aecom.com

TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR	,
Date/Time of Contact	October 8, 2008 / 1:18 p.m.	
KXL Team Member(s)	Patti Lorenz	

Contact Information:

Name	John Cochnar
Title	Assistant Field Supervisor
Organization	U. S. Fish and Wildlife Service
Address	203 West Second Street Grand Island, NE 68801
County	
Phone	Office: (308) 382-6468. Ext. 20 Cell: (308) 379-8550
Email address	John_Cochnar@fws.gov

Contact Information:

Type of Contact (phone, in-person, etc.):email	
------------------------------------------------	--

Issue: <u>Geomorph/Geotech Work</u> Concern Level: High<u>x</u>Moderate_Low_.

Description:

2009-004_Keystone)	
Patti:	
As we discussed, attached is a US Fish and Wildlife Service letter	
cranes on the Niobrara and Cedar rivers. Please contact me if you	100ping
questions.	11476
(See attached file: FWS-NE 2009-004_Keystone XLpdf)	
John Cochnar	
Deputy Nebraska Field Supervisor	
Deputy Mediaska Fleta Supervisor	
0.5. FISH and WHATTLE SERVICE	

10/08/2008 01:02 PM

203 West Second Street

Subject

KXL - Geotech locations/access roads

John,

I just spoke with Kristal about the use of access roads for the upcoming geotech work and she concurred the use of those roads would not have any negative impacts on fish and wildlife resources. Do you agree? Let me know, they would like to begin work on Monday if possible.

On a side note, I am having difficulties with my email. They changed our email address but the new one seems to have some bugs. If you have trouble with it, please use the old email address: plorenz@ensr.aecom.com.

Thanks,

Patti Lorenz Wildlife Biologist ENSR | AECOM 1601 Prospect Parkway Fort Collins, CO 80525 T: (970) 493-8878 x3410 F: (970) 493-0213 patricia.lorenz@aecom.com

PLEASE NOTE NEW EMAIL ADDRESS



United States Department of the Interior

FISH AND WILDLIFE SERVICE Ecological Services Nebraska Field Office 203 West Second Street Grand Island, Nebraska 68801

October 8, 2008

FWS-NE: 2009-004

Patti Lorenz ENSR | AECOM 1601 Prospect Parkway Fort Collins, CO 80525

RE: Proposed Geomorphological Test Pits for the Keystone XL Pipeline, Rock, Keya Paha, and Wheeler Counties, Nebraska

Dear Ms. Lorenz:

This responds to your September 30, 2008, request to the U.S. Fish and Wildlife Service (Service) regarding the subject project. The Service has responsibility for conservation and management of fish and wildlife resources for the benefit of the American public under the following authorities: 1) Endangered Species Act of 1973 (ESA), 2) Fish and Wildlife Coordination Act (FWCA), 3) Bald and Golden Eagle Protection Act (The Eagle Act), and 4) Migratory Bird Treaty Act (MBTA). The National Environmental Policy Act (NEPA) requires compliance with all of these statutes and regulations.

ENDANGERED SPECIES ACT

Proposed Project

Pursuant to section 7 of ESA, every federal agency, in consultation or conference with the Service, is required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any federally listed or proposed species and/or result in the destruction or adverse modification of designated and/or proposed critical habitat. In accordance with section 7(a)(2) of ESA, the lead federal agency or its designated representative should determine if any federally listed threatened or endangered species and/or designated/proposed critical habitat would be directly and/or indirectly affected by this proposed project. The assessment of potential impacts (direct and indirect) must include an "effect" or "no effect" determination and be presented to the Service in writing. If the Service agrees with the determination, this office would provide a letter of concurrence. If federally listed species and/or designated/proposed critical habitat would be adversely affected by this action, the lead federal agency would need to formally request further section 7 consultation with the Service prior to making any irretrievable or irreversible commitments of resources in support of the proposed highway construction project.

In accordance with section 7 of ESA, the Service has determined that the following federally listed species may occur in the proposed project area or be affected by the proposed project:

I iste	d Sn	ecies	
LISTE	a spe	ectes.	

Whooping crane (Grus americana)

Roosting, migrant

Whooping Crane

Whooping cranes, federally listed as endangered, use shallow, sparsely vegetated streams and wetlands in which to feed and roost during migration. Migration periods for the whooping crane in Nebraska are from approximately March 23 through May 10 and from September 16 through November 16. Major river systems used by whooping cranes in Nebraska include the Platte, Loup, Republican, Cedar, and Niobrara rivers. Additionally, a 3-mile-wide, 56-mile-long reach of the Platte River between Lexington and Denman, Nebraska has been federally designated as critical habitat for whooping cranes. Whooping cranes can be disturbed by sight (human figures, equipment within sight) and sound (loud equipment, banging, etc.) that are abnormal (roadway traffic is normal), therefore surveys are needed to ensure disturbance is minimized.

The Service recommends that the project proponent implement the following Conservation Measures when work activities are to be conduct on the Niobrara River (Rock and Keya Paha Counties) and on the Cedar River (Wheeler County) to avoid disturbing roosting whooping cranes.

Time of Survey:

- 1. Prior to sunrise (published clock time) to make use of the beginning daylight hours, record start and stop time
- 2. Evening survey (after 4:00 pm) to check for birds potentially coming into roost
- 3. Do east side of river first to reduce glare from sun.

Method of Survey:

- 1. Look at all up and down stream channels as far as you can see
- 2. Use binoculars or spotting scope
- 3. Watch for at least 15 minutes overall
 - a. Look for bird movements possibly moving within channel among vegetation
 - b. Look for whooping cranes among sandhill crane groups or other bird species
- 4. If cloudy, overcast or foggy and visibility is reduced to below 0.5 miles, allow time for fog to clear- take additional time to ensure the best survey possible.
- 5. Keep of record of surveys including start/stop times, weather conditions, surveyor(s), results of surveys, etc.

If Whooping Cranes are not seen during the morning survey, work may begin after completion of the survey.

If Whooping Cranes are spotted within 0.5 miles of the active construction:

- 6. Do not start work.
- 7. Stop work if seen at times other than the morning survey.
- Contact John Cochnar (Service) (office phone (308) 382-6468, extension 20 or cell phone (308) 379-8550) and Kristal Stoner (Nebraska Game and Parks Commission (402) 471-5444) immediately.

Provided these Conservation Measures are implemented, the Service concurs that the proposed activities for the Keystone XL Pipeline Project may affect but not likely to adversely affect the endangered whooping crane.

The Service appreciates the opportunity to provide comments on this proposed project Should 'you have any questions regarding these comments, please contact me at john_cochnar@fws.gov or (308) 382-6468, extension 20.

Sincerely,

John Cochner

John Cochnar Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Kristal Stoner)

3

TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	ENSR		`
Date/Time of Contact	April 16, 2009 / 3:00 p.m.	E Constantino de la c	
KXL Team Member(s)	Patti Lorenz		

Contact Information:

Name	Lou Hanebury
Title	Fish and Wildlife Biologist
Organization	U. S. Fish and Wildlife Service
Address	Ecological Services Billings Sub Office 2900 4 th Ave. N., Suite 301 Billings, MT 59101-1228
County	
Phone	(406) 247-7367
Email address	Lou_hanebury@fws.gov

Contact Information:

	Туре	of	Contact	(phone,	in-person,	etc.):	phone
--	------	----	---------	---------	------------	--------	-------

ssue: <u>SSS surveys/mitigation</u>	Concern Level:	High X	_Moderate_	_Low_	
-------------------------------------	----------------	--------	------------	-------	--

Description:

Meeting requests to finalize special status species survey protocols and mitigation measures were sent to Lou on 12/22/08 and on 1/12/09 without a response. On April 16, 2009, I sent Lou an email containing the information discussed with MFWP and BLM on 2/3/09 and 2/5/09 for input from the Montana FWS. Lou called me at 3:00 p.m. to discuss. The following is a summary of the phone conversation:

Regarding the Survey Protocol Document: Raptors:

Lou concurs with the protocol.

Bald Eagles:

The Yellowstone and Missouri River is the only known location for bald eagle nests along the route in Montana. If nests are found in other locations, please notify Alison Begly or Christy Duboise (MFWP).

Golden Eagles:

Golden eagle populations are declining in Montana. They are known to nest along the route in ponderosa pine

 $J:\label{eq:logical} J:\label{eq:logical} J:\labe$

forests and badland areas.

Interior least tern:

Terns are found along the project route at the Yellowstone River only. I summarized my discussions with Arnold Dood (MFWP) and the decision to conduct surveys prior to construction only in coordination with MFWP annual surveys. I mentioned that MFWP surveys that stretch of river each year and will provide us with the results.

Lou recommended changing the buffer from 0.25 miles from a nest site to line-of-sight. This might mean more than 0.25 mile.

Piping Plover:

The piping plover is a transient only on the Yellowstone River. Also, I spoke to Lou regarding the need to conduct surveys for nesting plovers in Valley County as originally recommended in 2008. I described the habitat based on the 2008 wetland/waterbody surveys and informed him that the habitat crossed by the route was not suitable for nesting plovers. Lou also mentioned that surveys have been conducted in Valley County but nesting plovers have never been identified. Therefore, Lou does not recommend surveys for piping plovers in Valley County. He also recommends conducting incidental surveys for individual plovers while conducting the interior least tern surveys at the Yellowstone River.

Burrowing Owl:

Lou mentioned that even though MFWP recommends surveys within all small mammal burrows, he recommends conducting surveys for burrowing owls within prairie dog towns only. It is very rare for a burrowing owl to be found in other mammal burrows. He mentioned that if an occupied burrowing owl nest is found within the ROW, it is considered "take" according to the MBTA to destroy that nest at any time of the year (i.e., including outside of the breeding season). If an occupied nest is identified, we need to contact the FWS for further mitigation measures.

Mountain Plover:

Lou recommends surveys for the mountain plover in prairie dog towns and bentonite fields in Valley County only. I mentioned that we do not cross any bentonite fields and only two prairie dog towns in Montana. I also mentioned that MFWP said that they would send me their survey transects for mountain plover. Lou was unaware that MFWP had survey transects. Lou is unsure of the exclusion window of May 1 – June 15. He will look into it and get back to me.

<u>Greater Sage-grouse/Sharp-tailed Grouse:</u> Lou defers all recommendations to MFWP and the BLM.

Black-footed Ferret:

Surveys will only be necessary for very large prairie dog towns. Send information on towns to Lou for additional mitigation requirements.

Pallid Sturgeon:

Lou agrees that there will be no impacts to the pallid sturgeon due to the project.

TransCanada – KXL Phase II Pipeline Contact Summary Form

Communication Location	Phone	
Date/Time of Contact	June 25, 2009 / 10:00 a.m.	
KXL Team Member(s)	Patti Lorenz	

Contact Information:

Name	Charlene Besskin
Title	Fish and Wildlife Biologist / TWS Certified Wildlife Biologist
Organization	USFWS South Dakota Field Office
Address	420 South Garfield Avenue, Suite 400 Pierre, SD 57501
County	
Phone	(605) 224-8693 Ext. 231
Email address	Charlene_Bessken@fws.gov

Contact Information:

Type of Contact (phone, in-person, etc.): ____ Phone___

Issue: 2009 Geotech locations Concern Level: High x Moderate x Low .

Description:

Information requesting agency concurrence for biological clearance for the 2009 geotech activities in Nebraska and South Dakota was sent to Charlene on 6/24/09. Charlene called me with concerns for the southern Tripp County location at MP 581.36, US 183. This location is within the known range of the American burying beetle in South Dakota. Charlene advises that the work should wait until after August to be conducted, reducing impacts to active beetles. All other locations are clear for geotech work in July.

Charlene also asked when the DOS was going to initiate consultation with the USFWS. I gave her an update on the BA and informed her that a draft BA was going to be filed with the DOS in the near future. I also clarified that the DOS/Entrix would be responsible for submitting the BA and that it would most likely be filed with the EIS.

Finally, Charlene said that the USFWS in SD would be leaning to a "likely to adversely affect but non jeopardy" finding for the beetle in South Dakota.

Jennifer Isett

From:	
Sent:	
To:	
Subject:	
Attachments:	

Jennifer Isett Monday, December 13, 2010 11:41 AM Keystone XL FW: blowout penstemon blowout penstemon distr in NE.doc

From: Martha Tacha@fws.gov [mailto:Martha Tacha@fws.gov] Sent: Monday, November 29, 2010 7:12 AM To: Lynn Noel Cc: John Cochnar@fws.gov Subject: blowout penstemon

Hi, Lynn.

Attached is a brief excerpt from the draft 5-yr review of the blowout penstmon. This Dec 2008 information is from Dr. James Stubbendieck, the Nebraska authority on the species, and is the most up-to-date we have. As you can see, there is a population of the plant in Rock County, but it is substantially west of the proposed pipeline route. In addition, I anticipate pipeline construction would avoid active, open sand blowouts (b. penstemon habitat) for a number of reasons unrelated to the endangered plant. Therefore, I don't anticipate adverse affects to the endangered plant from the proposed project.

Hope you had a good Thanksgiving break.

Martha

Martha C. Tacha U.S. Fish and Wildlife Service 203 West Second Street Grand Island, NE 68801 Phone: 308.382.6468, ext 19 Fax: 308.384.8835

(See attached file: blowout penstemon distr in NE.doc)

2.3.1.2 Distribution, abundance, and population trends (e.g. increasing, decreasing, stable), demographic features (e.g., age structure, sex ratio, family size, birth rate, age at mortality, mortality rate, etc.), or demographic trends

Blowout penstemon are found in the Sandhills region of north central Nebraska and the northeastern Great Divide Basin in Carbon County, Wyoming- (Figures 2 and 3) (Kottas 2008, Heidel et al. 2007). The Nebraska Sandhills is an area of stabilized sand dunes covering 5 million hectaures (approximately 12.4 million acres) in north central Nebraska (Figure 2). Currently 32 blowout penstemon populations groups (i.e., 10 native sites and 22 introduced populations) occur in the Sandhills region of Nebraska (Stubbendieck 2008) (Figure 2).



Figure 2. Location of blowout penstemon population groups and the Sandhills region in Nebraska. (Source: Jim Stubbendieck, 2008, used with permission).

ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

April 18, 2008

Ms. Carey Grell Environmental Analyst Realty and Environmental Services Division Nebraska Game and Parks Commission 2200 N 33rd St. Lincoln, NE 68503

Dear Ms. Grell:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

Project Description

As outlined during our recent meeting, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in May 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone

Carey Grell April 18, 2008 Page 2

XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre-Construction Notification (PCN) requirements. These surveys will cover a comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native landscapes) that have been identified through high-resolution aerial photography reviews and pre-construction notification (PCN) requirements of the ACOE. We have included a table of locations that will be surveyed as a part of this overall habitat assessment effort. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats, and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials:

- Special Status Species Screening Table This document includes all special status species that have the potential to occur within the project area through the detailed reviews mentioned above. It assisted us in determining the need for surveys and the locations of those surveys for each species. Your review, input, and concurrence with these proposed survey areas is imperative, and future consultations will be based on this information.
- CD containing shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to BLM offices in Montana, FWS field offices in Montana, South Dakota, Nebraska, and Kansas; and to the appropriate state wildlife agencies in each state. Because our habitat assessment surveys and wetland delineations are scheduled to begin in May 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. ENSR will be meeting with you at your earliest convenience to discuss this material in further detail and to request your concurrence with our proposed survey protocols. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email spatti@ensr.aecom.com or plorenz@ensr.aecom.com. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti Project Manager

PL/SJP/

Ref: 10623-007

Enc: Special Status Species Screening Table Nebraska Comprehensive Survey Location Table Shapefiles of the proposed centerline (including mileposts, and permanent and temporary easements) ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

April 21, 2008

Mr. Craig Haynes U.S. Bureau of Land Management 5001 Southgate Drive Billings, MT 59101

Dear Mr. Haynes:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting feedback and concurrence from BLM biologists on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

Project Description

As outlined during our recent meeting, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in May 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre-Construction Notification (PCN) requirements. These surveys will cover a comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native

Craig Haynes April 21, 2008 Page 2

landscapes) that have been identified through high-resolution aerial photography reviews and PCN requirements of the ACOE. We have included a table of locations that will be surveyed as a part of this overall habitat assessment effort. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats, and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials:

- Special Status Species Screening Table This document includes all special status species that
 have the potential to occur within the project area through the detailed reviews mentioned above.
 It assisted us in determining the need for surveys and the locations of those surveys for each
 species. Your review, input, and concurrence with these proposed survey areas is imperative,
 and future consultations will be based on this information.
- Shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to FWS field offices in Montana, South Dakota, Nebraska, and Kansas, and to the appropriate state wildlife agencies in each state. Because our habitat assessment surveys and wetland delineations are scheduled to begin in May 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. ENSR will be meeting with you at your earliest convenience to discuss this material in further detail and to request your concurrence with our survey protocols. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti Project Manager

PL/SJP/

Ref: 10623-007

Enc: Special Status Species Screening Table Montana Comprehensive Survey Location Table Shapefiles of the proposed centerline (including mileposts, and permanent and temporary easements) April 21, 2008

Mr. John Cochnar U.S. Fish and Wildlife Service Ecological Services Field Office 203 West Second Street Federal Building, Second Floor Grand Island, NE 68801

Dear Mr. Cochnar:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

Project Description

As outlined during our recent meeting, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in May 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of

John Cochnar April 21, 2008 Page 2

Engineers (ACOE) Pre-Construction Notification (PCN) requirements. These surveys will cover a comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native landscapes) that have been identified through high-resolution aerial photography reviews and PCN requirements of the ACOE. We have included a table of locations that will be surveyed as a part of this overall habitat assessment effort. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats, and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials:

- Special Status Species Screening Table This document includes all special status species that
 have the potential to occur within the project area through the detailed reviews mentioned above.
 It assisted us in determining the need for surveys and the locations of those surveys for each
 species. Your review, input, and concurrence with these proposed survey areas is imperative,
 and future consultations will be based on this information.
- CD containing shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to BLM offices in Montana, FWS field offices in Montana, South Dakota, and Kansas; and to the appropriate state wildlife agencies in each state. Because our habitat assessment surveys and wetland delineations are scheduled to begin in May 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. ENSR will be meeting with you at your earliest convenience to discuss this material in further detail, and to request your concurrence with our proposed survey protocols. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti Project Manager

CB/SJP

Ref: 10623-007

Enc: Special Status Species Screening Table Nebraska Comprehensive Survey Location Table Shapefiles of the proposed centerline (including mileposts, and permanent and temporary easements) ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

April 21, 2008

Mr. Lou Hanebury U. S. Fish and Wildlife Service Montana Field Office 2900 4th Avenue North #301 Billings, Montana 59101-1228

Dear Mr. Hanebury:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

AECOM

Project Description

As outlined during a recent meeting in Helena, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in May 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre-Construction Notification (PCN) requirements. These surveys will cover a

Lou Hanebury April 21, 2008 Page 2

comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native landscapes) that have been identified through high-resolution aerial photography reviews and PCN requirements of the ACOE. We have included a table of locations that will be surveyed as a part of this overall habitat assessment effort. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats, and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials:

- Special Status Species Screening Table This document includes all special status species that have the potential to occur within the project area through the detailed reviews mentioned above. It assisted us in determining the need for surveys and the locations of those surveys for each species. Your review, input, and concurrence with these proposed survey areas is imperative, and future consultations will be based on this information.
- Shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to BLM offices in Montana, FWS field offices in South Dakota, Nebraska, and Kansas; and to the appropriate state wildlife agencies in each state. Because our habitat assessment surveys and wetland delineations are scheduled to begin in May 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. ENSR will be meeting with you at your earliest convenience to discuss this material in further detail, and to request your concurrence with our surveys protocols. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti Project Manager

CB/SJP

Ref: 10623-007

Enc: Special Status Species Screening Table Montana Comprehensive Survey Location Table Shapefiles of the proposed centerline (including mileposts, and permanent and temporary easements) ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

April 21, 2008

Mr. T.O. Smith Montana Fish, Wildlife, and Parks 1420 E 6th Avenue Helena, MT 59620-0701

Dear Mr. Smith:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

Project Description

As outlined during a recent meeting in Helena, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in May 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre-Construction Notification (PCN) requirements. These surveys will cover a comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native

T.O. Smith April 21, 2008 Page 2

landscapes) that have been identified through high-resolution aerial photography reviews and PCN requirements of the ACOE. We have included a table of locations that will be surveyed as a part of this overall habitat assessment effort. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats, and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials:

- Special Status Species Screening Table This document includes all special status species that
 have the potential to occur within the project area through the detailed reviews mentioned above.
 It assisted us in determining the need for surveys and the locations of those surveys for each
 species. Your review, input, and concurrence with these proposed survey areas is imperative,
 and future consultations will be based on this information.
- Shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to Montana FWS field office and Montana BLM field offices. Because our habitat assessment surveys and wetland delineations are scheduled to begin in May 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. ENSR will be meeting with you at your earliest convenience to discuss this material in further detail and to request your concurrence with our survey protocols. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti Project Manager

CB/SJP

Ref: 10623-007

Enc: Special Status Species Screening Table Montana Comprehensive Survey Location Table Shapefiles of the proposed centerline (including mileposts, and permanent and temporary easements) ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

May 29, 2008

Ms. Charlene Bessken U. S. Fish and Wildlife Service 420 S. Garfield Avenue, Suite 400 Pierre, SD 57501-5408

Dear Ms. Bessken:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

ECOM

Project Description

As outlined during our recent meeting, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre- Construction Notification (PCN) requirements. These surveys will cover a

Charlene Bessken May 29, 2008 Page 2

comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native landscapes) that have been identified through high-resolution aerial photography reviews and preconstruction notification (PCN) requirements of the ACOE. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials and asking for your review of the proposed actions:

- Special Status Species Screening Table This document includes all special status species that
 have the potential to occur within the project area through the detailed reviews mentioned above.
 It assisted us in determining the need for surveys and the locations of those surveys for each
 species. Your review, input, and concurrence in this area is imperative and future consultations
 will be based on this information.
- Shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to the South Dakota Game Fish and Parks office. Because our habitat assessment surveys and wetland delineations are scheduled to begin May, 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. Thank you for agreeing to meet with us to discuss this material in further detail. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti

Project Manager

PL/SJP/

Ref: 10623-007

Enc: Special Status Species Screening Table Shapefiles of the proposed centerline

ENSR 1601 Prospect Parkway, Fort Collins, Colorado 80525 T 970.493.8878 F 970.493.0213 www.ensr.aecom.com

May 29, 2008

Mr. John Kirk South Dakota Game Fish and Parks 523 East Capitol Avenue Pierre, SD 57501

Dear Mr. Kirk:

At this time, ENSR Corporation (ENSR) is providing you with information regarding the implementation of the biological survey program for the TransCanada Keystone XL Project (Project), and requesting your feedback and concurrence on certain proposed actions. Keystone has requested that ENSR be designated as the non-federal representative for the Bureau of Land Management (BLM) under Section 7 of the Endangered Species Act. As with the Keystone project, it is expected that BLM will approve this role so that we can help facilitate the consultation process.

Project Description

As outlined during our recent meeting, the Keystone XL Project is a proposed pipeline to transport crude oil from fee property of TransCanada located in Heartland, Alberta, Canada, to Nederland, Texas, and the Houston Ship Channel area of Texas, in the United States (U.S.). The current, planned delivery points will be located in Nederland, Texas, and the Houston Ship Channel area in Texas. The Keystone XL Project will originate with a nominal throughput of 700,000 barrels per day (bpd) with the possibility of an ultimate nominal capacity of 900,000 bpd.

The Canadian component of the Project consists of 329 miles of new 36-inch pipeline co-located approximately 87 percent with the existing TransCanada system and approximately 13 percent with other existing linear disturbances for a total of 100 percent. In Canada, the Project will require three tanks each with a capacity of 350,000 barrels, three metering facilities, and 13 pump stations.

The U.S. component of the Project consists of approximately 1,375 miles of new 36-inch-diameter pipeline which does not include the 298 miles of 36-inch pipeline constructed under the initial Keystone Project to extend the separate and ongoing Keystone Project from Steele City, Nebraska, to Cushing, Oklahoma in the U.S (known as the Cushing Extension). The permitting and construction of the Cushing Extension has been analyzed in the National Environmental Policy Act (NEPA) process for the Keystone Project, and is not included in the scope of this Project.

In the U.S., the Project will require six tanks each with a capacity of 350,000 barrels. Three would be located at Steele City, Nebraska, and three would be located at either the junction point off the Keystone XL mainline for the Houston Lateral or at the end of the Houston Lateral. Metering facilities would be installed at delivery points at Cushing, Nederland, and at the end of the Houston Lateral. Thirty new pump stations will be installed along the pipeline in the U.S.

Phase 1 (Oklahoma and Texas) is scheduled to be in service by the fourth quarter of 2010 with Phase 2 (Montana, South Dakota, and Nebraska) by the fourth quarter of 2011.

Biological Survey Program

General habitat assessments and Wetland/Waterbody delineation surveys will be initiated in 2008 to fine-tune identified habitat for special status species potentially located along the proposed Keystone XL Project route as well as to identify wetlands and waterbodies that have met U.S. Army Corps of Engineers (ACOE) Pre- Construction Notification (PCN) requirements. These surveys will cover a

John Kirk May 29, 2008 Page 2

comprehensive list of ecological areas (e.g. wetlands/waterbodies, prairie dog colonies, and native landscapes) that have been identified through high-resolution aerial photography reviews and preconstruction notification (PCN) requirements of the ACOE. The results of the comprehensive habitat surveys will be used to help fine-tune the currently proposed species-specific survey locations.

Species-specific biological surveys also will be conducted in 2008 and 2009 for several species potentially located along the Keystone XL Project route. We are including a table of special status species that may be impacted by the proposed project for your review and concurrence. These species, sensitive species habitats and proposed survey locations have been determined through federal and state agency website searches, document reviews, and high-resolution aerial photography interpretation. Consultations with agency personnel have not occurred to date; therefore, the biological survey program requires your review and concurrence. To facilitate your review of the Keystone XL project biological survey program, ENSR is providing you with the following materials and asking for your review of the proposed actions:

- Special Status Species Screening Table This document includes all special status species that have the potential to occur within the project area through the detailed reviews mentioned above. It assisted us in determining the need for surveys and the locations of those surveys for each species. Your review, input, and concurrence in this area is imperative and future consultations will be based on this information.
- Shapefiles of the proposed project centerline.

Copies of these materials also are being distributed to the FWS field office in South Dakota. Because our habitat assessment surveys and wetland delineations are scheduled to begin May, 2008, we are sincerely hoping that the enclosed materials will provide you with enough detail to confirm survey locations and methodologies. Thank you for agreeing to meet with us to discuss this material in further detail. If you have any questions regarding the enclosed materials, please contact Patti Lorenz or me at (970) 493-8878 or email <u>spatti@ensr.aecom.com</u> or <u>plorenz@ensr.aecom.com</u>. We truly appreciate your prompt assistance.

Sincerely,

Scott J. Patti

Project Manager

PL/SJP/

Ref: 10623-007

Enc: Special Status Species Screening Table Shapefiles of the proposed centerline

Steele City Meeting Notes

Meeting Notes USFWS/NGPC Meeting May 5, 2008 2:00 – 3:40 Lincoln, NE

U.S. Fish and Wildlife Service (USFWS) – Grand Island, NE Field Office Nebraska Game and Parks Commission (NGPC)

Attendees:

John Cochnar (USFWS) Rick Schneider (NGPC) Kristal Stoner (NGPC) Carey Grell (NGPC) Mike Fritz (NGPC) Scott Patti (ENSR) Patti Lorenz (ENSR)

Purpose:

To gather information about special status species that may be impacted by the TransCanada proposed oil pipeline project and review proposed species specific surveys.

Project Updates

- The project route is not firm and will change;
- Aerial raptor surveys were conducted in April and included 100% cover of the proposed right-of-way (ROW) to date;
- Ground surveys for wetland/waterbodies and sensitive habitats (e.g. prairie dog towns) will begin at the end of May.

Survey tables/schedules/protocols were developed through public information without agency consultation. Sources included USFWS and NGPC websites and the NGPC Wildlife Conservation Strategy.

Q (RS): Will NGPC get the results of survey work? NGPC did not see any results for either the REX-West or Keystone Pipelines.

A (ENSR): We will need to look into this. There is no reason why the agencies shouldn't see the results of the surveys.

Species Specific Information

Black-footed Ferret: No surveys required

River Otter: Surveys Required

Add the following recommended locations to the Species Screening Table for the river otter:

- Niobrara River (release site upstream of KXL crossing);
- NF Elkhorn River;
- Elkhorn River; and
- Loup River (records exist in Mellete County).

HDD would prevent impacts to river otters. Surveys should focus on denning sites. It is possible to conduct denning habitat surveys in the winter prior to the denning season if the surveyor is qualified to identify otter signs (e.g. slides).

Bald Eagle: Surveys Required

Bald eagle surveys are included in the aerial raptor surveys. 100% cover of the route is recommended because bald eagle nests in Nebraska have been documented along smaller than typical waterbodies. Also, bald eagles have been documented utilizing dense cedar stands for winter roost sites. Bald eagle numbers are increasing in Nebraska and plans to de-list the species as state threatened are scheduled for October 2008. Consider winter roost surveys in addition to nesting surveys. In Nebraska, winter roost sites can consist of two types of habitat:

- 1. Stands of cottonwood trees along waterbodies; and
- 2. Stands of dense cedar trees along waterbodies (e.g. Loup and Cedar Rivers).

Whooping Crane: Surveys Required

If construction is to occur during the spring and fall migrations within known stop-over locations, surveys in those areas should be conducted to determine presence/absence before commencing any daily construction. Once the locations for construction have been determined and wetland/waterbody surveys have been conducted, the USFWS and NGPC will provide know location information to allow surveys prior to the start of any construction activity that day in that area. If a whooping crane is identified, construction activities will be delayed until the individual(s) have left. In addition, if a crane is identified, the USFWS will immediately be notified and a 1 mile buffer from any disturbance will be applied. Finally, all staging areas and equipment storage areas should be located away from the known stop-over areas.

For facilities requiring transmission lines, requirements will include either marking those lines or burying the lines within whooping crane migration routes.

Piping Plover: Surveys Required

Note all critical habitat in NE has been vacated and will not be treated as such. The South Fork Elkhorn River can be eliminated from the table. Survey locations will remain as the Niobrara, Platte, and Loup Rivers.

Interior Least Tern: <u>Surveys Required</u> See notes for Piping Plover – same locations.

Blacknose Shiner, Northern Redbelly Dace, and Finescale Dace: Surveys Required

NGPC would like surveys for these species within all small streams in Rock County in addition to the Holt Creek location in Keya Paha County. Focus on tributaries of the Niobrara River and the South Fork Elkhorn River.

Comment (SJ): Surveys at all stream locations in Rock County may lead to further discussions regarding feasibility. He asked NGPC if they would consider allowing the proposed project to assume presence and consider what mitigation would be required if we assume they are there, instead of surveying for them. Response (NGPC): Would be willing to consider options.

Spawning season restrictions would be required in addition to future mitigation decisions. NGPC will provide ENSR with spawning periods. For streams with the presence of these fish species, HDD stream crossing methods are preferred, followed by fume methods, and then dam and pump methods.

Topeka Shiner: <u>No Surveys Required</u> KXL is out of the Topeka shiner range in NE.

Massasauga: Surveys Required

Modify habitat description on the Special Status Species Screening Table to include wet seeps with reed canary grass and prairie cordgrass; draws, and sidehill seeps.

Hibernacula surveys should include:

- 1. Habitat evaluation (wetland/waterbody surveys will tell us more) wetlands with crayfish burrows present; and
- 2. Presence/absence drift fence surveys

American Burying Beetle: Surveys Required

Dr. Wyatt Hoback has been contacted for NE and SD ABB work. His procedure will include:

- 1. Conducting a habitat assessment;
- 2. Trapping in marginal or unknown areas to eliminate future survey needs in those areas; and
- 3. Trapping in known areas prior to construction to trap and relocate individuals from construction impacts.

Question (RS): Why does the "Survey Justification" column limit surveys to road crossings. The concern is also located in some isolated areas (e.g. sandhills) as well. Comment (PL): That was the approved protocol for REX but can be modified to include those areas for this project. We will involve the USFWS, NGPC, and Dr. Hoback on protocol development.

Question (JC): Is Wyatt going to handle Oklahoma as well? Answer (SP): It is unknown what work is being done with Phase I right now.

Small White Lady's Slipper and Western Prairie Fringed Orchid: Surveys Required

Wetland/waterbody surveys will give a better idea of suitable habitat. It is recommended that multiple year surveys be conducted due to the nature of these plants. It is possible that they may not flower each year, making it difficult to identify.

MBTA:

No conclusive results as of yet – avoid and minimize impacts during the nesting season.

Discussion/Action Items

- NGPC will send ENSR shapefiles they have developed with the special status species' ranges.
- NGPC would be concerned with any crossing of their property. Happy to hear reroute will take KXL off of Holt Creek WMA.
- Facilities located in isolated areas will have lighting restrictions.
- Concern for impacts to the Pallid sturgeon due to water depletions down stream but not at any of the river crossings along the route.
- No concerns for winter construction other than species with hibernacula concerns.
- USFWS/NGPC will work with ENSR to develop species specific survey protocols.

Meeting Notes USFWS/MFWP Meeting May 8, 2008 9:00 – 11:30 Helena, MT

U.S. Fish and Wildlife Service (USFWS) – Billings, MT Field Office Montana Fish, Wildlife, and Parks (MFWP)

Attendees:

Hugh Zachheim (MFWP) Paul Sihler (MFWP) Lou Hanebury (USFWS) Windy Davis (MFWP) T.O. Smith (MFWP) Chad Barnes (ENSR) Patti Lorenz (ENSR)

Purpose:

To gather information about special status species that may be impacted by the TransCanada proposed oil pipeline project and review proposed species specific surveys.

Project Updates

Note: None of the attendees from the MFWP were present at the introductory meeting and were given an overview of the project before discussing the specifics of special status species.

In addition to the general overview of the proposed KXL project through Montana, the following updates were given:

- The project route is not firm and will change;
- Aerial raptor surveys were conducted in April and included 100% cover of the proposed right-of-way (ROW) to date;
- Ground surveys for wetland/waterbodies and sensitive habitats (e.g. prairie dog towns) will begin at the end of May.

Survey tables/schedules/protocols were developed through public information without agency consultation. Sources included USFWS and NGPC websites and the NGPC Wildlife Conservation Strategy.

MFWP/USFWS Concerns

• MFWP is concerned about impacts to MFWP land and easements including lands with federal and NGO easements (e.g. Nature Conservancy). In addition, the MFWP is also concerned about the impacts to partnership incentive programs with landowners.

- FWS would like ENSR to contact the FWS refuge offices for locations of any FWS properties including refuges, satellite refuges, waterfowl production areas, etc. Specifically, get information on CMR and Medicine Lake properties.
- River crossing procedures, including intermittent prairie streams. The prairie streams include sensitive native prairie fish species.
- Because the project is scheduled for 2011 construction, the USFWS recommends that we treat species of concern as listed species. The mountain plover and the greater sage grouse are examples of species where the status of these species could change prior to construction. Impacts to these species should be avoided in order to avoid having to reconsult with the FWS at a later time.
- Focus on minimizing impacts to native grasslands. The MFWP was pleased to learn that the proposed pipeline will be buried under ground and reclaimed using native seed mixes.
- The FWS Western Raptor Guidelines for raptor buffer zones are still in draft form. ENSR can use buffer zones from past projects until the new guidelines are released.
- Impacts of concern for the MFWP include
 - o Short-term impacts;
 - o Long-term (permanent) impacts;
 - o Oil spills;
 - o Pump Stations;
 - Pipe construction; and
 - o Environmental
- Lydia Bailey with the heritage database should be contacted to assist with impact analysis. ENSR will need to sign a confidentiality agreement before receiving any information. Lydia will be able to provide T&E information as well as landownership information.
- ENSR should also contact Region 6 of the MFWP for input on landownership.
- MFWP recommended scheduling an additional meeting with MFWP specialists to hear their recommendations and receive more specific site/survey information.
- MFWP is concerned about impacts to native grassland birds. Cobern Currier would be the contact for more specific information regarding these species. The FWS commented that the take of migratory birds needs to be avoided under the conditions of the MBTA.
- MFWP would like to know more about the legal framework for pipelines, specifically eminent domain.
- Big game ranges will also be important to identify. There is antelope winter range in the northern portion of the proposed project.
- The MFWP mentioned the Milk River Cooperative agreement. More information will be needed regarding specific mitigation.

Species Specific Information

Townsend's Big-eared Bat and Spotted Bat:

Survey requirements will require a consultation with Kristi Dubois, the bat specialist with MFWP. The primary habitat will be cottonwood trees for roost sites.

Black-footed Ferret:

Survey requirements will depend on prairie dog town delineations. If the prairie dog towns meet the requirements of the 1989 USFWS Black-footed Ferret survey protocol, then black-footed ferret surveys may be required. If large prairie dog towns are found, further consultation with the FWS will be required. Black-footed Ferrets are not extirpated or block-cleared in the state of Montana.

MFWP can provide a prairie dog town GIS layer of known towns along the route. ENSR should also reference the MT prairie dog management plan. Allison Puchniak is the specialist to contact.

Swift Fox:

Surveys for den sites are recommended. The need for den surveys will depend on the 2008 pedestrian survey results. The FWS noted that swift fox are present north of the Missouri River and the presence of dens or the need for surveys south of the Missouri River is unlikely. Ryan Rauscher (MFWP) in Glasgow is the swift fox expert and the contact for more information.

Bald Eagle:

Bald eagle surveys are included in the aerial raptor surveys. Contact Kristi Dubois to access the MFWP bald eagle database and follow the Montana Bald Eagle Management Plan. In Montana, there is more concern on impacts to golden eagles than bald eagles.

Peregrine Falcon:

Peregrine falcon surveys are included in the aerial raptor surveys. Contact Kristi Dubois for the state database and known nest locations.

Whooping Crane:

The locations and habitat quality of stop-over locations will be better known after the wetland/waterbody surveys have been conducted. The USFWS provided ENSR with the guidelines of the Whooping Crane Sighting Project. Using this information and the results of the 2008 pedestrian surveys, areas of suitable habitat along the proposed route should be identified. Sightings of whooping cranes have occurred in 11 counties in eastern Montana, including areas near the proposed project route. Contact Tom Stein (FWS Whooping Crane coordinator) for further consultation. Contact Martha Tacha (USFWS -NE) for the migration period dates.

Suggested protocol: If a whooping crane is identified, construction activities will be delayed until the individual(s) have left. In addition, if a crane is identified, the USFWS will immediately be notified and a 1 mile buffer from any disturbance will be applied.

For facilities requiring transmission and/or distribution lines, requirements will include either marking those lines or burying the lines within whooping crane migration routes within suitable habitat where sightings have occurred.
Piping Plover:

Surveys will be recommended on alkali wetlands in Valley County only. The Missouri River and Frenchmen's Creek will not require surveys. The proposed route will stay out. (of all critical habitat for this species.

Interior Least Tern:

Surveys are recommended on the Yellowstone River only. The Missouri and Milk Rivers can be eliminated from future analysis.

Long-billed Curlew:

The MFWP is concerned with impacts to the long-billed curlew. There has been a heavy reduction to this species' range. Recommend surveying heavily grazed habitat.

Mountain Plover:

Surveys will be recommended within prairie dog towns (within all MT counties) and the bentonite fields in Valley County along the proposed route. Impacts for the mountain plover should be analyzed as a federally listed species due to the timescale of the project and the chance of a change in listing status. Refer to the BLM ACEC regarding mountain plovers.

Greater Sage Grouse:

Surveys required. Surveys will be required within all suitable habitat, not just BLM lands. Aerial surveys are recommended. Refer to the sage grouse protocol for Montana. Windy can provide more information for this species. Change breeding (lekking) period dates to mid-March to end of April.

MFWP provided ENSR with a map of known lek sites. These sites need to be avoided. Lek sites cannot be reclaimed. Sage grouse will not return to the site once it has been disturbed. The buffer distance is still being decided but there will be no surface occupancy within at least one mile but could be up to a four mile buffer.

There is a population of sage grouse that have known lek sited in Fallon County just over the eastern boarder of Montana that are considered to be sage grouse from the Dakotas. This population will be genetically sensitive and may required further consultations.

Sharp-tailed grouse: (Need to add to table)

MFWP requested that sharp-tailed grouse be added to the Special Status Species Screening Table in Dawson, Fallon, and Prairie Counties. This is a game bird in Montana.

Burrowing Owl:

Surveys recommended in prairie dog towns. This species is protected under the MBTA.

Blue Sucker and Pallid Sturgeon:

Surveys required for the Missouri and Yellowstone Rivers only. The Milk River can be eliminated for this species. Windy Davis, Bob B., and Montana State University are good sources for fish databases for the MFWP. Should these rivers be crossed using HDD methods, impacts to these species will be eliminated and surveys will not be required for these fish species.

Yellowstone River:

Need to reduce and minimize impacts to the Yellowstone River. Yellowstone River Conservation needs to be considered an impact issue. HDD would be the preferred crossing method.

Spiny Softshell:

Survey requirements TBD and additional consultation may be required. The MFWP/Natural Heritage Program is currently conducting surveys for this species. Bruce Maxell with the Natural Heritage Program is the contact for this species.

MBTA:

Avoid and minimize impacts during the nesting season. The Keystone Protocol is recommended.

Discussion/Action Items

- Get all contact information for specialists listed above from the MFWP and USFWS.
- Sign a confidentiality agreement with Lydia Bailey and the Natural Heritage Program in order to obtain shapefiles and data on T&E and Landownership. T.O. Smith will provide us with that contact information.
- MFWP can provide prairie dog town locations to ENSR.
- MFWP can provide known peregrine falcon nest locations.
- ENSR will send T.O. Smith an electronic version of the Special Status Screening Table to distribute to species specialists at MFWP.
- MFWP asked ENSR to set a deadline for the MFWP specialists to get species specific information back to ENSR. ENSR mentioned that it would be helpful to get that information prior to pedestrian ground surveys beginning at the end of May.
- Schedule a meeting with MFWP species specials to go over survey locations.

Meeting Notes USFWS/SDGFP Meeting June 10, 2008 10:00 – 11:45 Pierre, SD

U.S. Fish and Wildlife Service (USFWS) – Pierre, SD Field Office South Dakota Game Fish and Parks (SDGFP)

Attendees:

Charlene Besskin (USFWS) John Kirk (SDGFP) Doug Backlund (SDGFP) Silka L. F. Kempema (SDGFP) Patti Lorenz (ENSR)

Purpose:

To gather information about special status species that may be impacted by the TransCanada proposed oil pipeline project and review proposed species specific surveys.

Project Updates

The proposed project route has changed between the April and May centerlines. The May centerline will incorporate a reroute that eliminates Mellette and Jackson County and adds Lyman County. In addition, the Keya Paha River will no longer be crossed in South Dakota. It will be crossed in Keya Paha County, Nebraska.

Aerial raptor surveys were conducted in April and included 100% cover of the proposed right-of-way (ROW) at that time. Additional aerial raptor surveys are expected prior to construction.

Ground surveys for wetland/waterbodies and sensitive habitats (e.g. prairie dog towns) began at the end of May in Nebraska and Montana but have not started in South Dakota.

Survey tables/schedules/protocols were developed through public information without agency consultation. Sources included USFWS and SDGFP websites and the SDGFP Wildlife Conservation Strategy.

At this time, the lead Federal agency has not been decided and the project has yet to be publically announced.

Questions and Comments from Discussion

What are the plans for river crossings? Which rivers will be crossed using HDD measures?

There has not been a definite decision regarding river crossing methods at this time. It is likely that the Cheyenne and White Rivers will be crossed using HDD methods.

Harding County is currently undergoing a lot of oil exploration. Will the project route be in close proximity to any of those areas?

Will check – no information about this subject at this time.

How many easements will be included on a property? Just one easement for the construction ROW, or two easements: one for the construction ROW and one for the permanent ROW?

Will check – no information about this subject at this time.

ENSR should contact the South Dakota Heritage Program for information on wildlife county occurrence data. Doug can provide the information within a certain buffer distance.

ENSR would like to request wildlife information within 5 miles of the proposed centerline and rare plant information within 3 miles.

The South Dakota Heritage Program will not be able to provide information regarding state and federal land easements.

The USFWS will look into easement locations including wetland and grassland easements. There will not be very many USFWS easements in the western portion of the state.

Species Specific Information

Black-footed Ferret:

The USFWS can provide a block clearance list for prairie dog towns in South Dakota. Prairie dog town delineations will be based off of the USFWS1989 Black-Footed Ferret Survey Guidelines. The USFWS does not foresee the need for black-footed ferret surveys along the proposed route in South Dakota. They are interested in seeing the survey results for the locations of prairie dog towns.

The SDGFP provided the *South Dakota Black-tailed Prairie Dog Colony Acreage and Distribution* report from 2006. They also mentioned that plague has been detected. The Farm Service Agency can provide aerial photos to account for year-to-year changes in prairie dog towns.

Swift Fox:

Denning surveys are recommended if construction occurs during the denning period. Reintroduction sites have occurred in the badlands, Lower Brule Reservation, and Turner Ranch. SDGFP notes that an area triangulated between these locations should be surveyed for swift fox den sites. A survey protocol can be found on the Swift Fox Conservation Team Website headed by the Colorado Division of Wildlife.

River Otter:

Denning surveys are recommended for river otters along the Cheyenne, White, and Bad Rivers. The rivers should have perennial flows and/or be spring fed. Beaver presence is also strongly associated with river otter occurrence.

Bald Eagle:

Bald eagle surveys are included in the aerial raptor surveys. Surveys for nesting and roosting sites are recommended along the entire route in South Dakota. They have been identified nesting in agricultural lands as well as major waterbodies. The USFWS provided a map of known nesting locations.

Peregrine Falcon:

Peregrine falcon surveys are included in the aerial raptor surveys. There are no known breeding pairs of peregrine falcons in South Dakota, migrants only.

Whooping Crane:

The locations and habitat quality of stop-over locations will be better known after the wetland/waterbody surveys have been conducted. The USFWS provided a map of the migration corridor through South Dakota.

Suggested protocol: If a whooping crane is identified, construction activities will be delayed until the individual(s) have left. In addition, if a crane is identified, the USFWS will immediately be notified and await further mitigation.

For facilities requiring transmission lines, requirements will include either marking those lines or burying the lines within whooping crane migration routes. The locations of these facilities have not been identified at this time.

Piping Plover:

Breeding piping plovers have not been identified within the proposed project area. No surveys are required.

Interior Least Tern:

Surveys will be required on the Cheyenne River only. The SDGFP plans to conduct breeding surveys this year.

Blacknose Shiner, Northern Redbelly Dace, Pearl Dace:

Surveys are recommended within tributaries of the Keya Paha River including Cottonwood Creek. Spawning period restrictions are also recommended. More data regarding stream crossings will be available with the completion of the 2008 ground surveys.

Sturgeon Chub:

Surveys are recommended within the Cheyenne and White River crossings. HDD methods would eliminate impacts to this species.

American Burying Beetle:

American burying beetles are present in Tripp County. The USFWS and SDGFP do not recommend trapping or relocating beetles. They recommend that we assume presence and consider off-site mitigation. The agencies are interested in purchasing land suitable for beetles in lieu of survey costs. This process will include the issue of a take permit.

Questions/Comments

There are no established buffer zone guidelines for raptors for South Dakota. Most widely accepted has been a 0.5 mile buffer zone for eagles or within line of sight.

The USFWS wondered what affect warm pipelines have on habitats (e.g. do they not allow some wetlands to freeze in the winter) and migrations.

Will check - no information about this subject at this time.

The USFWS would like to add the Western Prairie Fringed Orchid to the Special Status Species list. Surveys are recommended in wet meadows in Tripp County along the route south of Hwy 18.

SDGFP is interested in pump station locations. They would benefit from the purchase of lands being used for the sites by possibly gaining tracks of land to expand current state properties.

SDGFP is concerned with game birds including sage grouse, sharp-tailed grouse, and greater prairie chickens. It is recommended that ENSR contact the SDGFP game specialist Tom Kirschenmann on specifics concerning lek sites and game ranges.

TransCanada – Keystone Pipeline Meeting Summary E-Mail Posting Form

Meeting Location: MFWP Office, Glasgow, MT

Date & Time: July 29, 2008 / 9:00 – 11:00 a.m.

Keystone Team Members: Patti Lorenz

Agency Contact Information:

Name	Organization	Title	Phone / E-mail address
Kelvin Johnson	MFWP	Wildlife Biologist	406-228-3700 / kelvinj@mt.gov
Ryan Rauscher	MFWP	Native Spp. Biologist	406-228-3700 / rrauscher@mt.gov
Howard Burt	MFWP	Wildlife Biologist	406-377-4556 / hrburt@mt.gov
Harold Wentland	MFWP	R6 Wildlife Manager	406-228-3710 / hwentland@mt.gov
John Carlson	BLM	BLM Wildlife Biologist	406-228-3762 / john_carlson@blm.gov
Mike Ruggles	MFWP	Fisheries Coordinator	406-526-3287 / mikeruggles@mt.gov
Pat Gunderson	MFWP	Wildlife Biologist	406-228-3704 / pgunderson@mt.gov
T.O. Smith	MFWP	Fish and Wildlife Plan Coordinator	406-444-3889 / tosmith@mt.gov

Meeting Purpose:

ENSR met with the MFWP and BLM to discuss issues pertaining to wildlife and special status species that have been identified for the Project. The goals of this meeting were to: 1) obtain concurrence on the proposed survey protocols and survey locations; and 2) discuss other issues or concerns that MFWP and BLM have regarding the Project.

Action Items:

Issue Description/Responsible Parties/Concern Level

MFWP asked if we were considering impacts to game species as well as special status species. Answer- yes and we have information from the MT Natural Heritage Program regarding big game ranges. Also concerned about impacts to grouse with the construction of power lines. This creates raptor perches. MFWP is concerned about silver sage habitat crossed north of Hwy 2 – sensitive sage grouse area. MFWP is also concerned about the route crossing the Porcupine Grasslands, a remnant native grassland area.

Concern Level :	Concern Level :		
	ligh	Moderate	Low

Issue Description/Responsible Parties/Concern Level

MFWP stated that if the Missouri, Yellowstone, and Milk Rivers are crossed using HDD methods, there will be no impacts to fishes found in those rivers. Would also like to recommend including the Milk River on the list of HDD rivers due to the location of the crossing near the spillway. There are additional fishery concerns with the crossing of the Redwater River.

Issue Description/Responsible Parties/Concern Level

MFWP concerned about the pearl dace within prairie streams crossed by the project. Recommend researching the prairie streams database / research available on the MFWP website. MFWP can assist with any additional information on the streams crossed by the project. MFWP would like more information on water use for hydrostatic testing.

Concern Level : High Moderate

Issue Description/Responsible Parties/Concern Level

MFWP would like more information on TransCanada's Standard Mitigation Measures and the locations of permanent structures (e.g. pump stations, access roads, and transmission lines)

Concern Level :

High Moderate Low

Low

2

Issue Description/Responsible Parties/Concern Level

Construction specifics were discussed including the width of the disturbance areas and what will be permanently impacted. A 50 ft. permanent easement will be maintained for the life of the pipeline. This involves managing vegetation to a certain height (e.g. trees will not be allowed to grow within that 50 feet). This fact brings up the concern for the removal of cottonwoods along the route. There is a conservation group that would be concerned with this impact.

Concern Level :			
н	igh Moderate	Low	

Issue Description/Responsible Parties/Concern Level

Impacts to grassland birds are a concern. BLM recommends surveying for these grassland birds in July. This part of the state contains a large diversity of grassland birds and is considered a globally important area. Bitter Creek WSA in northern Valley County will be crossed by the route and may be designated as a BLM ACEC. It is also considered an important bird area by the National Audubon List. To avoid impacts to these birds and comply with the MBTA, it is recommended that construction occur outside of the breeding season, more specifically, in the fall and winter. Surveys and clearing activities prior to construction are not affective mitigation measures.

High Moderate Low

Issue Description/Responsible Parties/Concern Level

MFWP recommends burying transmission lines associated with the project.	
Concern Leve	el : High Moderate Low

Issue Description/Responsible Parties/Concern Level

MFWP emphasized the need to comply with the Major Facilities Siting Act. Thomas Ring with the DEQ would be the contact.

Concern Level : High Moderate Low

Issue Description/Responsible Parties/Concern Level

MFWP would like to know what TransCanada is willing to do as far as mitigation is concerned. They view mitigating for impacts to an entire community rather than individual T & E species. These communities include species of concern. They emphasized mitigating for what is directly impacted by the project. For example, if impacts included the loss of sagebrush habitat, MFWP would like compensation for that habitat and is not in agreement with mitigating for another habitat not impacted by the project. MFWP understands that not all impacts can be avoided.

	Concern Level :	
	righ Mod	erate Lov
Issue Description/Responsible Parties/Concern Level		
As far as surveys go, MFWP has an interest in knowing who will be interested in doing them if they could receive payment for their wo to complete that type of work.	be conducting the surveys and ma brk. They would need to hire addit	y be ional staf

Follow-up Required / Requested

MFWP Needs:

- Landuse / habitat impacts amount crossed;
- Reports on any surveys completed;
- TransCanada's Standard mitigation measures;
- Locations of power lines, access roads, and permanent structures (e.g. pump stations and valve sights). They would like to add input to these locations; and
- If and when surveys are conducted information on specialists conducting those surveys.

ENSR needs:

- As much location information as can be provided willing to sign confidentiality agreements;
- Would like MFWP and BLM to review the SSS Table list and add input (response from MFWP is that it will take some time to do that); and

• Sensitive time windows (i.e., spawning dates, survey periods, winter range exclusion dates, etc.).

٩.

Additional Comments

MFWP would like to review the meeting notes and add concurrence.

TransCanada – Keystone XL Phase II Pipeline Meeting Summary E-Mail Posting Form

Meeting Location: SDGFP, Pierre, SD

Date & Time: January 27, 2009 / 9:00 a.m. - 10:45 a.m.

Keystone Team Members: Patti Lorenz

Agency Contact Information:

Name	Organization	Title	Phone / E-mail address
Charlene Besskin	U.S. Fish and Wildlife Service	Fish and Wildlife Biologist / TWS Certified Wildlife Biologist	(605) 224-8693 Ext. 231 Charlene_Bessken@fws.gov
Doug Backlund	South Dakota	Wildlife Biologist	(605) 773-4345
	Department of Game, Fish and Parks S.D. Natural Heritage Program		Doug.Backlund@state.sd.us
Leslie Peterson	South Dakota	Aquatic Resource	(605) 773-6208
	Department of Game, Fish and Parks	Coordinator	Leslie.Petersen@state.sd.us
John Lott	South Dakota Department of Game, Fish and Parks	Chief Aquatic Resources	(605) 773-4508 John.lott@state.sd.us

Meeting Purpose:

AECOM met with the SD USFWS and SDGFP to discuss survey requirements, surveys protocols, mitigation measures, and best management practices for wildlife and special status species that have been identified for the Project. The goals of this meeting were to obtain agency concurrence on the proposed survey protocols, survey locations, and other mitigation measures.

Meeting Notes

Species Discussion:

Black-footed Ferret:

SD block cleared. No further surveys or mitigation requirements. Prairie dog towns were identified during the 2008 biological field surveys. SDGFP notes good information for associated burrowing owls. They are not a listed species but will fall under the MBTA.

American Burying Beetle:

No further survey work will be accepted. Off-site mitigation banking will be required for impacts to suitable ABB habitat at a 1:2 reclamation ratio. Both USFWS and SDGFP will required off-site mitigation to enhance ABB habitat in southern Tripp County.

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 Janurary 1 27 SDGFP_USFWS\2009 USFW_SDGFP_012909_meeting minutes flash24hr.doc Recommendations include purchasing land for SDGFP management (e.g. waterfowl protection areas, areas for hunting), setting up conservation easements with the Nature Conservancy, or USFWS easements (e.g. grassland easement). Suggested properties include Dogear Lake, Rahn Lake, and Turtle Butte. Concerns regarding light pollution also exist for areas of the sandhills that remain undeveloped. ABB are impacted to light by being attracted to it instead of meeting their daily needs for survival. SDGFP provided some BMP's including installing shading on light fixtures that focus the light towards the ground and types of bulbs that are not as bright.

Whooping Crane:

Keystone will not be permitting the transmission lines but will add recommendations to bury and or mark appropriately overhead lines. Regarding centerline construction, the USFWS recommends surveying for cranes if construction will cross wetland/waterbody habitat that provides suitable stopover habitat during the migration period. USFWS would accept clearance from an Environmental Inspector (EI). It would be beneficial to provide a habitat assessment to quantify suitable stopover habitat.

Interior Least Tern.

Data was presented from the 2008 surveys at the Cheyenne River. No further surveys are needed if construction occurs outside the nesting period at the Cheyenne River. HDD methods will eliminate impacts to nesting habitat. The SDGFP will be conducting annual surveys at the Cheyenne and will provide AECOM with the results. If construction occurs during the nesting period, additional nesting surveys would be required.

Western Prairie Fringed Orchid:

Surveys are scheduled for 2009. USFWS recommends additional surveys in 2010 as well because the flowers do not always bloom each year. In addition, these plants are root based so an approach to protect seeds (e.g. topsoil segregation) is not applicable. The surveyor also needs to be capable of locating the plant without the flowers present and at young stages. There has not been a record in South Dakota in 100 years but this part of the state has never been surveyed. Don Hazlette was mentioned as a qualified surveyor.

Swift Fox:

Data was presented regarding potential swift fox dens located during the 2008 biological field surveys. Activity status was not determined at that time. SDGFP recommends verifying the use by canids and conducting more intensive surveys prior to construction. If an El notices a potential den site prior to construction, it is recommended that the activity be verified prior to disturbing the den. SDGFP is only concerned about impacts directly disturbed by construction and during the denning period. It was also noted that no den sites were identified in the initial area described at the first meeting in 2008.

River Otter:

Surveys are planned prior to construction at the Cheyenne, White, and Bad rivers. SDGFP recommends surveys only if suitable habitat (e.g. beaver lodges) is found at the crossing.

Sensitive Fish:

Concern for these species within crossings of tributaries of the Keya Paha River. AECOM presented data from the 2008 biological surveys. Only two intermittent crossings were identified. SDGFP will look at the crossings with more detail to determine the need for presence/absence surveys. SDGFP would like more data because these streams have never been surveyed. Buffalo Creek was delineated but Lute Creek was not and it was recommended that a delineation be completed. SDGFP will provide more information on spawning periods.

Bald Eagle:

AECOM presented the results of the 2008 aerial raptor surveys. Additionally, winter roost surveys are scheduled for February 2009 and nesting surveys are planned for April 2009. SDGFP does not believe any communal roost sites exist along the route. SDGFP will provide the agreement between USFWS/SDGFP/ACOE on bald eagle guidelines.

Raptors:

Ferruginous hawk nests mostly in trees in SD. Ground crews did not identify and ground nests. AECOM asked if it would be possible to remove nest trees outside the nesting period. SD law prohibits these activities without a permit. SDGFP will provide more information on the permit.

Prairie Grouse:

SDGFP recommends aerial lek surveys along the ROW within line of sight (~0.25 miles). SDGFP will provide locations and surveys frequency.

Follow-up Required / Requested

SDGFP Needs:

More information on sage grouse habitat and survey protocol – AECOM will follow up with Chad Switzer.

AECOM needs:

- Information of South Dakota law regarding removing nest trees;
- MOU with ACOE, USFWS, and SDGFP regarding bald eagle management;
- ABB off-site mitigation options;
- Aerial grouse lek survey locations;
- Annual survey results for least tern at the Cheyenne River;
- Survey period for sensitive fish species.

Additional Comments

- Sprague's Pipit is up for federal listing. The USFWS will send the 90 day finding. This species may warrant native prairie surveys.
- MBTA discussions are ongoing and KXL will most likely follow suite with the developing Keystone Conservation Agreement. This will involve mitigating for the loss of trees and grassland habitat.
- Verify that the pipeline will not heat wetlands/waterbodies crossed, keeping them open and attracting waterfowl to stay in an area when they should be migrating through.
- AECOM will finalize a document with the results of this meeting to be sent out for final concurrence to TransCanada and USFWS/SDGFP.
- Dave Ottie is a good contact for reclamation seed mix recommendations.

TransCanada – Keystone XL Phase II Pipeline Meeting Summary E-Mail Posting Form

Meeting Location: Cottonwood Inn, Glasgow, MT Date & Time: February 3, 2009 / 8:30 – 11:30 a.m.

Keystone Team Members: Patti Lorenz, Paul Swartzinski

Agency Contact Information:

Name	Organization	Title	Phone / E-mail address
Harold Wentland	MFWP	R6 Wildlife Manager	406-228-3710 / hwentland@mt.gov
Arnold Dood	MFWP	Endangered Species Biologist	406-994-6433 / adood@mt.gov
Ryan Rauscher	MFWP	Native Spp. Biologist	406-228-3700 / rrauscher@mt.gov
Steve Dalbey	MFWP	Fisheries Manager	406-228-3706 / sdalbey@mt.gov
Woody Baxter	MFWP	Regional Parks Manager	406-228-3707 / gwbaxter@mt.gov
Pat Gunderson	MFWP	Wildlife Biologist	406-228-3704 / pgunderson@mt.gov
Windy Davis	MFWP	Energy Specialist	406-228-0942 / mikeruggles@mt.gov
John Carlson	BLM	BLM Wildlife Biologist	406-228-3762 / john_carlson@blm.gov

Meeting Purpose:

ENSR met with the MFWP and BLM to discuss survey requirements, surveys protocols, mitigation measures, and best management practices for wildlife and special status species that have been identified for the Project. The goals of this meeting were to obtain MFWP concurrence on the proposed survey protocols, survey locations, and other mitigation measures.

Meeting Notes

Project Updates provided by AECOM:

- Construction scheduled for 2011;
- Lead federal agency is the Department of State;
- The MFSA has been submitted with the DEQ;
- The EIS and BA are scheduled for 2009;
- Biological field surveys were conducted along the entire route where landowner access was granted in 2008.

Project Updates provided by MFWP:

• The Cornwell Conservation Easement has been denied by the Governor. This might be a good off-site mitigation

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 February 3 1 MFWP_BLM\MFWP_BLM_020309_meeting minutes_flash24hr.doc

opportunity for TransCanada.

Project Updates provided by BLM:

- The landownership on the Milk River has been changing hands;
- Lands along the Missouri River Crossing are in the early stages of becoming a State Park.

AECOM Discussed BMP's/Mitigation Measures/Survey Protocols on a species by species approach. Below are the notes of those discussions by species:

Federal Species

Black-footed Ferret:

AECOM: Presented locations of the two prairie dog towns identified during 2008 field surveys.

MFWP/BLM: Recommend conducting a full delineation of the towns. Both towns are located on BLM lands. Both BLM and MFWP have data on the town located in Valley County but no one has ever surveyed McCone County for prairie dog towns. If the towns meet the USFWS BFF requirements, additional BFF surveys will be recommended. MFWP would like the lat/long locations for both towns. BLM will get AECOM more information on the town in Valley County.

Whooping Crane:

AECOM: At this time, Keystone will not be permitting the electrical powerlines. Electrical powerline providers would be responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments. MFWP: The Yellowstone River has been used as a stop-over site during migration in the past. BLM: The Project is on the extreme Western edge of the migration route.

Piping Plover:

AECOM: Surveys for presence of nesting plovers will be conducted within alkali wetlands in Valley County (MP 50.0 and 57.0) in 2009 and prior to construction in 2011 if construction will occur there during the nesting period. MFWP: Concerned about the buffer size of a 0.25 mile if a nest is found but will accept it because it is a BLM standard.

Least Tern:

AECOM: Surveys for terns on the Yellowstone River will be conducted in 2009 and prior to construction in 2011 if construction will occur there during the nesting period.

MFWP: Concerned about the buffer size of a 0.25 mile if a nest is found but will accept it because it is a BLM standard. MFWP would like the lat/long location of the Yellowstone River crossing. Surveys for terns at the Yellowstone are conducted on an annual basis by MFWP and they would invite biologists for the Project to attend those surveys with MFWP. The optimal time of survey would be the last part of June or early July but it might vary due to water levels.

Pallid Sturgeon:

AECOM: HDD methods will be used to cross the Milk, Missouri, and Yellowstone Rivers reducing impacts to this species. MFWP/BLM: Agreed

Grey Wolf:

MFWP: May want to address potential to occur within the Project area but not further surveys or mitigation would be required. AECOM: The USFWS has not addressed this species as potentially occurring within the Project area.

BLM Sensitive/ Montana Species of Concern

Swift Fox:

AECOM: 32 potential den sites were identified during the 2008 field surveys. The activity status of the den sites was not determined at that time.

MFWP: What does "potential den site" mean?

AECOM: Essentially a hole used by a mammal.

MFWP: Recommended conducting more intensive surveys for swift fox dens in Phillips and Valley Counties only. It would be odd for swift fox records south of the Missouri River.

AECOM: The USFWS recommended the same locations.

Townsend's Big-eared Bat:

AECOM: No further surveys or mitigation measures are proposed because the Project does not cross suitable maternity roost or hibernacula habitat (e.g., caves or mines).

BLM: Townsend's have been observed using badlands areas for maternity roosts near the project south of the Missouri River in

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 February 3 2 MFWP_BLM\MFWP_BLM_020309_meeting minutes_flash24hr.doc McCone County. Recommend conducting acoustic surveys for the presence of bat species within that habitat.

Spotted Bat:

AECOM: AECOM: No further surveys or mitigation measures are proposed because the Project does not cross suitable maternity roost or hibernacula habitat (e.g., caves or mines).

MFWP: This species has been documented along the Milk River.

BLM: Acoustical surveys are recommended to identify all bat species identified as occurring within the Project area.

Long-legged Myotis:

AECOM: This species uses forested areas for maternity roosts. The 2008 field surveys provided locations of all forested areas along the route and the information was presented to MFWP and BLM.

BLM: Acoustical surveys are recommended to identify all bat species identified as occurring within the Project area.

Black-tailed Prairie Dog:

AECOM: No further surveys or mitigation measures are proposed specifically for this species.

MFWP: Are you treating them as listed species due to their current proposal for federal listing?

AECOM: We would like recommendations from MFWP on how to cross the towns. Right now there is no mitigation proposed but due to the linear nature of the disturbance and the mobility of the species, impacts would likely be low. Additionally, there have been observations of prairie dogs being attracted to the ROW after the pipe has been covered. MFWP: Requested coordinates of the locations of the town.

Meadow Jumping Mouse and Preble's Shrew:

AECOM: No further surveys or mitigation measures are proposed. MFWP/BLM: Agreed.

Bald Eagle:

AECOM: Aerial surveys were conducted in April 2008. No nesting eagles were identified along the route in Montana. One roost site was identified at Frenchmen Reservoir, approximately 1 mile southwest of the Project. Additional winter roost surveys are planned for Feb. 2009 and additional nest surveys are planned for April 2009. Additional surveys for winter roosts and nests will be conducted prior to construction.

BLM: There is a communal roost site located upstream from the Project crossing on School Trust Lands near the fishing access. There have also been nesting attempts in this location.

MFWP: Nesting attempts have not been successful.

Peregrine Falcon:

AECOM: The falcon is a non-nesting migrant through the project area but would be included in additional raptor surveys. No peregrine falcon nests were identified during the April surveys. MFWP/BLM: Agreed.

Greater Sage Grouse:

AECOM: We have gathered data on historic known leks and suitable sagebrush habitat. We would propose to do aerial lek surveys within that habitat.

BLM: Sage grouse have been observed using habitat at great distances from sagebrush. The BLM has a good handle on the locations of lek sites along the Project route

MFWP: MFWP does as well and can block out portions of Valley County. Also, MFWP recommends doing pedestrian surveys but also agrees that helicopter surveys will be acceptable. MFWP has also conducted lek surveys using a fixed-wing aircraft.

BLM/MFWP: They have little survey information on McCone County and would like additional surveys in that area.

MFWP: Would like to recommend compensation to do the surveys themselves. They would be willing to be accompanied by a AECOM representative.

AECOM: According to Adam Messer with MFWP, we do not cross any wintering habitat and the grouse in this part of the country are considered non-migratory.

MFWP: Disagreed. They will provide AECOM with more specific wintering locations. They also recommend looking for these areas during the bald eagle winter roost surveys along the southern portion of the route in Fallon County. Kent Undlin with the BLM has a database of sagebrush that can be provided.

Sharp-tailed Grouse:

AECOM: Surveys for the sharp-tailed grouse will be considered incidental when conducting the greater sage grouse surveys. Asked MFWP/BLM if aerial surveys could identify sharp-tail leks.

MFWP: Yes, known data of lek sites using aerial surveys.

Migratory Bird Species of Concern:

AECOM: A Conservation Agreement for the MBTA between the USFWS Migratory Bird Office and Keystone is currently being developed and the Keystone XL Pipeline will follow suite. The Sprague's pipit, however, is up for federal listing. AECOM is planning native prairie surveys to identify suitable habitat for 2009.

BLM: The peak nesting period for migratory birds is late May and June and construction should be avoided during those times. The BLM is concerned about permanent structures removing nesting habitat.

Mountain Plover:

AECOM: The USFWS recommended surveys for the mountain plover in prairie dog towns and bentonite fields in Valley County. MFWP: MFWP has concerns for this species in short-grass prairie and Ag fields as well. MFWP will provide survey quadrants to AECOM.

Burrowing Owl:

AECOM: Surveys will be conducted in prairie dog towns crossed by the route.

MFWP: Mountain plover also utilize ground squirrel burrows and small mammal burrows and recommends surveying in these locations as well.

Swainson's Hawk and Ferruginous Hawk:

AECOM: The aerial raptor nest surveys and the biological field surveys did not identify any active swainson hawk or ferruginous hawk nests along the route in Montana. Additional, raptor nest surveys are scheduled for 2009 and prior to construction. Would preclearing measures be accepted by MFWP and BLM?

MFWP: Yes as long as any ferruginous hawk nests could be relocated prior to disturbance.

Sturgeon Chub, Sicklefin Chub, Sauger, Paddlefish, Shortnose Gar, Blue Sucker, Northern Redbelly Dace x Finescale Dace: AECOM: No impacts to these species because HDD methods will be used to cross the Missouri, Milk, and Yellowstone Rivers. Frenchmen Creek is not planned for HDD activities and may impact the Northern redbelly dace x finescale dace. Also, Boxelder Creek is not planned for HDD activities and may impact the sauger.

MFWP: Does not feel like surveys would be a good way to determine the presence of fish species. Instead, they would like to assume presence and provide construction exclusion periods during the spawning periods. This goes for other stream crossing not using HDD methods such as the Redwater River and other sensitive prairie streams.

MFWP: MFWP would like to also add Burbot to the list of sensitive fish occurring within the project area but no further surveys or mitigation would be required.

Reptiles/Amphibians:

MFWP: There are species of concern missing from analysis.

AECOM: AECOM will add more detail on reptiles and amphibians. Those currently occurring within the project area include the western hog-nosed snake, common sagebrush lizard, great plains toad, greater short-horned lizard, milk snake, northern leopard frog, plains spadefoot, snapping turtle, and spiny softshell.

MFWP: Would like to recommend setting up mitigation measures for protecting snake hibernacula and preventing snakes from entering an open trench and not being able to escape. They would like to propose using a specialist that would be able to handle hibernating snakes that might be overturned during construction activities.

Big Game:

AECOM: Big game sensitive range exclusions will be adhered to on BLM lands only.

MFWP: Why not private land as well?

AECOM: MFWP does not have state statues or laws for requiring these mitigation measures on private lands.

Action Items:

Issue Description/Responsible Parties/Concern Level

MFWP asked if TransCanada would consider forms of off-site mitigation to compensate for impacts to wildlife, including sensitive species.

Answer- Yes, recommendations in the form of off-site mitigation will be given to TransCanada for further consideration.

	Concern	Level :		
		High	Moderate	Lov
lssue De	scription/Responsible Parties/Concern Level		¢.	
BLM and	MFWP would like all survey reports sent to the Montana Natural Heritage	Program		
	Concern	Level : High	Moderate	Lov
lssue De	escription/Responsible Parties/Concern Level			
Can MFV	/P make recommendations for the design of access roads?			
Answer: I	Not sure will follow up.			
	Concern	Level :	Moderate	Lov
MEWD N	p Required / Requested			
	eas:			
	till anna Calandin atala fan Mallassatan a IDissa Os			
• La	t/Long Coordinates for Yellowstone River Crossing;			
• La • La • Lii	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; ıks to MFSA;			
 La La Li La 	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; iks to MFSA; t/Long Coordinates for stream crossings;			
 La La Li Li La In 	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; hks to MFSA; t/Long Coordinates for stream crossings; ormation on Access Road structure			
• La • La • Lii • La • In	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; hks to MFSA; t/Long Coordinates for stream crossings; ormation on Access Road structure ieeds:			
 La La La La In AECOM 1 Sa Da 	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; hks to MFSA; t/Long Coordinates for stream crossings; formation on Access Road structure needs: ngebrush locations based on the database Kent Undlin has put together (n ivis).	nentioned b	y Windy	
 La La Lin La In AECOM n Sa Da Lo an 	t/Long Coordinates for Yellowstone River Crossing; t/Long Coordinates for Prairie Dog Towns; hks to MFSA; t/Long Coordinates for stream crossings; formation on Access Road structure needs: ligebrush locations based on the database Kent Undlin has put together (n ivis). cations of sage grouse survey locations. Wendy mentioned that she wou ∋as of Valley County.	nentioned b Id be able to	y Windy o błock ou	t

Additional Comments

- AECOM will finalize a document with the results of this meeting to be sent out for final
- concurrence to TransCanada and MFWP.
- An additional meeting with the BLM is scheduled for February 5, 2009.

TransCanada – Keystone XL Phase II Pipeline Meeting Summary E-Mail Posting Form

Meeting Location: NA – Conference Call

Date & Time: February 5, 2009 / 10:00 a.m. - 12:00 p.m.

Keystone Team Members: Patti Lorenz, Paul Swartzinski

Agency Contact Information:

Name	Organization	Title	Phone / E-mail address
Kent Undlin	BLM – Miles City Field Office	Wildlife Biologist	406-233-2845 kundlin@mt.blm.gov
John Carlson	BLM – Glasgow Field Office	Wildlife Biologist	(406) 228-3762 john_carlson@blm.gov
Fritz Prellwitz	BLM – Malta Field Office	Wildlife Biologist	406-654-5118 fritz_prellwitz@blm.gov

Meeting Purpose:

AECOM arranged a conference call with the BLM to discuss survey requirements, surveys protocols, mitigation measures, and best management practices for wildlife and special status species that have been identified for the Project. The goals of this meeting were to obtain MFWP concurrence on the proposed survey protocols, survey locations, and other mitigation measures.

Meeting Notes

Project Updates provided by AECOM:

- Construction scheduled for 2011;
- Lead federal agency is the Department of State;
- The MFSA has been submitted with the DEQ;
- The EIS and BA are scheduled for 2009;
- Biological field surveys were conducted along the entire route where landowner access was granted in 2008.

AECOM Discussed BMP's/Mitigation Measures/Survey Protocols on a species by species approach. Below are the notes of those discussions by species:

Federal Species

Black-footed Ferret:

AECOM: Presented locations of the two prairie dog towns identified during 2008 field surveys.

BLM: The BLM thinks that there is data on the town located in Valley County. There are concerns for an additional town located near MP 13 in Phillips county approximately 1.5 miles NE of the proposed route. At what distance will impacts to ferrets be assessed (e.g., towns crossed by the route, adjacent to the route, etc.)?

AECOM: As discussed with USFWS, impacts will only be assessed for prairie dog towns crossed by the route. If the pipeline does not cross a prairie dog town, no impacts are anticipated to black-footed ferrets.

BLM: If the towns meet the USFWS black-footed ferret requirements, additional BFF surveys will be recommended. BLM would

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 February 1 5_BLM\BLM_020509_meeting minutes_flash24hr.doc like the lat/long locations for both towns. BLM will get AECOM more information on the town in Valley County.

Whooping Crane:

AECOM: At this time, Keystone will not be permitting the electrical powerlines. Electrical powerline providers would be responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments. BLM: Sightings of migrating whooping cranes have been to the west of the project area but the BLM does not have any concerns for this species regarding impacts from centerline construction. BLM asked if an impact analysis for the whooping crane will be included in the BA. AECOM: Yes.

Piping Plover:

AECOM: Surveys for presence of nesting plovers will be conducted within alkali wetlands in Valley County (MP 50.0 and 57.0) in 2009 and prior to construction in 2011 if construction will occur there during the nesting period. BLM: Agreed.

Least Tern:

AECOM: Surveys for terns on the Yellowstone River will be conducted in 2009 and prior to construction in 2011 if construction will occur there during the nesting period.

BLM: Agreed.

Pallid Sturgeon:

AECOM: HDD methods will be used to cross the Milk, Missouri, and Yellowstone Rivers reducing impacts to this species. BLM: Agreed

BLM Sensitive/ Montana Species of Concern

Swift Fox:

AECOM: 32 potential den sites were identified during the 2008 field surveys. The activity status of the den sites was not determined at that time. Also mentioned the results of discussions with MFWP earlier in the week regarding recommendations to conduct more intensive surveys for swift fox dens in Phillips and Valley Counties only. It would be odd for swift fox records south of the Missouri River.

BLM: Agreed that more extensive den surveys are needed for Phillips County.

Townsend's Big-eared Bat:

AECOM: Initial assessment of potential habitat for the Townsend's big-eared bat indicated no further surveys or mitigation measures because the Project did not cross suitable maternity roost or hibernacula habitat (e.g., caves or mines). However, conversations with the BLM earlier in the week discussed Townsend's observed using badlands areas for maternity roosts near the project south of the Missouri River in McCone County. Recommend conducting acoustic surveys for the presence of bat species within that habitat. BLM: Agreed.

Spotted Bat:

AECOM: Initial assessment of potential habitat for the spotted bat indicated no further surveys or mitigation measures because the Project does not cross suitable maternity roost or hibernacula habitat (e.g., caves or mines).

BLM: This species has been documented along the Milk River and acoustical surveys are recommended to identify all bat species identified as occurring within the Project area.

Long-legged Myotis:

AECOM: This species uses forested areas for maternity roosts. The 2008 field surveys provided locations of all forested areas along the route and the information was presented to MFWP and BLM.

BLM: Acoustical surveys are recommended to identify all bat species identified as occurring within the Project area.

Black-tailed Prairie Dog:

AECOM: No further surveys or mitigation measures are proposed specifically for this species. Due to the linear nature of the disturbance and the mobility of the species, impacts would likely be low. Additionally, there have been observations of prairie dogs being attracted to the ROW after the pipe has been covered.

BLM: Recommended mitigation measures for avoiding impacts to this species:

- Avoid crossing towns;
- Neck down construction corridor within the town (i.e., similar to wetland crossing procedures);
- Implement timing restrictions for construction activities between March 1 and July 1.

Bald Eagle:

AECOM: Aerial surveys were conducted in April 2008. No nesting eagles were identified along the route in Montana. One roost site was identified at Frenchmen Reservoir, approximately 1 mile southwest of the Project. Additional winter roost surveys are planned for Feb. 2009 and additional nest surveys are planned for April 2009. Additional surveys for winter roosts and nests will be conducted prior to construction.

BLM: There is a communal roost site located approximately 2 miles upstream from the Project crossing on School Trust-Lands near the fishing access. There have also been nesting attempts in this location. Historic use areas also include the area downstream from the dam at Frenchmen Reservoir (~1 mile from the Project crossing) and on the Yellowstone River west of the bridge in the town of Fallon.

AECOM: The Project crosses the Yellowstone approximately 5 miles to the east of the town of Fallon.

BLM: Recommends contacting Christy Duboise (MFWP) to access the Montana Bald Eagle database.

Peregrine Falcon:

AECOM: The falcon is a non-nesting migrant through the project area but would be included in additional raptor surveys. No peregrine falcon nests were identified during the April surveys. MFWP/BLM: Agreed.

Greater Sage Grouse:

AECOM: We have gathered data on historic known leks and suitable sagebrush habitat. We would propose to do aerial lek surveys within that habitat. A summary of what was discussed with MFWP and John Carlson (BLM) includes:

BLM: Sage grouse have been observed using habitat at great distances from sagebrush. The BLM has a good handle on the locations of lek sites along the Project route

MFWP: MFWP does as well and can block out portions of Valley County. Also, MFWP recommends doing pedestrian surveys but also agrees that helicopter surveys will be acceptable. MFWP has also conducted lek surveys using a fixed-wing aircraft.

BLM/MFWP: They have little survey information on McCone County and would like additional surveys in that area. AECOM: According to Adam Messer with MFWP, we do not cross any wintering habitat and the grouse in this part of the country are considered non-migratory.

MFWP: Disagreed. They will provide AECOM with more specific wintering locations. They also recommend looking for these areas during the bald eagle winter roost surveys along the southern portion of the route in Fallon County. Kent Undlin with the BLM has a database of sagebrush that can be provided.

BLM: Agreed that areas North of the Missouri River have been extensively surveyed for known lek sites near the project area. The BLM recommends avoiding these areas during the lekking period. They also recommend avoiding construction in nesting habitat during the nesting period. BLM asked how we determined areas of sagebrush crossed by the project.

AECOM: Sagebrush locations were determined by using a combination of field verification during the 2008 field surveys and aerial map interpretation. AECOM offered to send K. Undlin the results of the sagebrush delineations.

BLM: Agreed, would like to compare that information to the BLM sagebrush database.

AECOM: The current survey protocol will include:

- Extensive aerial lek surveys within 4 miles of the route within sagebrush habitat in McCone County;
- Aerial lek surveys within line of sight (~0.25 miles) along the rest of the route through Montana;
- Sharp-tail grouse lek surveys will occur simultaneously with the sage grouse surveys (incidental surveys);
- Ground crews will be utilized to verify any active leks observed during the aerial surveys along the route.

BLM: Agreed. Also recommend checking with Lou Hanebury on results of the USFWS sage grouse lek database for lek numbers and activity.

AECOM: The dominant type of sagebrush is silver sage. This species is known to restablish better than other types of sagebrush, agreed?

BLM: Agreed but recommend planting seedlings during reclamation activities.

AECOM: Are there any plant material centers nearby?

BLM: Yes, there is a BLM seed source center. Helping out the seed source center is also a good mitigation measure to reduce impacts to these species.

Sharp-tailed Grouse: (See sage grouse discussion above)

Migratory Bird Species of Concern:

AECOM: A Conservation Agreement for the MBTA between the USFWS Migratory Bird Office and Keystone is currently being developed and the Keystone XL Pipeline will follow suite. The Sprague's pipit, however, is up for federal listing. AECOM is planning native prairie surveys to identify suitable habitat for 2009.

BLM: Regardless of the MBTA agreements, mitigation measures for impacts to BLM sensitive bird species need to be determined specifically for BLM lands. The peak nesting period for migratory birds is late May and June and construction should be avoided

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 February 3 5_BLM\BLM_020509_meeting minutes_flash24hr.doc during the nesting period from April 15 – July 15. The BLM is concerned about permanent structures removing nesting habitat. Surveys are not necessary but the Project should mitigate for take (unavoidable). Nest dragging prior to construction activities, native grassland mapping, and off-site mitigation measures are all recommendations for reducing impacts and mitigating take. The BLM feels that even after reclamation activities occur, it will take at least two breeding seasons for the area to become suitable nesting habitat again. The area north of the Missouri River contains a diverse make-up of sensitive grassland breeding birds and construction of the Project has the potential to have population affects. Finally, the grasshopper sparrow is not a BLM sensitive species and the black-crowned night heron is.

Mountain Plover:

AECOM: The USFWS recommended surveys for the mountain plover in prairie dog towns and bentonite fields in Valley County. BLM: Recommends conducting surveys within suitable habitat.

Burrowing Owl:

AECOM: Surveys will be conducted in prairie dog towns crossed by the route.

BLM: Burrowing owls also utilize ground squirrel burrows and small mammal burrows and recommends surveying in these locations as well.

Swainson's Hawk and Ferruginous Hawk:

AECOM: The aerial raptor nest surveys and the biological field surveys did not identify any active swainson hawk or ferruginous hawk nests along the route in Montana. Additional, raptor nest surveys are scheduled for 2009 and prior to construction. Also mentioned discussions with MFWP that include relocating existing ferruginous hawk nests off the Project route.

BLM: Would like to see the nest location data from the aerial surveys.

AECOM: Can send them a CD with that information.

BLM: Agreed that transplanting ferruginous hawk nests have been done successfully and can send AECOM historic nest site data.

Sturgeon Chub, Sicklefin Chub, Sauger, Paddlefish, Shortnose Gar, Blue Sucker, Northern Redbelly Dace x Finescale Dace: AECOM: No impacts to these species because HDD methods will be used to cross the Missouri, Milk, and Yellowstone Rivers. Frenchmen Creek is not planned for HDD activities and may impact the Northern redbelly dace x finescale dace. Also, Boxelder Creek is not planned for HDD activities and may impact the sauger. In addition, no suitable habitat for sensitive fish species is crossed by the route on BLM lands.

BLM: Agreed. No impacts to fish species and no further mitigation measures or survey requirements.

Reptiles/Amphibians:

AECOM: Included discussions from earlier meeting with MFWP and J. Carlson (BLM) regarding the need to have an established protocol for the Environmental Inspector to follow in order to protect snake hibernacula and preventing snakes from entering an open trench and not being able to escape during construction. They would like to propose having a specialist available that would be able to handle hibernating snakes that might be overturned during construction activities.

BLM: Also mentioned that surveys for reptile and amphibian species would not mitigate for impacts during construction. Their presence should be assumed and off-site mitigation should be established for these species. The MFWP will be meeting in Canada to discuss policies used for mitigating loss of reptile and amphibian habitat.

Big Game:

AECOM: Big game sensitive range exclusions will be adhered to on BLM lands only.

BLM: Exclusion dates include December 1 - March 31 in Valley through Fallon Counties and December 1 - May 15 in Phillips County but TransCanada may be able to apply for exceptions.

Follow-up Required / Requested

BLM Needs:

- Lat/Long Coordinates for Prairie Dog Towns;
- Links to MFSA;
- Map of known sage grouse lek sites (send map created for MFSA that includes sage grouse lek locations and sensitive species (natural heritage data request) locations;
- CD of raptor nest locations from aerial surveys.

J:\10000\10623-007-Trow-KXL Phase II\Agency Communications\Biological\Biological contacts\Meeting notes\2009 February 4 5_BLM\BLM_020509_meeting minutes_flash24hr.doc More information on access roads.

AECOM needs:

- Contact Christy Duboise (MFWP) for bald eagle data base;
- Contact USFWS on sage grouse lek database;
- Historic raptor nest site data;
- Contact MFWP regarding the results of meetings in Canada regarding reptile/amphibian mitigation;
- Sagebrush locations based on the database Kent Undlin has put together (mentioned by Windy Davis).

TransCanada - Keystone XL Phase II Pipeline Meeting Summary E-Mail Posting Form

Meeting Location: Nebraska Game and Parks Commission, Lincoln, NE

Date & Time: February 19, 2009 / 2:00 p.m. - 3:45 p.m.

Keystone Team Members: Patti Lorenz

Agency Contact Information:

Name	Organization	Title	Phone / E-mail address
John Cochnar	USFWS – Grand Island, NE	Deputy Nebraska Field Supervisor	308-382-6468 x 20 / John_Cochnar@fws.gov
Carey Grell	NGPC	Environmental Analyst Realty and Environmental Services Division	402-471-5423 / carey.grell@nebraska.gov
Rick Schneider	NGPC	Coordinator/Ecologist Nebraska Natural Heritage Program	402-471-5569 / rick.schneider@nebraska.gov
Mike Fritz	NGPC	Zoologist - Nebraska Natural Heritage Program	402-471-5419 / mike.fritz@nebraska.gov

Meeting Notes

Project Updates:

- Department Of State will be the lead federal agency.
- Construction for Phase II scheduled for 2011.
- The EIS is scheduled for September 2009.
- BA is tentatively scheduled for summer/fall 2009. The BA will encompass both Phase I and II of the project, therefore, incorporating multiple regional USFWS office.
- The 2008 biological surveys were completed along the entire route where landowner access was granted. Another round of surveys is scheduled for Spring 2009 to encompass denied assess lands and route adjustments.

Objective:

Objective for this meeting is to finalize sensitive species mitigation/BMPs/survey protocols. Concluding the discussions at today's meeting, AECOM will adjust these documents and re-submit them to TransCanada and the agencies for final concurrence.

Species Specific Information

Black-footed Ferret: No further mitigation requirements.

J:\10000\10623-007-Trow-KXL Phase II\Documents (Working)\ER\ER working documents 2009 update\WORKING UPDATE FILES\Finalized for Word Processing\Appendices for ER\Appendix F\Meetings\2009 Meetings_Steele City\Nebraska\021909~1.DOC

1

Whooping Crane:

Keystone will not be permitting the transmission lines but will add recommendations to bury and or mark appropriately overhead lines. Regarding centerline construction, the USFWS recommends developing a separate MOU, similar to the Keystone Project, for the whooping crane.

Piping Plover/Least Tern:

Data was presented from the 2008 surveys at the Niobrara, Loup and Platte rivers. HDD methods will eliminate impacts to hesting habitat. NGPC would like AECOM to verify with Joel Jorgensen (NGPC), but feels that no further surveys are needed if HDD construction at these rivers occurs more than 100 yards from the banks of the rivers. Additionally, if a nest site is found, a 0.25 mile buffer from the nest will be applied. Therefore, if construction occurs during the nesting period, additional nesting surveys would be required.

Water depletion impacts are a concern for the tern and plover. The Keystone XL Project should abide by the same conservation measures as Keystone to avoid impacts.

American Burying Beetle:

The USFWS and NGPC recommend trap and relocate (and possibly bait away) measures for the American burying beetle in Nebraska. Information was relayed that South Dakota does not recommend surveys, instead, recommends establishing off-site mitigation banking.

Take of any sensitive species is currently prohibited under Nebraska State law. However, that may change prior to 2011 and NGPC will notify AECOM with any changes. Therefore, the Keystone XL Project cannot mitigate for take of the American burying beetle. Permanent structures will also require additional conservation measures such as lighting requirements, to direct the light to a smaller area.

In addition, the USFWS feels that due to the sensitivity of the sandhills habitat, disturbed beetle habitat will never be restored to predisturbed conditions and will forever be altered. Additional compensation measures (e.g., restoration ratios of 2:1, necking down, etc.) may be required in addition to survey efforts.

Western Prairie Fringed Orchid:

Surveys are recommended within the known range in Nebraska. NGPC will provide maps of the known range along the project route. NGPC contractors Jerry and Bob Steinauer may be available to provide known locations to survey crews as an example of suitable habitat along the route. NGPC recommends conducting a habitat assessment prior to the flowering period to narrow down locations for occurrence surveys.

Pallid Sturgeon:

The Project will not directly impact the pallid sturgeon because it is outside of its known range in Nebraska. However, water depletion impacts are a concern for the pallid sturgeon. The Keystone XL Project should abide by the same conservation measures as Keystone to avoid impacts.

Eskimo Curlew:

NGPC would like this species added to the potential occurrence list. No further mitigation requirements or surveys will be required and the project is not likely to impact this species.

River Otter:

HDD would prevent impacts to river otters. NGPC would like AECOM to verify with Sam Wilson (NGPC), but feels that no further surveys are needed if HDD construction at the Niobrara, Cedar, Loup, and Platte rivers occurs more than 100 yards from the banks of the rivers.

Additional rivers recommended for river otter surveys include the North Branch Elkhorn, Elkhorn, and South Fork Elkhorn. Because these rivers are not planned for HDD crossings, surveys for denning sites should be conducted prior to construction. The surveys should be concerned only with den sites being directly impacted (e.g. within the construction ROW) by ground disturbing activities.

Bald Eagle:

The bald eagle is no longer state listed in Nebraska. Data was presented from the 2008 and 2009 aerial nest and winter roost surveys. All additional conservation measures will be evaluated by the USFWS under the Bald and Golden Eagle Protection Act (BGEPA).

Raptors:

Data was presented from the 2008 aerial nest surveys. NGPC would like a set of maps with the nest locations. Regarding raptor nest

J:\10000\10623-007-Trow-KXL Phase II\Documents (Working)\ER\ER working documents 2009 update\WORKING UPDATE 2 FILES\Finalized for Word Processing\Appendices for ER\Appendix F\Meetings\2009 Meetings_Steele City\Nebraska\021909~1.DOC buffer requirements, NGPC would like to use the Colorado Division of Wildlife (CDOW) standards. The USFWS will review those standards and the REX-West guidelines to confirm.

Blacknose Shiner, Northern Redbelly Dace, and Finescale Dace:

Surveys are recommended and NGPC would also like to include the pearl dace and plains topminnow to the list. These species are not listed but are considered sensitive and occur within similar habitat to those listed above. NGPC recommends noting their occurrence during the other sensitive fish surveys.

There are only 5 known blacknose shiner populations in Nebraska. NGPC would like AECOM to reconsult on additional conservation measures if blacknose shiners are found within any streams surveyed for the Project. NGPC would like to recommend HDD any crossings with positive findings.

The surveyors must have qualifications for these specific species and will need to obtain a permit from NGPC.

Massasauga:

Surveys are recommended and AECOM will send NGPC the survey protocol used during the REX-West project for confirmation. Additionally, suitable habitat should include areas adjacent to the ROW. NGPC has concerns about direct impacts (i.e., crushing by equipment) to individuals as they move from burrows to upland foraging habitat. Similar concerns for the timber rattlesnake were expressed but this species is not state listed. NGPC recommends a daily survey within suitable habitat prior to construction activities to clear the area of snakes.

Small White Lady's Slipper:

NGPC will provide range maps for future survey efforts (See Western Prairie Fringed Orchid for conservation measures).

MBTA:

TBD with the finalization of the Keystone MBTA Conservation Agreement.

Discussion/Action Items

- The project route crosses all private land in Nebraska.
- NGPC will send AECOM shapefiles they have developed with the special status species' ranges and native ecosystems.
- NGPC would like to know more specific location information on the Steele City Tank Farm. Recommend not locating it within the Steele City Canyons due to the locations of sensitive fens.
- The USFWS recommends sending a draft BA prior to submitting the final draft for review.
- USFWS Nebraska will coordinate with USFWS South Dakota on American burying beetle conservation measures.
- NGPC recommends contacting Joel Jorgensen and Sam Wilson for specifics on river otter and least tern/piping plover conservation measures.
- AECOM will send NGPC a CD with the results of the 2008 aerial raptor nest surveys and massasauga protocol.
- USFWS will confirm raptor nest buffer zones from the REX-West Project and CDOW standards.

Meeting between US Fish and Wildlife Service (USFWS), Keystone, U.S. Department of State (DOS) and ENTRIX, Inc. regarding Endangered Species Act (ESA) Consultation for the Keystone XL Pipeline Project

Date: September 3, 2010 **Time:** 9:00 a.m. to 11:00 a.m. Central Time

Meeting Attendees:

John Cochnar, USFWS Grand Island, NE Martha Tacha, USFWS Grand Island, NE Brooke Stansberry, USFWS Grand Island, NE Michael George, USFWS Grand Island, NE Sarena Selbo, USFWS Denver, CO Jon Schmidt, Trow Matt Comeaux. Trow Jonathan Minton, Trow Matthew Kindred, Trow Dave Beckmeyer, Perennial Environmental Services John Beaver, Westech in Helena, MT Wyatt Hoback, University of Nebraska Michael Stewart, DOS Lynn Noel, ENTRIX, Inc. Kevin Freeman, ENTRIX, Inc. Kimberly Demuth, ENTRIX, Inc. Joe Rubin, ENTRIX, Inc.

Purpose: Discuss USFWS comments on the Draft Biological Assessment (BA). The initial Draft BA was considered incomplete, and this meeting is to discuss Keystone's responses and what is needed to go forward with formal consultation.

- 1) USFWS requests formal consultation on the Interior Least Tern, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid. Need to identify conservation measures for the procedure the power providers to consult on the power lines. Power providers have regulations that require the formal consultation required by the lead federal agency. The project as a whole needs to be analyzed at the consultation stage to evaluate the direct and indirect effects to the project.
 - a. Utility conservation measures need to be discussed at the broader, formal level. This will be in the form of a letter from the power provider regarding the species. The power stations are being built in 2-3 years, and the power providers need to consult with USFWS about the impact of design on the environment.
 - b. The Draft Environmental Impact Statement (DEIS) provides information regarding distribution lines that is up-to-date as of April of 2010. Include analysis of power lines in the BA.
 - c. In Nebraska (NE), USFWS is in the process of dealing with distribution line issues with the Nebraska Public Power District (NPPD); with the

information in the DEIS, they can consult on those lines and then USFWS can comeback and reinitiate on any changes from the DEIS or any additional lines.

- d. Letters of commitment from power providers would be valuable to have for the Keystone XL Project. A letter of commitment is sufficient, and an MOU or MOA is not necessary for this process.
 - i. The letter should state that utility companies will meet their Section 7 obligations, and that an analysis in the letter should also reference the BA. There needs to be enough detail in the BA to discuss how alternatives will be used to minimize impacts. This can include marking distribution lines, burying lines when possible, and avoiding habitats used by ESA species.
 - ii. If local power providers need to change the route, they can coordinate with USFWS but officially consult with DOS.
 - iii. Once BA is redrafted, want to keep in an informal process until all parties are satisfied and then finalize. May see 1-2 more draft versions before calling it final.
 - iv. NE USFWS field effort is coordinating the entire effort across 5 states and 2 regions, and they need to go to other offices to make sure the BA is in line with the other states.
 - v. When considering the timeframe for the BA, no party wants the schedule to slip past the end of January for the Final Environmental Impact Statement (FEIS); over the next couple of months will try to wrap this up. This is a realistic timeline as far as USFWS is concerned.
 - vi. If the FEIS differs from the final BA, then may need to reinitiate consultation; generally consult on preferred alternatives, not multiple alternatives. Need a decision to be made about the preferred alternative, want to make sure that any rerouting of the pipeline may affect other species that are not currently affected by the pipeline route. USFWS is making an assumption about the preferred alternative at this point and time. There will be refinements to the route over time may be some revisions over time, but while the alignment may shift slightly, the route will not change. Can capture most of the situations that may arise during construction through the informal process.
 - vii. USFWS needs to make sure the consultation process is correctly followed.
- 2) Insufficient information on the Interior Least Tern provided for counties in Texas.
 - a. A report was submitted, but USFWS had not heard back from the Arlington office with their comments. The report should be sufficient to address this issue. John Cochnar will follow-up internally with the Arlington office on this issue.

- 3) Inadequate conservation measures for Whooping Crane, Interior Lease Tern, and Piping Plover. The USFWS want to make sure that while Keystone is undertaking construction, it makes sure that ESA species are not present on the work site. Surveys completed 2 weeks before construction and not during actual construction are insufficient. The main discussion revolves around three river crossings as well as the Playa wetlands.
 - a. USFWS suggests that Keystone should have a brief survey of any habitat area for the Whooping Cranes in the morning and afternoon before starting the equipment. This should be a brief delay in construction, as the cranes will leave the area to feed by mid-morning. USFWS has the tracking program for the migrational corridor, and will pass on information to Keystone if Whooping Cranes are in the area.
 - b. TransCanada wants to have flexible language in the BA to accommodate the realities of construction, so if a Whooping Crane lands during a directional drilling operation, there should be no problem. USFWS does not have a problem with this scenario as long as the drilling does not begin in the presence of the cranes.
 - c. An Environmental Inspector (EI) could be qualified to do a sweep of the area to look for Whooping Cranes if trained to identify the cranes. If cranes were sighted, then the EM should contact the local USFWS office. Keystone will make sure the proper monitoring is in place and incorporate this into the BA.
 - d. For terns and plovers, make sure there are no nesting pairs within a quarter-mile of the construction sites. The protocol does not delay construction, just monitoring to ensure due diligence.
 - e. John Cochnar will send Keystone the protocols for Whooping Crane monitoring.
- 4) Develop conservation measures for loss of grassland nesting habitat for Sprague's Pipit in northwest South Dakota (SD) and Montana (MT) following BLM recommendations found in the DEIS.
 - a. This is a newly identified issue for the Project, and Keystone missed the window to survey this migratory bird and is unsure how to address this issue. Currently the Sprague's Pipit is not a candidate or ESA protected species, but next week the USFWS is sending determination to the Federal Register for adding the Pipit to the list. Currently it is at the discretion of the DOS whether to include this issue in formal consultation. Because this species has not come up before, and it is not yet a candidate species, Keystone should also have a discussion with local SD and MT agencies.
 - b. Keystone has defined restoration measures per Natural Resources Conservation Service (NRCS) and other agencies, and so sees this as a temporary impact on the habitat and will need more information about this species.
 - c. Construction outside of nesting, restoration, and monitoring of native prairie may be satisfactory for remediating any problems posed to the Sprague's Pipit.

- 5) Western Prairie Fringed Orchid Keystone surveyed a 300' corridor. The Western Prairie Fringed Orchid population found does not fall within the construction right-of-way (ROW).
 - a. No direct or indirect area of impact currently found in the project corridor; avoided the area where the orchid was found.
 - b. If an orchid is found during the construction phase, the BA would need to describe the measures taken to deal with this species.
 - c. Orchids do not transplant well, if found in the project area in private lands surveyed after condemnation, the identification of orchids could result in reinitiating consultation.
 - d. Any areas that have suitable habitat that have not yet been surveyed need consultation with the USFWS. Keystone can mitigate for impacts based on an assumption that the plants are present in habitat areas currently not surveyed.
 - e. If Keystone can complete surveys for orchids in areas currently not accessible, then the BA can have flexible language regarding the mitigation. Reasonable and prudent measures for the orchid included that Keystone could get a conservation easement and protect alternative orchids. Language in the BA could address how this is handled. If the time was right and a survey could be completed when orchids could be present, then a survey would be completed, but if not then a non-protected orchid population could be found and protected through a conservation easement. Keystone may decide to forgo a survey and just implement mitigation measures.
 - f. Keystone would be allowed the flexibility to either survey for Western Prairie Fringed Orchid when they are blooming, and if they find a flower then they could take necessary measures. However, due to the nature of the orchid, not finding a flower does not indicate that the flower is not present.
 - g. If they could not survey or choose not to survey, undergo an assumption that the flowers are present, and they could undertake mitigation measures such as protecting a known group of orchids with a conservation easement. Can work with Gary Steinhauer, NE botanist, who can provide information about protecting flowers.
- 6) Texas Prairie Dawn-flower
 - a. USFWS will speak internally with the Texas office and see if a similar measure to the orchid would work for the dawn-flower. Keystone would like to discuss survey results with the Clear lake office and the remaining surveys before committing to assuming presence and mitigating for habitat impacts.
 - b. Need to speak with the Clear Lake USFWS office to make sure the mitigation measures discussed with the Western Prairie Fringed Orchid would be sufficient for the Texas Prairie Dawn-flower.

- 7) Texas Trailing Phlox
 - a. USFWS needs to discuss this internally with the Clear Lake USFWS office to find out what changed; will clarify and get back to Keystone and DOS.
- 8) HDD within the North and South Canadian Rivers
 - a. The purpose of the 300' buffer is for the critical habitat for the Arkansas River Shiner. The biggest issue is the clearing of trees. The only clearing would be a nominal amount to lay cables down. Keystone is using previously cleared corridors such as farmers' roads at rivers for access to water.
- 9) American Burying Beetle
 - a. Keystone would like to discuss the conservation measures in a detailed plan with the 4 different USFWS field offices at a separate meeting. The meeting will take place on an as-yet-determined Tuesday in September at the Grand Island USFWS facility. John Cochnar will ask the other offices about a time that will work for them, and Dr. Hoback will join the meeting.
 - b. When addressing vegetation maintenance impacts, areas where construction won't be able to start immediately will incorporate measures to reduce take. Need to allow for a certain level of take with a formal take statement.
- 10) Migratory Bird Treaty Act (MBTA) Region 2 requests inclusion in discussion of MBTA compliance. Construction ROW reviewed to identify areas to clear prior to nesting season. Pre-clearing areas for Tulsa have been reviewed and accepted, but there was no response for Clear Lake USFWS office. Region 2 – Arlington has also agreed to pre-clearing and has reviewed the project mapping.

Keystone will submit the aerial alignment sheets and their habitat assessment to John Cochnar at the FWS for dissemination. Need to send aerial alignment sheets and a conservation plan on other areas that are not pre-cleared to the Arlington office, and need a conservation plan with that office. Keystone will get maps together with the construction ROW, and John Cochnar will speak with the offices. Meeting between U.S. Fish and Wildlife Service, Keystone, Nebraska Game Fish and Parks, and Cardno ENTRIX regarding the Keystone XL Pipeline Project Section 7 Endangered Species Act Formal Consultation for the American Burying Beetle

Date: October 12, 2010

John Cochnar, USFWS Grand Island, Nebraska Martha Tacha, USFWS Grand Island, Nebraska Mike George, USFWS Grand Island, Nebraska Bob Harms, USFWS Grand Island, Nebraska Brook Stansberry, USFWS Grand Island, Nebraska Serena Selbo, USFWS Denver, Colorado Sharon Whitmore, USFWS Hayley Dikeman OK USFWS Tulsa, Oklahoma Charlene Bessken, USFWS Pierre, South Dakota Michelle Cook, Nebraska Game and Parks Carey Grell, Nebraska Game and Parks Mike Fritz, Nebraska Games and Parks Commission Michelle Koch, Nebraska Games and Parks Commission Jon Schmidt, Keystone Matt Comeaux, Keystone Dave Beckmeyer, Keystone Jonathan Minton, Keystone Steve Craycroft, Keystone John Buchanon, Keystone Wyatt Hoback, University of Nebraska, Keystone Lynn Noel, Cardno ENTRIX, Department of State Kevin Freeman, Cardno ENTRIX, Department of State Joe Rubin, Cardno ENTRIX, Department of State

Purpose: discuss comments on the Draft Biological Assessment (BA) concerning the American Burying Beetle and the formal Section 7 consultation.

- 1) Current status of survey work done by Keystone
 - a. Phase III covers the Gulf Coast Segment of the Keystone XL Pipeline in Oklahoma and Texas
 - i. Keystone has completed presence/absence ABB trapping surveys around the pipeline Right of Way (ROW) in Texas, and did not find any ABB. Came to the conclusion there are no effects on the ABB in Texas.
 - ii. Desktop habitat assessments for ABB in OK were completed through a desktop assessment and historic analysis of occurrences.
 - b. Phase IV covers the Steele City Segment of the Keystone XL Pipeline project in Nebraska and South Dakota.
 - i. Completed desktop habitat assessment in SD and NE

- ii. Completed presence/absence trapping along the ROW in NE
 - 1. The surveys in NE were positive; approx 100 miles from the SD border south was found to have ABB. The remaining 200 mi of suitable habitat do not have ABB
- iii. NE Survey: Roughly 100 pipeline miles with ABB; starting around milepost (MP) 91 in Wheeler County and go to MP 597; several points where no beetles were found and several points where high densities of beetles were found.
- c. Dr. Wyatt Hoback developed a 5 point scale to rank suitability of habitat through visual survey before trapping.
 - i. For the pipeline route, rated the habitat on a mile-by-mile basis
 - ii. From South to North, did not see any ABB until Wheeler County, where the habitats were highly ranked.
 - iii. Had numbers around 0.2 per trap night close to the SD border, 0.5 in Wheeler county; but in Polk county had as many as 26 per trap night, which was higher than any other previously trapped areas.
 - iv. ABB is active in two seasons- early June to early July and Early August to September.
- 2) Keystone's current plans regarding ABB habitat
 - a. In Texas, there is no plan because the project will have no effect.
 - b. Based on desktop habitat data, Keystone would contribute cost value of trapping surveys to a conservation fund for suitable habitat in OK.
 - c. In NE, would trap and relocate ABB along the ROW prior to construction, then restore the habitat after construction.
 - d. Based on existing survey data, Keystone would contribute cost value of trapping surveys to a conservation fund for suitable habitat in SD.
 - e. Upon completion of the pipeline construction, Keystone would restore the ROW to the original grades and reseed native grasses as outlined in the CMRP. No ongoing vegetation maintenance activities are planned in agricultural or active pasture were ABB habitat is found.
 - f. Annual monitoring is planned, as described in the CMR plan.
- 3) Description of the pipeline construction process
 - a. Construction ROW is 110' wide, potentially wider based on geography, and will be narrower over water bodies and wetlands. Comes out to 13.3 acres per mile of potentially disturbed land. The permanent ROW is 50' which is not necessarily centered within the 110' construction ROW.
 - b. The process can be described as a moving assembly line or train of construction- basically, there is clearing, where the vegetation is removed from the ROW; grading, where topsoil is stripped from the working area to create a level working surface; trench excavation, using backhoes or wheeled excavators; the pipe will then be transported out to the ROW and be bent to fit the trench; welding, where the pipeline is formed into long lengths; placement, where the pipe is placed in the trench; fill-in of the trench; topsoil replacement; and finally remediation/revegetation.

- c. This works as a moving assembly line, with one spread being constructed over a 4-5 month period of time with the clearing and grading going first at about a mile per day, then the trenching will follow, etc.
- d. The original contours will be restored after construction; basically they create a road and then restore this area to pre-construction conditions.Pipeline burial in some areas with a restored contour could be deeper than the general pipeline burial depth of four feet.
- e. There are also different types of temporary staging areas for pipe storage, equipment marshalling, etc. These storage yards are located every 30-60 miles, and are generally located in pre-disturbed areas such as farmland. Keystone has worked with state agencies to locate temporary areas for camps for the workers, which are restored and reclaimed, and reverts back to the landowners. Any workspace away from the ROW would be restored in the same manner as the ROW.
- f. These off-ROW yards are located approximately every 30-60 miles, generally in agricultural land; pipeyards are generally 30 acres and contractor yards are generally 50 acres. In NE there is 1 pump station and 1 pipeyard where the ABB may be present. These are moderate habitat quality areas based on numbers per trap night. The habitat ratings of these areas are moderate to low; and the pump station is in a hay field.

Project effects on ABB: soil compaction, heat dissipation, soil moisture, pump stations and construction camps

- 1) Effects of soil compaction on the ABB
 - a. Because of the heavy equipment used on the project and because the ABB burrows, there is a question about the compaction effects on the ABB.
 - i. The CMR plan describes the measures to remediate compaction; The entire acreage will be decompacted; tools such as the deepshank subsoiler, the vibrashank, and others will be used to decompact a minimum of 18 inches of the subsoil. The topsoil will go over the decompacted subsoil.
 - ii. Decompacted soil contours will match the surrounding areas. The BA states the testing measures and parameters for decompaction as well as specifying the methods for testing.
 - iii. Keystone no longer incorporates any blasting in its plan; the revised plan will use ripping instead of blasting.
- 2) Discussion of effects of pipeline heat dissipation on the ABB
 - i. There is a question about the long-term effects of the pipe on the habitat because of the heat the pipe may give off.
 - ii. Jon Schmidt- modeling done shows that temperature was isolated most of the year to about 20 inches around the diameter of the pipeline, depending on soil type.
 - 1. Question about the effect of the pipeline on the frost line, which may not allow the beetle to go dormant during the

winter. Need process and procedures for 2-3 years down the road

- 2. In the CMR plan, there will be monitoring of restoration success.
- 3. The Keystone CMR plan provides annual vegetation monitoring, and USFWS can be added to the distribution list.
- 4. The heat modeling study which is part of the DEIS models heat dissipation from the pipeline based on the burial depth, geographic area, and season; other studies have been done by other industries. A copy of the study is in the appendix of the DEIS.
 - a. Kevin- this is a specific thermal model for a specific set of conditions, and a literature search will not be an effective tool to evaluate the study. Peer review is a more appropriate method.
 - b. The model was run on a 900,000 bpd case, which is no longer applicable.

i. USFWS will review the document and make a decision as to whether to have the document peer reviewed

- 3) Discussion on impact of Moisture to ABB
 - a. ABB are sensitive to moisture; Keystone is required to reseed and remulch to restore vegetation to the same as before the pipeline was built. This is included in the CMR plan.
 - i. USACE has specific conditions for wetlands, which Keystone is meeting per NWP conditions and the CMRP.
 - ii. Keystone waived jurisdiction of wetlands, and all wetlands will get the same treatment during construction and restoration.
- 4) Discussion on Construction Camp's impact to ABB.
 - a. Camps are required in 2 locations in South Dakota;
 - i. Camps are planned in Mead county and Tripp county South Dakota near Colome;
 - ii. Because beetles have been found near Colome, the USFWS prefers Keystone look for areas of unsuitable habitat to place the worker camp, such as farmland.
 - iii. Charlene- anything south of HWY 18 is of major concern for the ABB, and is concerned about the habitat in this area; Area is mostly grassland, but restoration will take 2-3 years; even with trap and relocate, it is possible several beetles will be killed;
 - b. No camps are planned in NE at this time.
 - c. Camps are temporary for the period of construction, and will be restored back to the original condition like the ROW.

d. Camp locations are determined based upon construction spread locations and minimizing impacts to roads and local residents.

Remediation plan for soil and discussion of state and federal laws.

- 1) Remediation plan for soil in ABB Habitat
 - a. ABB buries carcasses in the ground; they look for grasses they can bury through; burial times are long, so loose sandy loam is great for the beetles, while clay is not. Dry sand is also avoided by the beetles.
 - b. The vegetation component and land use discussion needs to be separated out in the BA; the intent is to revegetate with the original vegetation, but the land owner does have some say to the restoration plan.
 - i. Keystone is contracting with a major seed supplier to acquire and blend the seed for the project; gotten from a number of sources. The seed mixes are NRCS approved.
 - c. Wyatt has provided suggestions as to the vegetative varieties that work best for ABB habitats.
 - d. Keystone would like the USFWS offices from different states to come to a consensus on what is desired for restoration.
- 2) Discussion of differences between state and federal law regarding the ABB, as well as the different determinations on a state-by-state basis.
 - a. (Michelle Koch from the Game and Parks Commission) State law for NE does not allow a trap and relocate of any state-listed endangered species;
 - b. There is a question about if the NE USFWS prefers the trap and relocate method and the NE Game and Parks does not.
 - i. State and Federal Authorities need to work together to agree on whether the federal take permit and mitigation will suffice for NE officials.
 - c. Uniqueness of NE is because the state law mimics the federal law and is very stringent Additional measures may be needed to comply with the state law.

i. Need consistency on trap and relocation before construction

- d. Keystone is dealing with 4 FWS field offices that take 4 different approaches to deal with the species. Looking for a way to go forward on this issue. USFWS needs to streamline and standardize the responses. Can all agree on doing formal consultation.
- e. What is needed for closure?
 - i. Assuming the 110' ROW is the project area; will take into account what Wyatt has due to qualify habitat along the route and his survey results in TX and NE.
 - ii. Need an accepted, consistent mitigation ratio across USFWS; will speak internally and make a decision.
 - 1. Mitigation approach should be consistent among states; 5 habitat levels of quality, and need all parties to review Dr. Hoback's report.
Additional information that should be included in the BA

- 1) The USFWS would like to have more information for their decision regarding the mitigation ratio:
 - a. Dr. Hoback's most recent report was sent to all meeting attendees.
 - b. The next revision of the BA will include details on:
 - i. Geographic area impacted
 - 1. Boundaries, surveys, capture rate, survey areas and habitat mapping (1-5 ranked habitat suitability) GIS shapefiles and maps sent out for NE, SD, OK, TX
 - ii. Habitat
 - iii. Construction disturbance to suitable habitat areas
 - 1. Impacts to ABB
 - iv. Thorough description of the CMR plan including:
 - 1. Reseeding
 - 2. Reclamation
 - 3. Decompaction
 - v. Discussion of difference between pre- and post-construction regarding:
 - 1. Compaction
 - 2. Heat
 - 3. Moisture
 - c. The BA and accompanying documentation needs to connect the dots- how does construction impact the ABB, and how is Keystone going to alleviate/mitigate the effect.
 - d. Keystone will need a specific list of people who need the AB and reports;
 - i. John Cochnar will give to Jon Schmidt and Lynn Noel a list of people for distribution.
 - ii. Jon Schmidt can set-up an ftp site to let meeting attendees access the documents if required.
 - e. Need a letter from DOS; will send draft BA's until the service deems that BA provides the necessary information to provide a biological opinion.
 - f. USFWS will have the internal discussion to make a decision on the mitigation ratio.
 - g. In 2-3 weeks the USFWS will make a determination
 - i. USFWS want a formal consultation for the ABB based entirely on the BA; all of the issues must be in the BA or referenced in the BA.

Action Items

- a. Martha Tacha will find correspondence for the original request for mitigation.
- b. USFWS personnel will look at the provided literature for pipeline modeling (Appendix L of the DEIS) and determine if they would like to request the model be submitted for peer review.

- c. Keystone will also look for additional literature on pipeline temperature effects.
- d. John Cochnar will provide Jon Schmidt, Keystone and Lynn Noel, Cardno ENTIRX & DOS, a distribution list of USFWS personnel.
- e. Keystone will provide GIS shapefiles and Maps with the habitat suitability (1-5 scale) as provided by Dr. Wyatt Hoback, as well as Dr. Hoback's latest report on the ABB.
- f. USFWS will try to come to an internal consensus on mitigation ratios and other remediation recommendations for Keystone.
 - i. The internal USFWS meeting was set for November 2^{nd} at 11:00am Central.
- g. A new draft BA will be provided to the USFWS as a Word document.

Comprehensive Consultation Meeting Summaries

Meeting between US Fish and Wildlife Service (USFWS), Keystone, U.S. Department of State (DOS) and ENTRIX, Inc. regarding Endangered Species Act (ESA) Consultation for the Keystone XL Pipeline Project

Date: September 3, 2010 **Time:** 9:00 a.m. to 11:00 a.m. Central Time

Meeting Attendees:

John Cochnar, USFWS Grand Island, NE Martha Tacha, USFWS Grand Island, NE Brooke Stansberry, USFWS Grand Island, NE Michael George, USFWS Grand Island, NE Sarena Selbo, USFWS Denver, CO Jon Schmidt, Trow Matt Comeaux. Trow Jonathan Minton, Trow Matthew Kindred, Trow Dave Beckmeyer, Perennial Environmental Services John Beaver, Westech in Helena, MT Wyatt Hoback, University of Nebraska Michael Stewart, DOS Lynn Noel, ENTRIX, Inc. Kevin Freeman, ENTRIX, Inc. Kimberly Demuth, ENTRIX, Inc. Joe Rubin, ENTRIX, Inc.

Purpose: Discuss USFWS comments on the Draft Biological Assessment (BA). The initial Draft BA was considered incomplete, and this meeting is to discuss Keystone's responses and what is needed to go forward with formal consultation.

- 1) USFWS requests formal consultation on the Interior Least Tern, Piping Plover, Whooping Crane, and Western Prairie Fringed Orchid. Need to identify conservation measures for the procedure the power providers to consult on the power lines. Power providers have regulations that require the formal consultation required by the lead federal agency. The project as a whole needs to be analyzed at the consultation stage to evaluate the direct and indirect effects to the project.
 - a. Utility conservation measures need to be discussed at the broader, formal level. This will be in the form of a letter from the power provider regarding the species. The power stations are being built in 2-3 years, and the power providers need to consult with USFWS about the impact of design on the environment.
 - b. The Draft Environmental Impact Statement (DEIS) provides information regarding distribution lines that is up-to-date as of April of 2010. Include analysis of power lines in the BA.
 - c. In Nebraska (NE), USFWS is in the process of dealing with distribution line issues with the Nebraska Public Power District (NPPD); with the

information in the DEIS, they can consult on those lines and then USFWS can comeback and reinitiate on any changes from the DEIS or any additional lines.

- d. Letters of commitment from power providers would be valuable to have for the Keystone XL Project. A letter of commitment is sufficient, and an MOU or MOA is not necessary for this process.
 - i. The letter should state that utility companies will meet their Section 7 obligations, and that an analysis in the letter should also reference the BA. There needs to be enough detail in the BA to discuss how alternatives will be used to minimize impacts. This can include marking distribution lines, burying lines when possible, and avoiding habitats used by ESA species.
 - ii. If local power providers need to change the route, they can coordinate with USFWS but officially consult with DOS.
 - iii. Once BA is redrafted, want to keep in an informal process until all parties are satisfied and then finalize. May see 1-2 more draft versions before calling it final.
 - iv. NE USFWS field effort is coordinating the entire effort across 5 states and 2 regions, and they need to go to other offices to make sure the BA is in line with the other states.
 - v. When considering the timeframe for the BA, no party wants the schedule to slip past the end of January for the Final Environmental Impact Statement (FEIS); over the next couple of months will try to wrap this up. This is a realistic timeline as far as USFWS is concerned.
 - vi. If the FEIS differs from the final BA, then may need to reinitiate consultation; generally consult on preferred alternatives, not multiple alternatives. Need a decision to be made about the preferred alternative, want to make sure that any rerouting of the pipeline may affect other species that are not currently affected by the pipeline route. USFWS is making an assumption about the preferred alternative at this point and time. There will be refinements to the route over time may be some revisions over time, but while the alignment may shift slightly, the route will not change. Can capture most of the situations that may arise during construction through the informal process.
 - vii. USFWS needs to make sure the consultation process is correctly followed.
- 2) Insufficient information on the Interior Least Tern provided for counties in Texas.
 - a. A report was submitted, but USFWS had not heard back from the Arlington office with their comments. The report should be sufficient to address this issue. John Cochnar will follow-up internally with the Arlington office on this issue.

- 3) Inadequate conservation measures for Whooping Crane, Interior Lease Tern, and Piping Plover. The USFWS want to make sure that while Keystone is undertaking construction, it makes sure that ESA species are not present on the work site. Surveys completed 2 weeks before construction and not during actual construction are insufficient. The main discussion revolves around three river crossings as well as the Playa wetlands.
 - a. USFWS suggests that Keystone should have a brief survey of any habitat area for the Whooping Cranes in the morning and afternoon before starting the equipment. This should be a brief delay in construction, as the cranes will leave the area to feed by mid-morning. USFWS has the tracking program for the migrational corridor, and will pass on information to Keystone if Whooping Cranes are in the area.
 - b. TransCanada wants to have flexible language in the BA to accommodate the realities of construction, so if a Whooping Crane lands during a directional drilling operation, there should be no problem. USFWS does not have a problem with this scenario as long as the drilling does not begin in the presence of the cranes.
 - c. An Environmental Inspector (EI) could be qualified to do a sweep of the area to look for Whooping Cranes if trained to identify the cranes. If cranes were sighted, then the EM should contact the local USFWS office. Keystone will make sure the proper monitoring is in place and incorporate this into the BA.
 - d. For terns and plovers, make sure there are no nesting pairs within a quarter-mile of the construction sites. The protocol does not delay construction, just monitoring to ensure due diligence.
 - e. John Cochnar will send Keystone the protocols for Whooping Crane monitoring.
- 4) Develop conservation measures for loss of grassland nesting habitat for Sprague's Pipit in northwest South Dakota (SD) and Montana (MT) following BLM recommendations found in the DEIS.
 - a. This is a newly identified issue for the Project, and Keystone missed the window to survey this migratory bird and is unsure how to address this issue. Currently the Sprague's Pipit is not a candidate or ESA protected species, but next week the USFWS is sending determination to the Federal Register for adding the Pipit to the list. Currently it is at the discretion of the DOS whether to include this issue in formal consultation. Because this species has not come up before, and it is not yet a candidate species, Keystone should also have a discussion with local SD and MT agencies.
 - b. Keystone has defined restoration measures per Natural Resources Conservation Service (NRCS) and other agencies, and so sees this as a temporary impact on the habitat and will need more information about this species.
 - c. Construction outside of nesting, restoration, and monitoring of native prairie may be satisfactory for remediating any problems posed to the Sprague's Pipit.

- 5) Western Prairie Fringed Orchid Keystone surveyed a 300' corridor. The Western Prairie Fringed Orchid population found does not fall within the construction right-of-way (ROW).
 - a. No direct or indirect area of impact currently found in the project corridor; avoided the area where the orchid was found.
 - b. If an orchid is found during the construction phase, the BA would need to describe the measures taken to deal with this species.
 - c. Orchids do not transplant well, if found in the project area in private lands surveyed after condemnation, the identification of orchids could result in reinitiating consultation.
 - d. Any areas that have suitable habitat that have not yet been surveyed need consultation with the USFWS. Keystone can mitigate for impacts based on an assumption that the plants are present in habitat areas currently not surveyed.
 - e. If Keystone can complete surveys for orchids in areas currently not accessible, then the BA can have flexible language regarding the mitigation. Reasonable and prudent measures for the orchid included that Keystone could get a conservation easement and protect alternative orchids. Language in the BA could address how this is handled. If the time was right and a survey could be completed when orchids could be present, then a survey would be completed, but if not then a non-protected orchid population could be found and protected through a conservation easement. Keystone may decide to forgo a survey and just implement mitigation measures.
 - f. Keystone would be allowed the flexibility to either survey for Western Prairie Fringed Orchid when they are blooming, and if they find a flower then they could take necessary measures. However, due to the nature of the orchid, not finding a flower does not indicate that the flower is not present.
 - g. If they could not survey or choose not to survey, undergo an assumption that the flowers are present, and they could undertake mitigation measures such as protecting a known group of orchids with a conservation easement. Can work with Gary Steinhauer, NE botanist, who can provide information about protecting flowers.
- 6) Texas Prairie Dawn-flower
 - a. USFWS will speak internally with the Texas office and see if a similar measure to the orchid would work for the dawn-flower. Keystone would like to discuss survey results with the Clear lake office and the remaining surveys before committing to assuming presence and mitigating for habitat impacts.
 - b. Need to speak with the Clear Lake USFWS office to make sure the mitigation measures discussed with the Western Prairie Fringed Orchid would be sufficient for the Texas Prairie Dawn-flower.

- 7) Texas Trailing Phlox
 - a. USFWS needs to discuss this internally with the Clear Lake USFWS office to find out what changed; will clarify and get back to Keystone and DOS.
- 8) HDD within the North and South Canadian Rivers
 - a. The purpose of the 300' buffer is for the critical habitat for the Arkansas River Shiner. The biggest issue is the clearing of trees. The only clearing would be a nominal amount to lay cables down. Keystone is using previously cleared corridors such as farmers' roads at rivers for access to water.
- 9) American Burying Beetle
 - a. Keystone would like to discuss the conservation measures in a detailed plan with the 4 different USFWS field offices at a separate meeting. The meeting will take place on an as-yet-determined Tuesday in September at the Grand Island USFWS facility. John Cochnar will ask the other offices about a time that will work for them, and Dr. Hoback will join the meeting.
 - b. When addressing vegetation maintenance impacts, areas where construction won't be able to start immediately will incorporate measures to reduce take. Need to allow for a certain level of take with a formal take statement.
- 10) Migratory Bird Treaty Act (MBTA) Region 2 requests inclusion in discussion of MBTA compliance. Construction ROW reviewed to identify areas to clear prior to nesting season. Pre-clearing areas for Tulsa have been reviewed and accepted, but there was no response for Clear Lake USFWS office. Region 2 – Arlington has also agreed to pre-clearing and has reviewed the project mapping.

Keystone will submit the aerial alignment sheets and their habitat assessment to John Cochnar at the FWS for dissemination. Need to send aerial alignment sheets and a conservation plan on other areas that are not pre-cleared to the Arlington office, and need a conservation plan with that office. Keystone will get maps together with the construction ROW, and John Cochnar will speak with the offices. **Arturo Vale/R2/FWS/DOI** 09/16/2010 03:06 PM

ToMartha Tacha/R6/FWS/DOI@FWS

ccEdith Erfling/R2/FWS/DOI@FWS, Moni Belton/R2/FWS/DOI@FWS

SubjectRe: Fw: Keystone's responses to FWS comments

Our response to Keystone's responses:

Page 1-8, sixth paragraph:

DBA: Texas Trailing Phlox

CLESFLO Comments: On January 6, 2009, CLESFLO staff participated in a meeting with Keystone representatives, during which time, concerns for listed species including the Texas trailing phlox in Hardin County were raised (see attached meeting notes).

Page 3-26, fifth paragraph:

DBA: Proposed presence of Texas prairie dawn in the project area.

CLESFLO Comments: CLESFLO maintains that we cannot concur with the determination that the proposed pipeline may affect, but is not likely to adversely affect the Texas prairie dawn. We look forward to evaluating the remaining survey results.

A. J. Vale U. S. Fish & Wildlife Service 17629 El Camino Real, Suite 211 Houston, TX 77058-3051 281-286-8282 ext. 223 fax. 281-481-5882 Meeting between U.S. Fish and Wildlife Service, Keystone, Nebraska Game Fish and Parks, and Cardno ENTRIX regarding the Keystone XL Pipeline Project Section 7 Endangered Species Act Formal Consultation for the American Burying Beetle

Date: October 12, 2010

John Cochnar, USFWS Grand Island, Nebraska Martha Tacha, USFWS Grand Island, Nebraska Mike George, USFWS Grand Island, Nebraska Bob Harms, USFWS Grand Island, Nebraska Brook Stansberry, USFWS Grand Island, Nebraska Serena Selbo, USFWS Denver, Colorado Sharon Whitmore, USFWS Hayley Dikeman OK USFWS Tulsa, Oklahoma Charlene Bessken, USFWS Pierre, South Dakota Michelle Cook, Nebraska Game and Parks Carey Grell, Nebraska Game and Parks Mike Fritz, Nebraska Games and Parks Commission Michelle Koch, Nebraska Games and Parks Commission Jon Schmidt, Keystone Matt Comeaux, Keystone Dave Beckmeyer, Keystone Jonathan Minton, Keystone Steve Craycroft, Keystone John Buccannon, Keystone Wyatt Hoback, University of Nebraska, Keystone Lynn Noel, Cardno ENTRIX, Department of State Kevin Freeman, Cardno ENTRIX, Department of State Joe Rubin, Cardno ENTRIX, Department of State

Purpose: discuss comments on the Draft Biological Assessment (BA) concerning the American Burying Beetle and the formal Section 7 consultation.

- 1) Current status of survey work done by Keystone
 - a. Phase III covers the gulf coast segment of the Keystone XL Pipeline in Oklahoma and Texas
 - i. Keystone has completed presence/absence ABB trapping surveys around the pipeline Right of Way (ROW) in Texas, and did not find any ABB. Came to the conclusion there are no effects on the ABB in Texas.
 - ii. Desktop habitat assessments for ABB in OK were completed through a desktop assessment and historic analysis of occurrences.
 - b. Phase IV covers the Steele City segment of the Keystone XL Pipeline project in Nebraska and South Dakota.
 - i. Completed desktop habitat assessment in SD

- ii. Completed presence/absence trapping along the ROW in NE
 - 1. The surveys in NE were positive; about 300 miles of the pipeline route; approx 100 miles from the SD boarder going down has found ABB. The bottom 200 mi do not have ABB
- NE Survey: Roughly 100 pipeline miles with ABB; starting around mile 91 in Wheeler County and go to 597; several points where no beetles were found and several points where high densities of beetles were found.
- c. Dr. Wyatt Hoback developed a 5 point scale to rank suitability of habitat through visual survey before trapping.
 - i. For the pipeline route, rated the habitat on a mile-by-mile basis
 - ii. From South to North, did not see any ABB until Wheeler County, where the habitats were highly ranked.
 - iii. Had numbers around 0.2 per trap night close to the SD border, 0.5 in Wheeler county; but in Polk county had as many as 26 per trap night, which was higher than any other previously trapped areas.
 - iv. ABB is active in two seasons- early June to early July and Early August to September.
- 2) Keystone's current plans regarding ABB habitat
 - a. In Texas, there is no plan because none were found along the route.
 - b. Based on desktop habitat data, Keystone would contribute cost value of trapping surveys to a conservation fund for OK.
 - c. In NE, would trap and relocate ABB along the ROW prior to construction, then restore the habitat after construction.
 - d. Based on existing survey data, Keystone would contribute cost value of trapping surveys to a conservation fund for SD.
 - e. No ongoing vegetation maintenance activities are planned because Keystone would restore the ROW to the original grades and replant native grasses.
 - f. Annual monitoring is planned, as described in the CMR plan.
- 3) Description of the pipeline construction process
 - a. Construction ROW is 110' wide, potentially wider based on geography, and will be narrower over water bodies and wetlands. Comes out to 13.3 acres per mile of potentially disturbed land. The permanent ROW is 50' which is not necessarily centered within the 110' construction ROW.
 - b. The process can be described as a moving assembly line or train of operations- basically, there is clearing, where the vegetation is removed from the ROW; grading, where topsoil is stripped from the working area to create a level working surface; trench excavation, using backhoes or wheeled excavators; the pipeline will then be wheeled out to the ROW and be bent to fit the trench; welding, where the pipeline is formed into long lengths; placement, where the pipe is placed in the trench; fill-in of the trench; topsoil replacement; and finally remediation/revegetation.

- c. This works as a moving assembly line, with a spread being constructed is over a 4-5 month period of time with the clearing and grading going first at a mile per day, then the trenching will follow, etc.
- d. The original contours will be restored, with the clean-up material going back to its original position; basically they create a road and then remove the road. Resulting pipeline burial in areas with a restored contour could be deeper than the general pipeline burial depth of four feet.
- e. There are also different types of temporary staging areas for pipe storage, equipment marshalling, etc. These storage yards are located every 30-60 miles, and are generally located in pre-disturbed areas such as farmland. Keystone has worked with state agencies to locate temporary areas for camps for the workers, which are restored and reclaimed, and reverts back to the landowners. Any workspace away from the ROW would be restored in the same manner as the ROW.
- f. Disturbance will happen every 30-60 miles, generally in agricultural land; pipeyard is 30 acres and contractors are 50 acres. In NE there is 1 pump station and 1 pipeyard where the ABB may be present. These are moderate based on numbers per trap night. The habitat ratings of these areas are moderate to low; and the pump station in a hay field.

Project effects on ABB: soil compaction, heat dissipation, soil moisture, and construction camps

- 1) Effects of soil compaction on the ABB
 - a. Because of the heavy equipment used on the project and because the ABB burrows, there is a question about the compaction effects on the ABB.
 - i. The CMR plan describes the measures to remediate compaction; The entire acreage will be decompacted; tools such as the deepshank subsoiler, the vibrashank, and others will be used to decompact a minimum of 18 inches of the subsoil. The topsoil will go over the decompacted subsoil.
 - ii. Decompacted soil will match the surrounding areas. The BA states the testing measures and parameters for decompaction as well as specifying the methods for testing.
 - iii. Keystone no longer incorporates any blasting in its plan; the revised plan will use ripping instead of blasting.
- 2) Discussion of effects of pipeline heat dissipation on the ABB
 - i. There is a question about the long-term effects of the pipe on the habitat because of the heat the pipe may give off.
 - ii. John Schmidt- modeling done shows that temperature was isolated to about 20 inches around the diameter of the pipeline, depending on soil type; it should be well within the 4' of burial for the pipeline
 - 1. Question about the effect of the pipeline on the frost line, which may not allow the beetle to go dormant during the

winter. Need process and procedures for 2-3 years down the road

- 2. In the CMR plan, there will be monitoring of these effects.
- 3. The Keystone CMR plan provides annual vegetation monitoring, and USFWS can be added to the distribution list.
- 4. The heat modeling study which is part of the DEIS models heat dissipation from the pipeline based on the burial depth, geographic area, and season; other studies have been done by other industries. A copy of the study is in the appendix of the DEIS.
 - a. Kevin- this is a specific thermal model for a specific set of conditions, and a literature search will not be an effective tool to evaluate the study. Peer review is a more appropriate method.
 - b. The model was run on a 900,000 bpd case, which is no longer applicable.
 - i. USFWS will review the document and make a decision as to whether to have the document peer reviewed
- 3) Discussion on impact of Moisture to ABB
 - a. ABB are sensitive to moisture; Keystone is required to reseed and remulch to make sure the moisture levels are the same as before the pipeline was built. This is included in the remediation plan.
 - i. USACE has specific conditions for wetlands, which Keystone is meeting per the CMR plan.
 - ii. Keystone waived jurisdiction of wetlands, and all wetlands will get the same treatment during construction and restoration.
- 4) Discussion on Construction Camp's impact to ABB.
 - a. Camps take place up and down the project ROW;
 - i. Camps are planned in Mead county and Tripp county South Dakota near Colome;
 - ii. Because beetles have been found near Colome, the USFWS prefers Keystone look for areas of unsuitable habitat to place the worker camp, such as farmland.
 - iii. Charlene- anything south of HWY 18 is of major concern for the ABB, and is concerned about the habitat in this area; Area is mostly grassland, but restoration will take 2-3 years; even with trap and relocate, several beetles will be killed;
 - b. No camps are planned in NE at this time.
 - c. Camps are temporary for the period of construction, and will be restored back to the original condition like the ROW.

d. Also camps are difficult, if not impossible, to move because of the state and local permits as well as issues with transportation between the camps and the work site.

Remediation plan for soil and discussion of state and federal laws.

- 1) Remediation plan for soil in ABB Habitat
 - a. ABB buries carcasses in the ground; they look for grasses they can bury through; burial times are long, so loose sandy loam is great for the beetles, while clay is not. Dry sand is also avoided by the beetles.
 - b. The vegetation component and land use discussion needs to be separated out in the BA; the intent is to revegetate with the original vegetation, but the land owner does have some say to the restoration plan.
 - i. Keystone is contracting with a major seed supplier to acquire and blend the seed for the project; gotten from a number of sources. The seed mixes are NRCS approved.
 - c. Wyatt has provided suggestions as to the vegetative varieties that work best for ABB habitats.
 - d. Keystone would like the USFWS offices from different states to come to a consensus on what is desired for remediation.
- 2) Discussion of differences between state and federal law regarding the ABB, as well as the different determinations on a state-by-state basis.
 - a. (Michelle Koch from the Game and Parks Commission) State law for NE does not allow a trap and relocate of any state-listed species;
 - b. There is a question about if the NE USFWS prefers the trap and relocate method and the NE Game and Parks does not.
 - i. State and Federal Authorities need to work together to offset impacts with compensation
 - c. Uniqueness of NE is because the state law mimics the federal law and is very stringent Additional measures may be needed to comply with the state law.

i. Need consistency on trap and relocation before construction

- d. Keystone is dealing with 4 states dealing with 4 different ways to deal with the species, and want consistency to deal with the species in a consistent way. Looking for a way to go forward on this issue. USFWS needs to streamline and standardize the responses. Can all agree on doing formal consultation.
- e. What is needed for closure?
 - i. Assuming the 110' ROW is the project area; will take into account what Wyatt has taken into account
 - ii. Need an accepted, consistent mitigation ratio across USFWS; will speak internally and make a decision.
 - 1. Mitigation approach should be consistent among states; 5 habitat levels of quality, and need all parties to review Dr. Hoback's report.

Additional information that should be included in the BA

- 1) The USFWS would like to have more information for their decision regarding the mitigation ratio:
 - a. Dr. Hoback's most recent report will be sent to all meeting attendees.
 - b. The next revision of the BA will include details on:
 - i. Geographic area impacted
 - 1. Boundaries, surveys, capture rate, mile surveys with 1-5 suitability
 - 2. GIS shapefiles and maps sent out for NE, SD, OK, TX
 - ii. Habitat
 - iii. Disturbance to areas
 - 1. Impacts to ABB
 - iv. Thorough description of the Restoration plan including:
 - 1. Reseeding
 - 2. Reclamation
 - 3. Decompaction
 - v. Difference between original area and restored land regarding:
 - 1. Compaction
 - 2. Heat
 - 3. Moisture
 - c. The BA and accompanying documentation needs to connect the dots- how does construction impact the ABB, and how Keystone is going to alleviate the effect.
 - d. Keystone will need a specific list of people who need the AB and reports;
 - i. John Cochnar will give to Jon Schmidt and Lynn Noel a list of people for distribution.
 - ii. Jon Schmidt will set-up an ftp site to let meeting attendees access the documents.
 - e. Need a letter from DOS; will send draft BA's until the service deems that BA provides the necessary information to provide a biological opinion.
 - f. USFWS will have the internal discussion to make a decision on the mitigation ratio.
 - g. In 2-3 weeks the USFWS will make a determination
 - i. USFWS want a formal consultation for the ABB based entirely on the BA; all of the issues must be in the BA or referenced in the BA.

Action Items

- a. Martha Tacha will find correspondence for the original request for mitigation.
- b. USFWS personnel will look at the provided literature for pipeline modeling (Appendix L of the DEIS) and determine if they would like to request the model be submitted for peer review.
- c. Keystone will also look for additional literature on pipeline temperature effects.

- d. John Cochnar will provide Jon Schmidt, Keystone and Lynn Noel, Cardno ENTRIX & DOS, a distribution list of USFWS personnel.
- e. Keystone will provide GIS shapefiles and Maps with the 1-5 scale as provided by Dr. Wyatt Hoback, as well as Dr. Hoback's latest report on the ABB.
- f. USFWS will try to come to an internal consensus on mitigation ratios and other remediation recommendations for Keystone.
 - i. The internal USFWS meeting was set for November 2nd at 11:00am Central.
- g. A new draft BA will be provided to the USFWS as a Word document.

Friday, January 7, 2011 7:00 AM Alaska, 10:00 AM Central, 11:00 AM Eastern

Participants: Martha Tacha, USFWS NE John Cochnar, USFWS NE Mike George, USFWS NE Charlene Besskin, USFWS SD AJ Vale, USFWS TX Joe Rubin, Cardno ENTRIX (on behalf of DOS) Lynn Noel, Cardno ENTRIX (on behalf of DOS): Steve Craycroft, Keystone Dave Beckmeyer, Keystone Matt Comeaux, Trow (on behalf of Keystone) Jon Schmidt, TROW (on behalf of Keystone) Johnathan Minton, TROW (on behalf of Keystone) Jon Beaver, Westech (on behalf of Keystone)

	Minutes
ltem	Focus/Outcomes
Topics	Initial topics The FEIS is currently in preparation and review by DOS. Pending receipt of the presidential permit, Keystone would like to begin construction of the pipeline this year by the end of summer and be in service by 2012.
	Issue 1: Section 2.1.1 – Use of Segment vs. Phases in terminology Stick with segment instead of phases because it is consistent with EIS. All documents and reports should refer to the segment name instead of the phase number for construction. Phase numbers are not directly interchangeable with segment names. Keystone will clearly define the segment references to be consistent with the EIS.
	Issue 2: Section 2.1.6 – Summary of acreages for additional workspaces Numbers change as the project develops, so would prefer to put the numbers in the tables of the final draft BA. While the acreages may be changed after the BA is in place, the acreage provided are likely to be larger than the actual acreage used, which will be refined approaching construction. Any reference to acreages in the BA will be reviewed and revised for consistency with the EIS. Text summaries will be included and additional areas (out of ROW) will be clarified.
	Issue 3: Section 3.1.1 – Black-footed Ferret The prairie dog town close to ROW in MT is too small to reintroduce black footed ferrets. "All prairie dog towns within the ROW are unsuitable for the reintroduction of the BFF, and there are no currently existing Black Footed Ferrets within the ROW." No change to determination required. Martha will provide Lynn with a citation and data regarding this issue, and it will be closed.

	Minutes
ltem	Focus/Outcomes
	Issue 4: Section 3.1.2 – Interior Least Tern The current issue regards the refueling distance; no refueling within the buffer with the exception of drawing water from the three rivers, and that would have secondary containment. The secondary containment units are described in the CMRP. Follows best management practices for containment of fuels per the federal guidelines. Refueling equipment at least 100 feet from waterbodies is standard procedure for protection of waterbodies and wetlands. Keystone will have environmental inspectors enforcing secondary containment and evaluating situations such as where fueling would occur less than 100 feet from water. May need to refuel equipment in larger wetland crossing areas that would be completed according to refueling in water guidelines from the USACE. The highlighted sentences do not conflict and are taken directly from the CMRP. Lynn will remove the quotation marks and revise for clarity.
	The 300' buffer is related to tern habitat, but also relates to the designated critical habitat for the Arkansas River shiner. Within this buffer will be water withdrawal for hydrostatic testing activities and clearing for temporary placement of the tru-tracker cable. Hydrostatic test water would be pumped from an existing access point (no clearing required). Laying the cable will only involve clearing a footpath for the track cables. Would only work if the birds were not present. No additional measures will be added for clearing and human disturbance.
	Issue 5: Section 3.1.3 – Whooping Crane Power provider issues; letter from Grand Electric Cooperative (GEC) requesting comment has been received by FWS SD Field Office. The power line associated with pump station 16 is problematic due to its location through a Sage Grouse lek. Requested C. Bessken to forward GEC letter to Lynn for Appendix J. Regarding the Lamar Electric cooperative letter, the pump station 36 power line is outside the whooping crane corridor. Not aware of any problems with whooping cranes in TX. No whooping crane issues remain related to this comment.
	Issue 6: Section 3.1.4 – Pallid Sturgeon Want to know more about the Tru-tracker wire system, and if this could have an effect on the Pallid Sturgeon. Keystone explained that the drill pilot tool sends out a signal giving its location. This signal is picked up by the Tru-tracker wire, guiding the original drilling tool. This method has been used for years without problem. The wire itself does not emit a signal, it is a receiver about the size of a standard television cable. No anticipated problems with the technology are expected after this explanation.
	Issues 7 & 8: Section 3.1.6 – Texas Prairie Dawn Flower and Texas Trailing Phlox Comments have been accepted and will be incorporated into the BA.
	Issue 9: Section 3.2.1 – Piping Plover Suggested revision in BA p.53; this suggestion was made if there were camps or other work areas outside the ROW affected by construction activities. Not sure what type of operations would require surveys. Suggested deleting the operations part of the sentence, which was accepted by the meeting participants.

	Minutes
ltem	Focus/Outcomes
	Issue 10: Section 3.2.2 – Arkansas River Shiner This is not a migratory fish and occurs year-round in the Canadian River. Need to ensure sufficient water within the river to support the shiner. FWS recommends that the intake for the hydrostatic testing be withdrawn from a tributary, not directly from the Canadian River. Keystone proposes to withdraw a nominal amount of water from the river; maximum withdrawal is approximately 625,000 gal. and will be working with the Oklahoma Water Resources Board (OWRB) for the permit. Based on Keystone's conversations with OWRB, there is no minimum water level for the river or a stipulated level needed for the species. Will abide by the applicable state regulations. Martha will speak with the folks in OK and revisit this topic. There is a vegetative buffer to make sure water quality is maintained. The water withdrawal would be done over the construction period of a month. Keep the vegetation clearing language the way it currently stands.
	Second issue is the Shiner may get caught in the intake pump, even if there is a mesh screen over the intake valve. Main components associated with the screening of the inlet-1) size of mesh- smaller than fish and 2) adequate surface area so fish can swim away from intake valve. This comment was not provided to Keystone along with the other FWS comments on the BA.
	May ask for clarification regarding the hydrostatic testing. Change the language for critical habitat to "would not adversely modify determination"
	Will set-up a follow-up conference with Dave and Hayley Dikeman, Oklahoma Field Office biologist, to further discuss Arkansas shiner issues. Will get back to Lynn if there are any comments to include in the BA. Martha Tacha will set-up a call with Hayley Dikeman, Matt Comeaux, and Dave Beckmeyer.
	Issue 11: Section 3.2.3 – Fringed Orchid Concern is that the orchid does not bloom every year and is difficult to identify when not in bloom. The identification of 1 plant in an area does not minimize the protection of that plant within that area. It usually means more orchids are in the area but are not being detected. Eighteen sites would be affected by the ROW, and mitigation for those sites would be appropriate. However, these share a similar habitat for the ABB, so there would already be mitigation measures in those areas. The reason for the change in the first BA was that during the surveys, only an individual plant was found, not a larger population. This was found on private property and the site is a native hay pasture. The site will be restored with native prairie grasses and the landowner will likely continue to utilize the site as a hay meadow. Will need monitoring per the USACE requirements in the wetlands, and want to acknowledge that additional consultation with the USFWS and mitigation will be required if restoration is not successful. Will add a measure to the BA that monitoring of affected WPFO habitat will happen for a period of five years post construction (per the USACE guidelines for wetlands). If restoration of suitable WPFO habitat is unsuccessful, compensatory mitigation could include purchase of one or more conservation easement(s).
	Issue 12: New 3.1.Section 3.1.6 – Blowout Penstemon Keystone will avoid the major blowouts; these are most often grazed areas and have cattle

	Minutes
Item	Focus/Outcomes
	that create blowouts. Keystone would need to restore the areas due to landowner requirements and pipeline integrity issues. Revegetation is not a conservation measure for the species. Martha recommends not to put the sentence under conservation measures; main conservation measure is to avoid building the pipeline through active blowouts, and the preservation of seed banks in the topsoil. No significant issues remain.
	Issue 13: New Section 3.2.1 – Mountain Plover Received Martha's comments, and these are accepted as long as bullets 2 & 3 are only related to when nests are identified; this is a long period to survey and exclude construction activity unless a mountain plover nest or brood has been located. Change to the surveys; a measure to revise surveys must be done between April 10 th and July 10 th , with 3 surveys conducted a minimum of 14 days apart. Request comes from BLM of the Rollins Area office resource plan. This is a process they use in their resource management plan. Similar to a measure from the Miles City office. This changes the date ranges from the original dates provided for the surveys. The longer dates are stated in the mountain plover survey guidelines for linear surveys. If construction were to occur before July 10, then survey would be done earlier. TransCanada will mark-up and distribute language to participating parties.
	Issue 14: Section 3.1.5 – American Burying Beetle – Need to schedule a call to discuss comments before revising work early next week to go through comments and get a revised report with Dr. Hoback, Hayley, and TC representatives. Matt Comeaux will get times for Dr. Hoback, and based on availability and will set a date/time for the call. Martha will get dates from Hayley Dikeman as well. Will combine call with river shiner issue. *After meeting, it was decided to meet on Wednesday 1/12/11, at 10:30 am Alaska, 2:30 pm Eastern. Lynn will distribute a detailed agenda.*
	Issue 15 : Follow-up – Lynn will be able to turn around revisions to species by the end of next week (January 14 th) with the exception of the ABB. Would like to finish the ABB by the end of the month. Lynn will send revisions re: Arkansas Shiner, Fringed Orchid, and Mountain Plover to the group.
Next Steps	• Martha will send Lynn data about the Black Footed Ferret and Mountain Plover Survey Guidelines.
	• Lynn will send revisions re: Arkansas Shiner, Fringed Orchid, and Mountain Plover to the group. Lynn will also send out the most recent section of the project description from the EIS.
	• Meeting Re: ABB & Arkansas River Shiner on Wednesday, January 12, 2011 at 10:30am Alaska, 11:30am Pacific, 1:30pm Central, 2:30pm Eastern. Lynn will distribute a detailed agenda.
	• Complete revisions and resubmit BA for review/approval by January 31, 2011.

Wednesday, January 12, 2011 10:30 AM Anchorage, 1:30 PM Central, 2:30 PM Eastern Dial-in: 1-800-910-2586, Passcode: 190988

Participants:

US Fish and Wildlife Service: Martha Tacha, John Cochnar, Hayley Dikeman, Charlene Bessken, Mike George, Bob Harms, Daniel Fenner

Nebraska Game and Parks Commission: Michelle Koch, Mike Fritz

Cardno ENTRIX (on behalf of DOS): Lynn Noel, Joe Rubin

TROW Engineering and Others (on behalf of Keystone): Jon Schmidt, Jonathan Minton, Dave Beckmeyer, Stephen Craycroft, Matthew Comeaux, Dr. Wyatt Hoback,

Note: References used during the discussion include pFBA version with Keystone and FWS comments (USFWS 12-30-10 additions to Schmidt Keystone comments on BA 11-29-10.doc) and the two versions of the American burying beetle report (USFWS comments 1-American Burying Beetle survey report - REV1_112910.docx; USFWS comments 2-included on rewritten ABB report from J. Schmidt 11-29-10.doc) provided by Martha.

	Minutes
ltem	Focus/Outcomes
Purpose	• Purpose: (1) Discuss issues related to potential impacts on the Arkansas River shiner from water withdrawals required for the HDD crossings and for hydrostatic pipeline testing from the North and South Canadian rivers in Oklahoma. (2) Discuss comments on the report American Burying Beetle Habitat Assessment Model and Field Survey Results for Nebraska and Texas along the Keystone XL Pipeline Project and Habitat Assessment for South Dakota and the preliminary Final Biological Assessment (BA). This meeting is to discuss specific issues related to the American burying beetle assessment including specific comments related to the habitat model, survey results, and impact assessment; to discuss issues and resolutions, and to develop consensus on the method(s) that will to be used to estimate incidental take.
Topics	ARKANSAS RIVER SHINER ISSUES
	• To avoid impacting the Arkansas River shiner, FWS would prefer that a tributary or a stock pond be used in lieu of screening. Daniel Fenner, the FWS lead for the Arkansas Shiner recovery, questions the effectiveness of implementing the screening procedures.
	Keystone believes it is critical to get water from the sources for horizontal directional drilling (HDD), which is a method of crossing the rivers by drilling that avoids direct impacts to the river bottom and banks. The water is needed to mix with drilling 'mud' to lubricate the drill bit and string and for hydrostatically testing the pipeline segment that is installed under the river.
	Proposed is a two-step procedure to prevent the Arkansas River shiner from being affected by the water draw. 1) use appropriately sized mesh screens to reduce the approach velocity so that fish are not entrained and to prevent the shiner (or other aquatic creatures) from being drawn in and 2) Keystone will not withdrawal water during the spawning season for the shiner.

	Minutes
ltem	Focus/Outcomes
	The size of the mesh would be consistent with that used for window screens (18 x 18 mesh or the equivalent), which should prevent larval stage fish from entering the intake pipe. The mesh size and open area for the screen is designed to prevent fish the size of 2.5 cm from nose to fork of tail from entering. For final consultation, FWS would like to see the final mesh size and an appropriate description in the Arkansas River shiner impact assessment description.
	Keystone will reduce the approach velocity at the screen itself so fish would not be entrained and could swim away from the withdrawal location, based on the 3,000 gallon per minute maximum withdrawal rate. This would be accomplished by increasing the size of the surface area screened around the intake. Project engineers have taken this approach in the past using calculations and over-sizing the screen exclosure. The approach velocity will be 0.36 feet per second for the screened uptake structure. FWS will check if 0.36 feet per second will avoid entrainment. FWS would also like to have a biologist concur on the velocity. * Note: FWS confirmed the 0.36 feet per second value is adequate with a follow-up email communication.
	Keystone will provide FWS with technical specifications on the mesh screens and a diagram describing how the screened exclosures are constructed to reduce the approach velocity for the intake valves.
	Dave Beckmeyer will augment the impact description section of the BA for the Arkansas River shiner in the BA with the descriptions/conditions discussed. The language should be similar although more detailed than the pallid sturgeon discussion because the screening measures for both species are similar. Dave/Lynn will provide the revised language for further review.
	 Keystone will implement the screening outside the spawning period unless an alternate plan is developed in consultation with FWS. FWS will provide dates so the intake avoids spawning season. Per the current measures, Keystone is avoiding drilling June 1 through August 15. The BA will reflect new information, which changes the spawning dates to May 15th through August 15th.
	• FWS is also concerned about the amount of water withdrawn. The withdrawal is relatively small; the volume withdrawn is 270,000 out of the North Canadian River and 625,000 gal out of the [South] Canadian River; this is the total volume withdrawn over a roughly 30 day period based on the HDD drilling rate. Keystone will withdrawal 3,000 gal per minute at max velocity.
	FWS recommends that if river is not flowing, then no water should be taken. Keystone has no issue with this because if the river is not flowing, it would not be a viable water source.
	• Discussion concerning adverse modification of designated critical habitat – limited hand clearing of vegetation for Tru-tracker wire. The maximum clearing for the wire would be a 3' path to allow for variability to snake it through trees. This is not a cut trail, so very little real clearing is required. A single person takes the cable up and through the river. Manual tools would be used for clearing this path. Sample language to include in the BA may be "Minimal hand-clearing using machete or other power hand tools of vegetation within a maximum 3' wide path." With revised language FWS does not see this as being an issue for the Arkansas River shiner designated critical habitat.

	Minutes
ltem	Focus/Outcomes
	AMERICAN BURYING BEETLE (ABB) ISSUES
	 All of the ABB surveys were included in the 2009 and 2010 Keystone reports using a survey protocol approved for current Nebraska projects. The habitat model is the currently accepted standard for northern Nebraska (NE) and southern South Dakota (SD) and is not directly applicable for other areas of the country. A windshield (driving) survey was conducted along the propose pipeline route from public roads using an approved protocol. In areas not accessible by public road, a desktop survey was completed using the high-resolution aerial imagery provided by Keystone. Land cover was assessed on a mile-by-mile basis to find potentially suitable ABB habitats where trapping would take place.
	• FWS requested further clarification to improve their understanding of the five step habitat ranking system. FWS would like to understand how to replicate habitat surveys such as those presented in the ABB report for the Keystone XL Project. Hayley Dikeman requested a separate technical discussion with Dr. Hoback in the near future about his ABB methodology. Otherwise, the NE and SD FWS offices are comfortable with the assessment methodology, and the habitat rating criteria will remain as presented in the survey report.
	 A majority of the habitat in Oklahoma (OK) was ranked by doctoral student Kendra Bauer using a habitat rating system similar to Dr. Hoback's system for northern NE. Dr. Hoback updated this assessment to account for a few minor route deviations and updated mapping and shapefiles have been provided to FWS. Follow-up trapping surveys were not completed because FWS did not recommend surveys. For OK, the process was completed using the same method as the Arkoma pipeline – mitigation would be based on cost per mile of ABB trapping surveys.
	• Do habitats ranked as "fair" require mitigation in the Nebraska Protocol? Dr. Hoback's research found that after over 400 trap nights in "fair" habitat only 3 ABB were captured, resulting in 0.003 ABB per trap night in "fair" habitat. Keystone believes this is not significant enough to raise this issue to the point where mitigation is required.
	Thermal impact discussion
	• Keystone used a 7' wide area centered on the pipeline to calculate thermal impacts, while FWS considers the area of thermal impacts should be 22' wide centered on the pipeline. Dr. Hoback evaluated the temperature model data and determined at what point he would consider there would be a biologically significant difference in temperature, which he considered was the difference between frozen, almost frozen, and unfrozen soils at about out to 3.5 feet on either side of the pipeline or a 7' wide area centered on the pipeline. FWS determined the 22' area by looking at Figures 8, 9, 13, 36, and 38; from Table 2 in Appendix K of the Biological Assessment, which indicates changes in temperature out from the center of the pipeline that would be substantial downstream of the pipeline; and from other information.
	 Participants were not aware of any direct research data for the ABB to evaluate the resulting impacts from a 1-2 degree increase in temperature during winter dormancy. While there is no direct ABB research; studies of other insects have shown effects from changes in microclimate and all participants acknowledge altered temperature as a potential impact. Mechanisms could include: a warmer soil corridor could bring beetles out of sync with their surrounding population. An increase in soil temperature may also affect soil moisture, which could be an issue in both summer and winter.

	Minutes
ltem	Focus/Outcomes
	USFWS indicated that literature does state that insects are affected by changes to the microclimate, which is an adverse effect. Dr. Hoback indicated during the call that he believes the critical component is the point at which the soil is no longer frozen.
	• Keystone would like to have another teleconference that includes engineers responsible for the thermal modeling to further discuss how the referenced model is now beyond worst case scenario. This change is based on the withdrawal of the special permit with PHMSA that has resulted in a reduced maximum flow rate. There is a new model being developed based on the reduced flow rate. However, if an agreement can be made on the current model, that would be preferred. Keystone has no due date on the new model document, but it would be provided to FWS once it has been created.
	ABB Mitigation Discussion
	 Keystone does not have access to all areas along the project corridor, and is opposed to having to wait for surveys before receiving the presidential permit, and would like to propose mitigation without surveying every acre.
	• Keystone will present their mitigation proposal under a separate cover. They propose to provide mitigation for loss of suitable habitat, but not for areas that are suitable habitat but that are not occupied by ABB based on survey information. To get an estimated count for areas where Keystone does not have access, traps will be placed in accessible areas on both ends of an inaccessible segment of ROW. Keystone will then average the number of beetles caught in the traps, and use that data to infer the count for the inaccessible land. FWS would prefer the higher trap count rather than the average trap count be applied to stretches with no trapping estimate. FWS will provide population estimates in SD and OK. Keystones proposed to use the ABB trap data in NE. The largest distance between traps in NE is 7 miles between MP 656 and 646 because there are no public roads in that area.
	• FWS would prefer mitigation based on both the number of beetles and the impacted habitat. Recent court cases are based on ABB counts, so FWS needs to state how many individuals are likely to be taken, as well as the number of impacted acres for each state and the mitigation ratio for these acres. FWS desires a two-fold component for mitigation in Nebraska- mitigate for the number of ABB in areas where ABB have been discovered and mitigate in areas where there is habitat loss. This is in the separate mitigation measure, which can be completed separately from the technical report, but which should be included in the BA.
	 Previous recommendations and potential mitigation has not been consistent across all states because different protocols were established in each state during initial consultations for the Keystone XL project. A habitat assessment was completed for the entire project corridor. There are a number of places in NE where habitat is suitable, but no ABB were captured. These areas are surrounded by unsuitable habitats.
	 For Oklahoma, it was previously agreed that mitigation would be based on the cost per mile of ABB trapping surveys and that this was different from the mitigation required for Nebraska because the survey recommendations and potential mitigation were different. Under the consultation, no surveys were recommended in OK, rather money will be contributed for the mitigation fund.
	 FWS is uncertain whether restoration would be entirely successful, and recommends compensatory mitigation for both temporary impacts and permanent impacts. To FWS

	Minutes
ltem	Focus/Outcomes
	the most important result is to have no net loss of suitable habitat for the ABB across the pipeline corridor.
	 Keystone is committed to complete restoration of the ROW and believes there are no temporary impacts to the ABB. Restoration procedures will be implemented and the ROW will be monitored. Keystone proposes that USFWS agree to Keystone's monitoring for the ROW following US Army Corps of Engineers methods. If restoration is not successful then additional consultation and compensatory mitigation could be addressed in the future similar to what has been proposed for the western prairie fringed orchid.
	Measures to Avoid Take
	 Mowing would be appropriate after trapping if construction were not to directly follow trapping. Mowing would make the ROW unsuitable habitat that would not be re- occupied by ABB. A description of this conservation measure – standard in NE due to constraints from State law that lacks provisions for incidental take, should be included in the BA.
	• Trapping and relocating ABB is only used in NE with no bait-away (due to predator issues). NGPC feels this is best done if construction follows immediately (3 day period) behind the trap and relocate actions during the beetles active period. If the construction occurs while the ABB are dormant, then trap and relocate should be followed by mowing. If trapping and relocating occurred at the end of the July period, and then Keystone performed the conservation conditions, Keystone would be covered through the period of inactivity until the June period of activity, which would restart the conservation conditions.
	 The FWS and NE Parks Commission will provide .pdf copies of all supporting or cited references (including published and in-review manuscripts) or remove citations. Michelle Koch will provide the following NE publications for the Administrative Record: Conservation Measures for ABB (2008) Beetle Trapping Protocol (2008)
	Spill risk assessment (Appendix B)
	 Risk of spill in the BA- Martha has a question about the frequency of detection of small leakages. Remedial actions and offsets would address the acknowledgment of this and the remediation plan in place to deal with this.
	• FWS deals with spill response as an emergency consultation. It is not so much the spill that is the issue for ABB, but the clean-up activities. The life of a pipeline is 50+ years, so an estimation of the length of how many spills happen over x miles and estimate the gallons of spill, and estimate the acres over the 50 year life of the project, all of which is in the spill risk assessment (Appendix B of the BA) and discussed in Section 3.13 of the Environmental Impact Statement.
	 FWS wants notification by a responsible entity in the event of an oil spill. They would like the DOS or other responsible governmental agency to reinitiate consultation in case of an oil spill.
Next	For proceeding with Biological Assessment:

	Minutes
ltem	Focus/Outcomes
Steps	 FWS will make a resolution on Arkansas River shiner swimming speed – completed (1/13/2011) FWS concurs that the 0.36 feet per second intake velocity is acceptable to avoid impacts to the shiner. Dave Beckmeyer will develop a paragraph describing the shiner screening measures and will also provide a diagram. Per an email from Martha, this diagram does not need to be included in the fBA – completed (1/19/2011). ABB protocol with description of when the conservation measures will come into play (Michelle from NE Game and Parks will distribute) – completed (1/13/2011) documents forwarded. Should have everything but the ABB temperature discussion and western prairie fringed orchid conservation measures for the next draft of the BA. Call to discuss the temperature impact issues – Wednesday, Jan 26th at 10:30am Alaska, 1:30pm Central, 2:30pm Eastern Complete revisions and resubmit ABB report for review/approval by January 31st.

Friday, January 26, 2011 10:30 AM Anchorage, 11:30 Pacific, 1:30 PM Central, 2:30 PM Eastern Dial-in: 1-800-910-2586, Passcode: 190988

Participants:

USFWS: Martha Tacha, John Cochnar Cardno ENTRIX (on behalf of DOS): Lynn Noel, Joe Rubin Trow Engineering and Others (on behalf of Keystone): Jon Schmidt, Dave Bechmeyer, Dr. Wyatt Hoback

Note: Participants please have pFBA version with Keystone and FWS comments (**USFWS 12-30-10 additions to Schmidt Keystone comments on BA 11-29-10.doc**) and Appendix K – *Pipeline Temperature Effects Study* available for reference to specific comments and be prepared to discuss/suggest appropriate revisions.

	Agenda
ltem	Focus/Outcomes
Introductions	Participants
Purpose	• Purpose: discuss comments on the preliminary Final Biological Assessment (BA). This meeting is to discuss specific issues related to pipeline temperature effects and the American burying beetle assessment and to revise/approve issue resolutions.
Topics	Issue 1: Appendix K – Heat Dissipation Model
	Factors included in model that effect amount of heat generated and area for dissipation: flow rate, soil type, soil water content, other factors?
	Assumptions in model – validity, robustness
	Actual numbers versus graphics – difficult to read changes in temperature - approximated degrees from graphs
	Other model discussions?
	 Issue 2: Appendix K – Review effects
	Heat effects review in Appendix K: soil temperature, biological activity, vegetation (early emergence, increased productivity), soil water availability (drying), altered freeze-thaw timing
	Hypothesized versus measured/observed effects:

	Agenda
ltem	Focus/Outcomes
	 Issue 3: Section 3.1.5 – Thermal Effects
	Why thermal effects were generally considered to be of greater significant in northern portions of the Project than in southern portions – seasonally consistent at ~5° at 6 inch depth in Oklahoma and Texas.
	Suggested Text Clarification: Seasonal differences in soil temperatures resulting from heat generated by oil flow through the pipeline would not be noticeable at the ground surface but would consistently elevate soil temperature 6 inches below the surface by several degrees year round above the pipeline in southern regions (Oklahoma and Texas).
	• Issue 4: Section 3.1.5 – American Burying Beetle (primary issues)
	Thermal effects calculations – 7 feet (out to 3.5 feet from pipeline) versus 22 feet (out to 11 feet from pipeline)
	Suggested Impact Text Revision: Modeled heat dissipation from the pipeline indicates potential seasonal thermal effects on soil freezing to an area within about 7 feet around the pipe compared to background temperatures (Appendix K).
	Thermal effects – likely to have most effect during period when beetles/eggs/larvae are in the ground and when the difference in soil temperatures are most pronounce (spring/fall/winter)?
	What area should be used for estimating permanent impacts within occupied (NE)/suitable habitat (SD, OK) – will need total acres for quantification in BA
	Any Other Outstanding Issues
Next Steps	 Complete revisions and resubmit ABB report for review/approval by Date Complete revisions and resubmit BA for review/approval by Date

Wednesday, February 2, 2011 10:30 AM Anchorage, 11:30 Pacific, 1:30 PM Central, 2:30 PM Eastern Dial-in: 1-800-910-2586, Passcode: 190988

Participants: USFWS: Martha Tacha DOS: Alex Yuan, Keith Benes Cardno ENTRIX (on behalf of DOS): Lynn Noel, John Watkins Trow Engineering and Others (on behalf of Keystone): Jon Schmidt , Dr. Wyatt Hoback, Mike Schmaltz, Matt Comeaux, Jonathan Minton, Steve Craycroft, Dave Beckmeyer, Jessy Benock, Beez Hazen

Note: Participants please have pFBA version with Keystone and FWS comments (**USFWS 12-30-10 additions to Schmidt Keystone comments on BA 11-29-10.doc**) and Appendix K – *Pipeline Temperature Effects Study* available for reference to specific comments.

	Agenda
Item	Focus/Outcomes
Introductions	Participants
Purpose	 Purpose: discuss comments on the preliminary Final Biological Assessment (BA). This meeting is to discuss specific issues related to pipeline temperature model and effects on the American burying beetle.
Topics	Issue 1: Appendix K – Heat Dissipation Model
	Beez Hazen provided a description of how the model was developed and factors that were included in model. Then specific questions were asked and addressed.
	Martha Tacha – Would like to preface discussions with requirements of Section 7 which include a robust analysis of potential impacts during formal consultation. She needs to find out all she can about how the project will potentially affect the species. Martha thanked participants for their time to assist with understanding potential impacts from the project. When there is a range of potential impacts, FWS is required to evaluate the worst case scenario to err on the side of the species. Her questions are not challenges to the information presented, but are intended to clarify and define potential impacts.
	Beez Hazen – In explaining the model, they simulated the different regions crossed by the pipeline. The model takes into account parameters to create a calibration for testing results. Pipe materials and pipe depths play a role. Soil types and ground composition also play an important role. The model then combines the aspects of the pipeline in combination with the ground composition and local climatic conditions.
	Martha Tacha – Silt loam will not be encountered where the ABB are located in Nebraska. The land there is sandier. How would this affect the transfer of heat?
	Beez Hazen – Sand will transfer heat faster than the silt. At 6 inches you would have cooler temperatures. Moisture content is also important, higher

Agenda	
ltem	Focus/Outcomes
	moisture creates faster heat transfer. Ground cover, such as snow and vegetation, will also play a role and can cause variation.
	Martha Tacha – Is there a parameter for longitudinal differences in oil temperature along the pipeline?
	Beez Hazen – Yes, such as being closer to a pump station will have different modeling. The spikes in the Figure 2, Appendix L in the pfBA, signify the pipe is at a pump station location.
	Martha Tacha – What do the figures in the report suggest; the highest or average change in temperatures?
	Beez Hazen – Temperatures from February and August are used as the averages, therefore the data represent the average temperature at the warmest and coldest months at the maximum flow rate. He also pointed out that the temperatures used in the model were the highest temperatures from the pipeline as the oil exited the Pump Station, therefore representing the hottest case model.
	Martha Tacha– Does the width of the trench being dug for the pipe affect the dissipation away from the pipe? This is assuming the material around the pipe is disturbed and repacked?
	Beez Hazen – This could have an effect on heat transfer such as if the top layer was peat. This could also be a factor in permafrost areas. However the composition of the soil in Nebraska would not have much of an impact.
	Jessie Benock – TransCanada could rerun the model to specify the ground conditions for habitat that support ABB; sandy soils and saturated or high moisture content.
	Jon Schmidt – Will provide the mile posts range for region with ABB presence in Nebraska for the modelers.
	Martha Tacha (USFWS) – This would be extremely helpful.
	Action: Keystone agreed to have the model run for sandy, saturated soils and climate conditions for northern Nebraska. Keystone will provide both graphics and data tables for the resulting model. Jon Schmidt will supply the mile post ranges for the regions in Nebraska where ABB are present.
	 Issue 2: Appendix K – Review of resulting effects
	Dr. Wyatt Hoback provided a summary of how he used the information on heat dissipated from the pipeline to evaluate potential effects on the ABB. Wyatt indicated that he had considered the potential effects during the winter in particular on overwintering beetles and eggs as most critical.
	Martha Tacha – Did you have access to the tables or did you use the same report (Appendix K) as Lynn and Martha.
	Wyatt Hoback – I used the same graphics as you initially, but was later supplied with a table of the model data.
	Martha Tacha – Your opinion is that the greatest impact to the ABB would be if the temperature in the winter increases the soil temperature above freezing. Can you explain what is known and what were your assumptions for this conclusion?

Agenda	
Item	Focus/Outcomes
	Wyatt Hoback – The biology of the ABB is not well known. Among insects in general, two general strategies are used by northern insects during overwintering. One strategy is to find and use areas that do not freeze and hibernate until conditions improve. The second strategy is to encase themselves in ice and use an internal antifreeze to avoid freezing to survive until the soil thaws. We are not sure which method the ABB uses. It is highly improbable that ABB engages in both strategies. The only research on winter survival is from Arkansas. The beetles buried themselves 3-20 centimeters into the ground. The ones supplied with food survived better than the ones that did not receive food. The problem with this experiment is that soil and air temperature did not often fall below freezing. The level of soil frost in the Sand Hills of Nebraska averages about 40 inches deep. It is unlikely that ABBs would bury themselves below the frost depth – so they likely use some type of internal antifreeze. The beetles are surviving the winter by entering the ground about 1 September and emerge by June 1. Over these nine months, if they are at a lower temperature, they use less energy; and if they are warmer, they use more energy. If soil temperatures are increased to above freezing the ABB would expend more energy during the winter, then there would be an effect.
	Martha Tacha – So you believe that the ABB are freezing solid for the winter.
	Wyatt Hoback – Yes, but if they are not, then they have to find areas that do not freeze over the winter such as springs or compost piles.
	Martha Tacha – Is there any evidence that beetles move vertically through the soil to adjust their temperatures?
	Wyatt Hoback – It is possible for them to move if they do not freeze solid during the winter. If they are not frozen during the winter then the heat change from the pipeline is not likely to have much effect on the ABB.
	Lynn Noel – Are there overwintering studies that have been conducted on similar species?
	Wyatt Hoback – No other studies have been completed on the physiological aspect of these beetles.
	Martha Tacha – Regarding the emergence in the springtime, what are the environmental cues that trigger emergence?
	Wyatt Hoback – Not sure, but my idea is that emergence is triggered by springtime rains. The beetles are extremely sensitive to moisture. This is just my opinion and there is no science to back up this claim.
	Martha Tacha – Let's assume that the soil temperature where they are buried plays a role in when they emerge. If the soil temperature was 3-4 degrees warmer than normal would this cause them to surface too early?
	Wyatt Hoback - Even if the soil temperature triggered them to surface, once the beetle encountered the low air temperature they should re-bury themselves. The capturing experiments that have been conducted show that very few beetles are captured during the colder nights. The beetles seem to only fly in the warmer conditions.
	Martha Tacha – When they reproduce, the month of July, would the soil

Agenda	
ltem	Focus/Outcomes
	temperature six inches below the surface being 5-6 degrees warmer have an effect on the behavior or metabolism of adults, or the development of juveniles?
	Wyatt Hoback - When they are underground the temperature affects the rate of development so this could have an effect on all the above. If it is warmer during the brooding period, it does have a negative impact. Some laboratory studies have been completed that reflect this statement. 18 Celsius (65 F) is used in the Rhode Island facilities by Lou Perotti for breeding.
	Alex Yuan – Is there any study on how the ABB finds a carcass? Is it related to heat?
	Wyatt Hoback – The ABB finds a carcass based on smell, not temperature. The change in heat should not affect the beetles' ability to find food.
	Martha Tacha – Are there any known temperature thresholds for the ABB.
	Wyatt Hoback – No, 55-60 degrees F for the air temperature is the point which we notice flight, no documentation on soil temperatures.
	Martha Tacha – Will the temperature increases underground caused by the pipeline affect soil moisture?
	Mike Schmaltz – During the year moisture can more easily enter the previously trenched areas because the soil is less compacted. There are also reports that say the more moisture that enters the soil the cooler the soil temperature can remain.
	Issue 3: Section 3.1.5 – Thermal Effects in Other Areas
	What about potential thermal effects in southern portions – seasonally consistent at \sim 5° increase at 6 inch depth in Oklahoma and Texas.
	Martha Tacha – will need to discuss with others, not prepared to discuss this portion of the pipeline.
	Other Questions/Issues
	Martha Tacha – In terms of the process of digging the trench in the sand hills, I would guess there would be a 3 to 1 slope on the banks of the trench. Therefore, you would have a much wider trench through the Sand Hills than other areas. Do you have an estimate of the width of the right-of-way that will be needed for a trench?
	Jon Schmidt– Yes, and that information has been included in development of the workspace areas.
	Martha Tacha – When digging through an area of high water table how do you manage digging a 6-7 foot trench?
	Steve Craycroft – They will work off timber mats and the water may fill the trench.
	Martha Tacha – Is it possible to get deep enough to get four feet of cover?
	Steve Craycroft – Yes, this is a common technique through saturated areas.
	Alex Yuan – How many miles of the pipeline will affect the ABB habitat?
	Martha Tacha – In Nebraska about 100 miles would go through occupied

Agenda	
ltem	Focus/Outcomes
	ABB habitat.
	Jon Schmidt – About 30 miles in South Dakota.
	Wyatt Hoback – According to Haley there is about 100 miles in Oklahoma. Occurrence of ABB in parts of Oklahoma, especially on the pipeline route is questionable because there are two counties that had a historical presence, but these have not been confirmed with recent data. There is also one county with an expected population, but no sampling has been conducted.
	Alex Yuan – Is there enough land elsewhere to accommodate for the lost of ABB habitat from the pipeline?
	Jon Schmidt – That is not fair to evaluate at this time because it has not been established if we are going to set aside land or money for the ABB habitat.
	Alex Yuan – If we had a decision today, how long would it take for TransCanada to get the land?
	Jon Schmidt – The money will be set aside, but the land does not have to been purchased before construction begins.
Next Steps	Complete revisions and resubmit ABB report for review/approval by Date?
	Keystone will submit a revised ABB survey report by February 11, 2011. Additionally, Keystone will submit an ABB mitigation proposal on February 11, 2011.
	 Complete revisions and resubmit revised preliminary final BA for review by Date?
	Hopefully – mid February
	Power distribution lines – measures to include in BA? May be possible to include some – will know within a few days. Concerns primarily within the Whooping Crane migration corridor.

Keystone XL Pipeline Project ESA Consultation re: Introductions, Roles, and Responsibilities

Thursday, February 17, 2011 12:00 PM Anchorage, 1:00 PM Pacific, 3:00 PM Central, 4:00 PM Eastern

Minutes	
Item	Focus/Outcomes
Attendees	USFWS: Martha Tacha, John Cochnar, Mike George DOS: Dr. Nicole Gibson, Alex Yuan Cardno ENTRIX (on behalf of DOS): Lynn Noel, Joe Rubin
Purpose	• Purpose: to introduce Dr. Nicole Gibson and discuss the process for developing the Final Biological Assessment (BA) and Biological Opinion. This meeting is to discuss the progress of the formal consultation and roles and responsibilities in developing mitigation.
Topics	• Roles:
	Nicole Gibson – Dr. Gibson has a Ph.D. from Yale and did her thesis studying primate behavior in Peru. She has a background in sustainable development and has been brought in as a subject matter expert in biology for the Keystone XL EIS. Her role is evolving as the BA process continues.
	Alex Yuan – In charge of the Keystone XL NEPA process for the Department of State.
	John Cochnar – Deputy Field Supervisor has worked with projects for over 26 years, having been the lead in the original Keystone project for USFWS and is the current lead for the FWS.
	Martha Tacha – works on Section 7 consultations and has worked with issues around the whooping crane for 12 years at the FWS. Before working for the USFWS, she worked with the Nebraska Game and Parks Commission.
	Mike George – Project Leader and Supervisor for the NE field office who will be signing the Biological Opinion for the USFWS for Nebraska.
	Issue 1: Outline of Process
	Nebraska has a unique system where the state law regarding endangered species is actually stricter than the federal law, because the state law does not allow for any take. So the evaluation of the BA involves both the USFWS and the NE Game and Parks Commission.
	USFWS needs to undergo formal consultation with DOS and TransCanada because there will be take on this project. Formal consultation for Keystone XL will officially begin upon receipt of acceptable Final BA along with a letter request from DOS. Compensatory mitigation negotiations for ABB will likely continue after formal consultation has been initiated.

Minutes	
ltem	Focus/Outcomes
	 The BA review can take a differing amount of time depending on agreement. The process allows for a 90 day formal review after the USFWS receives a BA, and then the USFWS has 45 days to give a Biological Opinion (BO) in response. If the USFWS agrees with the conservation measures and compensatory mitigation for the project when the BA is presented, then the development of the BO may take a substantially shorter amount of time. This timeframe can be as short as 5 weeks.
	 Issue 2: ABB – impacts and compensatory mitigation
	The USFWS wants ABB compensatory mitigation to be based on habitat rankings, not by occurrence ratings generated from the the surveys completed by Dr. Hoback.
	The USFWS is considering a permanent impact of 22' area around the pipeline ROW due to temperature increases. They are also considering an 88' temporary impact around the ROW because of the land clearing and other disturbances. If landowners request Keystone to restore the land to a condition other than original condition, this may also be considered a permanent impact.
	Martha would like for Keystone to provide the temperature charts that were the basis for the graphs provided in the Hoback ABB report. She would like this data to have a more accurate determination of the soil temperatures that may affect the ABB.
	Issue 3: WPFO – occurrence surveys
	Because the western prairie fringed orchid is a plant, no take permit is required. Compensatory mitigation for the ABB will also cover the western prairie fringed orchid because habitats used are similar. USFWS would like Keystone to consider compensatory mitigation alternatives, including protection of known western prairie fringed orchid populations.
	Keystone could perform long-term monitoring and restoration of habitat or Keystone could contribute to a conservation fund for the USFWS to perform monitoring and restoration. Generally the fund is about 10% of the total cost of restoration. Considering that 8-10% of restoration can fail, and will need further restoration, it may make sense to use the fund instead of Keystone monitoring the site themselves.
	Also, the DOS will not be involved in further mitigation, as it does not have the staff or the purpose to enforce the EIS beyond the ROD.
	 Issue 4: Whooping Crane, Least Tern, Piping Plover - Power line assessments
	There are still migratory bird issues concerning power lines. A final conservation plan is needed for compliance with the Migratory Bird Treaty Act.
	Keystone will need to ensure that treatments regarding power lines are completed by the power providers; it may be necessary to approach recommended measures in a programmatic manner.

Minutes	
ltem	Focus/Outcomes
	Keystone will be responsible for ensuring that the power providers follow the guidelines and measures set by the USFWS.
	 Issue 5: Inclusion of BO as appendix to FEIS
	Completion of the Final BA depends upon consultation and ABB issues, but should be completed around the end of February.
	Preliminary schedule for BO – Depends upon on whether consensus has been reached on all of the conservation measures and compensatory mitigation. It could be completed as quickly as five weeks.
	Preliminary schedule for FEIS – there is no current timeline for the completion of the FEIS, and will keep the USFWS apprised of its status. DOS intends to issue the BO with the FEIS.
Next Steps	 Lynn would like to get the final BA out by the end of February, depending upon the ABB mitigation development and power line measures
	 Development of Biological Opinion depends upon whether the submitted BA mitigation measures are agreed upon. Could be issued as soon as May.
	 Currently, there is no timetable for when the FEIS for this project will be submitted.
Keystone XL Pipeline Project ABB Habitat Assessment & Compensatory Mitigation Negotiations Thursday, March 24, 2011 10:00 AM – 5:00 PM CDT

Participants:

USFWS: Mike George, Martha Tacha, John Cochnar, Hayley Dikeman (morning only), Charlene Bessken,

NGPC: Carey Grell, Michelle Koch, Mike Fritz,

DOS: Dr. K. Nicole Gibson, Alex Yuan (morning only)

Cardno ENTRIX (on behalf of DOS): Lynn Noel, Kevin Freeman, Joe Rubin

Keystone: Jon Schmidt, Stephen Craycroft, Dave Beckmeyer, Michael Schmaltz, Jim White. Dr. W. Wyatt Hoback, Beez Hazen, Matt Comeaux, Jonathan Minton

	Minutes
ltem	Focus/Outcomes
Purpose & Goal	 Purpose: to discuss and resolve assessment and mitigation issues for the American burying beetle (ABB) in order to proceed with finalization of the Biological Assessment (BA). The goal is to develop final conservation measures that are appropriate and protective of the species, that are based on the best available scientific data, and that are legally defensible Mike George will sign the USFWS's Biological Opinion, and ultimately will make devisions for the USFWS
Discussion	Background
	Endangered Species Act Two sections of the Endangered Species Act apply to large linear projects like the proposed Keystone XL Pipeline Project: Section 7 and Section 9.
	 Section 7 is the consultation between federal agencies, in this case between Department of State and the US Fish and Wildlife. Section 7 is enforceable by civil law and any US citizen has standing to sue under this provision of the endangered species act. If USFWS does not properly review the Biological Assessment, then the USFWS will likely be sued under this provision. The threshold for liability in a lawsuit is "arbitrary and capricious," so there is a great deal of time spent on the part of the USFWS making sure decisions have a logical basis. This especially applies to areas where there is an absence of scientific data, because the USFWS needs to base a rationale on available data. Section 9 is enforced criminally, and concerns the take of endangered species. This can include lethal take of individual species members, harassment of an animal, or take of critical habitat. This provision is enforced by the USFWS.
	An Incidental Take Statement issued at the conclusion of the formal Section 7 consultation with the USFWS provides coverage for incidental take under Section 9. Under this coverage, a party will not be criminally liable for incidental take during a project if it operates within the requirements of the Incidental Take Statement.
	Nebraska State Law

Minutes	
ltem	Focus/Outcomes
	The Nebraska (NE) non-game and endangered species act is modeled after the federal endangered species law and it requires any state agency issuing a permit to list impacts to state- listed species. In addition to the federally-listed species, the state law protects state-listed endangered and threatened species.
	The NE law does not allow for incidental take. Any permits from NE DEQ affecting endangered species will all go through a consultation process with NE Game and Parks Commission. Federal agency determinations do not necessarily trump state laws concerning incidental take. When working in Nebraska, companies need to avoid and minimize impacts, and mitigate impacts through due diligence.
	Habitat Assessment for ABB
	Different field offices and regions, 2 and 6, of the USFWS have used differing methods to protect ABB when conducting consultations concerning ABB populations. Dr. Wyatt Hoback completed habitat assessments and trapping for ABB in NE and TX for Keystone to gather data to identify areas along the Project ROW likely to be occupied by ABB and for input and subsequent refinement of his ABB habitat rating system for other projects. Habitat ratings for the Keystone XL Project ROW were not refined after trapping was completed. Trapping surveys for presence/absence of ABB were not recommended by USFWS and consequently not carried out in SD and OK.
	• In Nebraska and South Dakota, the habitats for the ABB along the area of potential effect for the Keystone XL Pipeline Project were rated on a 5 point scale designed by Dr. Hoback in order to focus the ABB trapping survey efforts. Trapping surveys were completed to identify areas occupied by ABB along the Project ROW, for subsequent use by Dr. Hoback to further refine his habitat rating system, to identify potential patchiness in ABB distribution due to habitat fragmentation, and to identify locations of large sustainable ABB populations. The calculation of habitat mitigation based on Dr. Hoback's habitat rating system in Nebraska is considered a better method than what was used previously for other projects crossing the state (such as the Burlington Northern railroad project), and the USFWS in Nebraska would like the Keystone XL project to set a new standard for review concerning the ABB.
	• In South Dakota and Oklahoma, the USFWS recommends habitat rating in the absence of trapping surveys for the evaluation of potential project impacts on the ABB because year-to-year variability in ABB abundance does not support ABB density-based mitigation (i.e., because ABB densities are both spatially and temporally variable). Because ABB trapping was not recommended in SD and OK, Keystone could not use occurrence data to develop abundance-based ABB mitigation for those states. USFWS rationale for a habitat-based mitigation approach follows from the year-to-year variability in abundance and from the fact that take of the species applies to both individual ABBs and the habitat upon which they depend for survival. Trapping surveys are primarily presence/absence surveys, and the USFWS from SD and OK consider that trapping results do not accurately reflect ABB abundance.

Minutes	
ltem	Focus/Outcomes
	USFWS is required to use the best available information to develop the Biological Opinion. The results of ABB trapping will be used by the USFWS to estimate incidental take of individual ABBs in Nebraska. While there may be fragmentation of ABB populations in the South East, this does not appear to be the case in the Sand Hills area. USFWS is only considering habitat impacts in Nebraska for the area along the Project ROW where ABB were found during trapping (i.e., from the SD-NE state line to approximately MP 695.).
	The two assessment methods (habitat-based versus abundance-based from trapping) may not be that divergent in terms of the total number of acres requiring mitigation; however, the USFWS believes that the mitigation plan should not be solely based on ABB abundance information. USFWS requires a habitat-based mitigation plan in the Sand Hills of SD and NE and in OK. The general ABB occurrence information available for each state was used to determine the areas where habitat disturbances will require compensatory mitigation.
	Keystone would prefer that the data collected by Dr. Hoback from the trapping surveys for NE be used to develop the mitigation plan for NE because these data show presence/absence and density of ABB. USFWS prefers to use Dr. Hoback's habitat assessment surveys, instead of using the trapping data, because a habitat based approach adds consistency across all states, even those where ABBs were not trapped. In June 2011, there is a window to determine ABB presence in SD and OK based on trapping. This opportunity could be used by Keystone to determine presence or absence of ABBs in these areas in a manner consistent with the trapping surveys completed in NE and TX. Keystone offered to conduct trapping surveys, however, there was no interest in conducting trapping from SD or OK USFWS offices. There is concern that basing mitigation on habitat assessments alone may lead to mitigation of impacts in areas where ABBs are not present and where they are not expected to be in the future (e.g., prime habitat areas that are surrounded by human activity). Information on surrounding habitat is factored in to Dr. Hoback's habitat ratings. However, USFWS notes that trapping data from only 1 or 2 years may not adequately estimate ABB occurrence or densities because these fluctuate from year to year. Mike George, the signatory for the BO, defers to Dr. Hoback on whether or not habitat surveys are reliable.
	Dr. Hoback – if beetles are present in the habitat at a minimum viable population size, which is not defined, then impacts to the occupied habitat should be eligible for compensatory mitigation. Surveys to determine presence-absence were completed to determine whether mitigation was needed. Habitat was rated first, then trapping surveys were completed. As noted above, the area determine to require mitigation in Nebraska based on occurrence data is from the SD-NE state line to approximately MP 695. Dr. Hoback located isolated pockets of suitable habitat south of that point, but trapping found no ABB. In SD, the area requiring compensatory mitigation based on the best available information are Project areas in Tripp County south of Hwy 18. Areas with apparently suitable habitat north of Hwy 18 do not currently appear to support ABB. In Oklahoma, the area requiring compensatory mitigation includes Project areas in Bryan, Atoka, Coal, and Hughes counties.
	Mike George - ABB impacts will require habitat-based mitigation; the population surveys help support the habitat quality ratings. We will defer to Dr. Hoback on habitat ratings. Using the habitat surveys is the more conservative approach and adds consistency across all states. The trapping survey data will be used to estimate incidental take of individual ABBs. Keystone has

Minutes	
ltem	Focus/Outcomes
	not provided information that has convinced him that Martha Tacha's acreage calculations based on habitat ratings are incorrect. USFWS needs to use a defensible estimate of ABB numbers for the Incidental Take Statement. The BA/BO will provide information for a habitat- based mitigation plan, and will identify the total acres impacted by habitat rating.
	Heat Dissipation Effects on the ABB
	There has been some disagreement between the USFWS and Keystone regarding in the area permanently affected by heat dissipating from the pipeline. The disagreement stemmed from differing interpretations of the results of the thermal model and how far from the pipeline soils may remain unfrozen during the winter months. Keystone interpreted the affected area as 2.5 feet from the pipeline – or a total area of 7 feet wide centered over the pipeline. USFWS concluded that temperature changes could adversely impact the ABB out to 11 feet from the pipeline – or a total area of 22 feet wide centered over the pipeline.
	Dr. Hoback considers that the ABB's strategy for surviving the winter is likely to freeze solid within frozen soils, such that if the pipeline prevents soils from freezing in northern climates, a permanent habitat impact would result. There is uncertainty about ABB overwintering strategies concerning whether beetles freeze during winter, how deeply they bury, and other physiological factors associated with overwinter survival. Beetles that bury along the pipeline route may emerge from the ground earlier into a colder environment than other individuals in the population; which could disrupt their reproductive cycle.
	Dr. Hoback described that overwintering insects generally employ either of 2 survival strategies in northern regions: insects either seek a warm refuge, or they freeze and use a natural type of antifreeze in their circulatory systems such as glycerin to prevent damage from crystal formation. Temperatures above 32°F may be problematic for an overwintering insect if they become active and use metabolic reserves, but temperatures below 32°F would generally reduce metabolism and energy drain would cease when the beetle is frozen.
	Dr. Hoback $- 32^{\circ}$ F should be the determining factor as a biologically differentiated temperature. The soil does not freeze at all at a distance of 7' around the pipeline.
	The model developed to indicate soil temperature differences around the pipeline shows that at 11 feet out and at a depth of 12 inches, the SH4 and SH1 soils do not freeze, although at the background distance of 80 feet and at the 12 inch depth the modeled temperatures reached freezing or below 7 and 6 times, respectively. Additionally, there are observed reductions in the incidence of frozen soils at the 12-inch depth in the remaining 4 soil types modeled. Based on these models the USFWS concluded that the heat dissipating from the operating pipeline will permanently and negatively affect ABB habitat within at least a 22-foot wide corridor centered on the pipeline. The point where there is no difference in temperature from background levels measured at 80 feet from the pipeline would be located between 11 and 80 feet from the pipeline based on the model used for the analyses.
	Mike George – The distance where soil temperature would return to background levels, appears to be somewhere between 11 feet and 80 feet from the pipeline. Pump stations will be

Minutes	
Item	Focus/Outcomes
	permanent impacts. If the soil temperatures are the same as background, then there would be no effect, which is the desired condition. The point of using background levels for comparison is that background would show the temperature profile under ambient conditions and changes relative to ambient conditions would indicate an adverse impact. For Mike George to conclude no effect, soil temperatures should be between those distances. Based on our discussions and Dr. Hoback's evaluation, Mike George is comfortable using the 11 foot distance to evaluate thermal impacts, not the 7 foot distance. Based on the available information the appropriate distance for evaluating heat dissipation effects appears to be 11 feet or an area 22-feet wide centered over the pipeline.
	Seed Mix and Monitoring Discussion
	What constitutes an appropriate seed mix is based on a determination by the USDA NRCS and relevant state agencies (i.e., in Nebraska, the NGPC; in SD, the SDGF). Seed mix can be tricky because there can be a predominant species that grows and displaces native species in the background of the seed mix. Keystone has contacted seed companies to acquire seed for construction next year. Erosion is the biggest concern for Keystone, so they have a vested interest in the native grass coming back over the pipeline. USFWS and NGPC repeatedly made the point that local seed (local ecotype) is necessary for the successful restoration of disturbed prairie areas. Additionally, the invasive nature of some native species that have been cultivated (cultivars) make them unsuitable as an alternative.
	Monitoring is to make sure the appropriate seed mix is established properly. USFWS wants native grasslands restored because of the impact a change in vegetation may have to the listed species. The seed mix should be the same as in the surrounding land area, because if it is a different seed mix then it would be a permanent impact. Most land owners will want continuity for their pastures, and will want to keep what they have now. Keystone needs to restore the construction ROW consistent with the surrounding vegetation. Native seeds of local ecotype consistent with what is presently on the property crossed need to comprise the seed mix.
	USFWS developed a temporal modifier of 6 years (12 percent of permanent impact = 6/50 year Project life), including the year of impact and 5 additional years for revegetation, to adjust for the temporary nature of the pipeline construction disturbance in restored areas. The challenge is that 6 years after the project is completed, a different mix of species may develop which differs from the original and surrounding cover and the USFWS will need to determine if this affects the ABB. However, Keystone maintained that restoration for most locations would be complete within 4 years; and USFWS agreed to a 4 year monitoring window (including the year of construction).
	Financing issues for monitoring – possibilities for financing monitoring include either a restoration fund or possibly bonding; Keystone could take on monitoring with USFWS approval of the monitoring plan, or there could be a monitoring fund established so that USFWS completes the monitoring. Keystone could control expenses for monitoring if it undertakes its own plan; however, if monitoring is completed by the USFWS, then Keystone would only need to set-up a fund.
	USFWS would like to see a restoration fund established to cover the risk that vegetation

	Minutes
ltem	Focus/Outcomes
	restoration fails – Assurance for funds in year 4 for a second vegetation restoration, in case first habitat vegetation restoration is unsuccessful. Failure rate is typically about 10% for native vegetation (e.g., prairie grass). Vegetation in disturbed areas will be restored to original vegetation (consistent with vegetation on either side of the construction ROW). If restoration fails, in part or entirely, funds could be available to cover cost of a second restoration. Keystone could choose how funds would be set aside, options could include bond, escrow, other.
	Mike George – Would like to see a 4 year monitoring plan, and then a contingency plan that would continue for another period if there was failure to re-establish appropriate habitat along the ROW. Success of restoration would be measured by having vegetation with the same composition of native species and/or composition that is consistent on the ROW as compared to off the ROW (to allow for when native species are not originally present). Mike George is comfortable with the restoration and comfortable with using a 4-year period for monitoring. This period is defensible because native plants need 2 years to establish roots and 1 year to show. This needs to be an aggressive plan; success is determined by the mixture of native plants or having the same composition of plants both on and off-ROW. Failure would be when composition to re-establish consistent with adjacent undisturbed areas would result in designation of a permanent ABB habitat impact and the conservation funds would be augmented accordingly.
	Keystone will prepare a monitoring and restoration plan to start negotiations on details of plan. The monitoring and restoration plan would include comparison of on-ROW to off-ROW vegetation.
	Take Issues in Nebraska
	Nebraska Law does not allow for incidental take, and certain regions, including the Sand Hills area, are of great concern from the standpoint of habitat conservation. There are various mitigation measures that can avoid or minimize ABB take. At some interval before construction begins, mitigation measures along the ROW will begin, including trap and relocate, mowing and clearing vegetation, and the removal of carcasses.
	In June, it is critical to keep beetles out of the construction zone because that is when beetles are burying carcasses and reproducing. During the month of June minimizing measures may be performed more than once a week in high traffic sites. Also, Keystone may need to remove carrion every other day.
	Keystone will supply ABB take mitigation plan and vegetation restoration plan to NE Game and Parks Commission for further discussion on this issue.
	Discussion of Additional Identified Impacts in OK:
	<i>Heat Dissipation Impacts on the ABB During the Summer in OK</i> USFWS presented a new analysis of pipeline heat dissipation in Oklahoma and concluded

	Minutes
ltem	Focus/Outcomes
	there may be permanent habitat impacts from heat dissipating from the pipeline during summer months in Oklahoma. Temperatures increase up to 9.2° F relative to background out to 3 feet on either side of the pipeline, which is a 7 foot sub corridor, and that at 12 inches deep these increases could be enough to cause stress impacts on the ABB and affect reproduction.
	Dr. Hoback – there is no study that has specifically looked at how different temperatures affect the breeding of the ABB. A zoo breeding program for ABB shows that lowering temperatures by about 7°F encourages greater reproduction in captivity, but this was not peer reviewed or published. Also, the ABB have an ability to move a carcass depending upon where they find the carcass; a related species has been shown to move a carcass through the soil quite a ways horizontally. This enables the ABB to move away from thermal impact areas.
	Mike George – The information available is too nebulous to support in court; the scientific data are just not there to suggest that this is a permanent impact, therefore, Mike George is not willing to support this as a permanent impact. This impact will be removed from the mitigation plan.
	<i>Forest Impacts in OK</i> In OK, some ABB occur in forested and savannah habitats. The pipeline crosses through areas with trees in OK, and no agreed-upon determination has been made whether this is a temporary or permanent impact to the ABB. Even if the trees re-establish within the construction corridor, re-establishment of forested habitats would be long-term and loss of forest would be considered by USFWS a permanent impact.
	Some trees benefit the ABB, while other trees may be harmful to the ABB. The ABB is a habitat generalist and a carrion specialist. Removing trees may result in habitat fragmentation and edge effects. The ABB occurs in 6 states currently (formerly 32 states); fragmentation occurs through development of transportation corridors, alteration of land cover that results in changes in vegetation such as conversion to agriculture or subdivisions, as well as other developments. Converting sections of contiguous forest into smaller forest fragments separated by grassland may have an adverse impact on the ABB.
	Need to check all charts to make sure nothing is double-counted; thermal impacts are not included in the OK assessment, so the remaining temporary impacts would be the values in the BA minus the trees, as presented in the USFWS distributed spreadsheet. Using the process of adjusting the temporary impacts using a temporal modifier (2-3 years plus impact) resulted in a reduction to 8% of the permanent impact.
	Keystone does not recognize an issue with removal of trees as an impact to ABB habitat in OK. For 90 percent of the proposed Project ROW the Keystone pipeline would parallel existing ROWs, and there do not appear to be any large contiguous undisturbed native forest areas along the route in OK. The Keystone XL pipeline would parallel the MarkWest project which did not require mitigation for ABB impacts.
	Mike George – Keystone will check on the route of the pipeline in relation to tree cover and existing pipelines, utility and transportation corridors to consider possible affects related to trees in OK, and needs to determine if removal of trees has no effect or some effect that should

Minutes	
ltem	Focus/Outcomes
	be mitigated; this decision should be supported with the best available science. Keystone will review this issue and will work on identifying blocks of forested habitats, and then use the ABB habitat rating within the block, according to subjective analysis. This analysis should be completed for the southernmost 4 counties in OK: Bryan, Cole, Atoka, and Hughes. Keystone can complete the assessment on the blocks of trees and make a determination. This is the only area where habitat fragmentation could potentially affect the ABB.
	Access Roads and Mitigation Plan for ABB
	Before construction, trap and relocate mitigation measures will be carried out by Dr. Hoback along the pipeline where ABBs are located. There are significant portions of the Project route through ABB habitats that are not accessible from roads. For trap and relocate activities, traps need to be accessed every morning and ABB should be transported to release locations and released prior to noon that day. Dr. Hoback will consult with NGPC to determine alternative access points and methods to reach ABB habitats for trap and relocate activities. An alternative mitigation measure for use in remote areas could be to use "bait-away" to attract ABB away from the construction area. Bait-away would not require daily access to remote locations. Keystone will investigate alternative methods to minimize impacts to ABB in remote areas where trap and relocate access may not be practicable and will include recommendations in their mitigation plan.
	 Next steps for ABB Keystone and Dr. Hoback will develop language for the BA regarding the methods of minimizing ABB take. The NE Game and Parks Commission need to have evidence and documentation that they have done their job to ensure that the Project does not jeopardize the ABB in the state. The mitigation plan needs to go through a new council and Commissioners' approval before signature from NE Game and Parks Commission. So, it is very early in the state's process, and a change in NE legislation to provide for incidental take will likely not occur prior to construction of the Keystone XL pipeline
	Western Prairie Fringed Orchid Discussion
	Keystone identified potential suitable western prairie fringed orchid (WPFO) habitat areas and has surveyed the areas with access; surveys found a single plant. Keystone has rerouted the pipeline around the wetland containing this plant. Keystone did not identify any other areas with WPFO, although 6 of the 18 areas in NE with potentially suitable habitat were inaccessible. Keystone will return to those locations this year and survey the areas that were inaccessible and those that had a potential to support WPFO or other endangered orchids. Because the WPFO is so difficult to identify when not in bloom, and because it does not bloom every year, the USFWS would like Keystone to include areas where WPFO were not previously discovered, but that contained suitable habitat as part of the endangered species survey for this year.

Minutes	
ltem	Focus/Outcomes
	If WPFO are identified within the Project area, then it would be best to mark and relocate (move) the plant away from any areas where disturbing activities may occur and to other suitable habitat (e.g., the same meadow or wetland). This mitigation measure also applies to the small white ladyslipper which is a NE state listed plant with similar habitat requirements and growth characteristics. Will also move ancillary plants along with the WPFO; will add marking and relocating plants to the conservation measures.
	Agreement for potential locations previously surveyed, it was determined where they would take off the top soil and restore the wetland using similar/same species to the contiguous habitat. The habitat mitigation requirements for the ABB would also apply to the WPFO; spots in wetlands are always restored back to the original; can't change hydrology, or plant composition. Keystone would be required to follow USACE wetland permit requirements for construction and restoration of wetlands which include stripping topsoil and allowing natural revegetation from the native seed bank, re-seeding wetlands would be contrary to permit stipulations. Wetland restoration monitoring would be based on comparison to adjacent undisturbed wetland areas following USACE permit requirements. USFWS would like to see completion of detailed baseline site descriptions prior to construction, with successful restoration based on the return of conditions included in the detailed site description or based on undisturbed areas immediately off the ROW.
Next Steps	 DOS – Finalize and submit Final BA USFWS – Development of Biological Opinion

Keystone XL Pipeline Project ESA Consultation re: Introductions, Roles, and Responsibilities

Thursday, February 17, 2011 12:00 PM Anchorage, 1:00 PM Pacific, 3:00 PM Central, 4:00 PM Eastern

	Minutes
Item	Focus/Outcomes
Attendees	USFWS: Martha Tacha, John Cochnar, Mike George DOS: Dr. Nicole Gibson, Alex Yuan Cardno ENTRIX (on behalf of DOS): Lynn Noel, Joe Rubin
Purpose	• Purpose: to introduce Dr. Nicole Gibson and discuss the process for developing the Final Biological Assessment (BA) and Biological Opinion. This meeting is to discuss the progress of the formal consultation and roles and responsibilities in developing mitigation.
Topics	• Roles:
	Nicole Gibson – Dr. Gibson has a Ph.D. from Yale and did her thesis studying primate behavior in Peru. She has a background in sustainable development and has been brought in as a subject matter expert in biology for the Keystone XL EIS. Her role is evolving as the BA process continues.
	Alex Yuan – In charge of the Keystone XL NEPA process for the Department of State.
	John Cochnar – Deputy Field Supervisor has worked with projects for over 26 years, having been the lead in the original Keystone project for USFWS and is the current lead for the FWS.
	Martha Tacha – works on Section 7 consultations and has worked with issues around the whooping crane for 12 years at the FWS. Before working for the USFWS, she worked with the Nebraska Game and Parks Commission.
	Mike George – Project Leader and Supervisor for the NE field office who will be signing the Biological Opinion for the USFWS for Nebraska.
	Issue 1: Outline of Process
	Nebraska has a unique system where the state law regarding endangered species is actually stricter than the federal law, because the state law does not allow for any take. So the evaluation of the BA involves both the USFWS and the NE Game and Parks Commission.
	USFWS needs to undergo formal consultation with DOS and TransCanada because there will be take on this project. Formal consultation for Keystone XL will officially begin upon receipt of acceptable Final BA along with a letter request from DOS. Compensatory mitigation negotiations for ABB will likely continue after formal consultation has been initiated.

	Minutes
ltem	Focus/Outcomes
	 The BA review can take a differing amount of time depending on agreement. The process allows for a 90 day formal review after the USFWS receives a BA, and then the USFWS has 45 days to give a Biological Opinion (BO) in response. If the USFWS agrees with the conservation measures and compensatory mitigation for the project when the BA is presented, then the development of the BO may take a substantially shorter amount of time. This timeframe can be as short as 5 weeks.
	 Issue 2: ABB – impacts and compensatory mitigation
	The USFWS wants ABB compensatory mitigation to be based on habitat rankings, not by occurrence ratings generated from the the surveys completed by Dr. Hoback.
	The USFWS is considering a permanent impact of 22' area around the pipeline ROW due to temperature increases. They are also considering an 88' temporary impact around the ROW because of the land clearing and other disturbances. If landowners request Keystone to restore the land to a condition other than original condition, this may also be considered a permanent impact.
	Martha would like for Keystone to provide the temperature charts that were the basis for the graphs provided in the Hoback ABB report. She would like this data to have a more accurate determination of the soil temperatures that may affect the ABB.
	Issue 3: WPFO – occurrence surveys
	Because the western prairie fringed orchid is a plant, no take permit is required. Compensatory mitigation for the ABB will also cover the western prairie fringed orchid because habitats used are similar. USFWS would like Keystone to consider compensatory mitigation alternatives, including protection of known western prairie fringed orchid populations.
	Keystone could perform long-term monitoring and restoration of habitat or Keystone could contribute to a conservation fund for the USFWS to perform monitoring and restoration. Generally the fund is about 10% of the total cost of restoration. Considering that 8-10% of restoration can fail, and will need further restoration, it may make sense to use the fund instead of Keystone monitoring the site themselves.
	Also, the DOS will not be involved in further mitigation, as it does not have the staff or the purpose to enforce the EIS beyond the ROD.
	 Issue 4: Whooping Crane, Least Tern, Piping Plover - Power line assessments
	There are still migratory bird issues concerning power lines. A final conservation plan is needed for compliance with the Migratory Bird Treaty Act.
	Keystone will need to ensure that treatments regarding power lines are completed by the power providers; it may be necessary to approach recommended measures in a programmatic manner.

Minutes	
ltem	Focus/Outcomes
	Keystone will be responsible for ensuring that the power providers follow the guidelines and measures set by the USFWS.
	 Issue 5: Inclusion of BO as appendix to FEIS
	Completion of the Final BA depends upon consultation and ABB issues, but should be completed around the end of February.
	Preliminary schedule for BO – Depends upon on whether consensus has been reached on all of the conservation measures and compensatory mitigation. It could be completed as quickly as five weeks.
	Preliminary schedule for FEIS – there is no current timeline for the completion of the FEIS, and will keep the USFWS apprised of its status. DOS intends to issue the BO with the FEIS.
Next Steps	 Lynn would like to get the final BA out by the end of February, depending upon the ABB mitigation development and power line measures
	 Development of Biological Opinion depends upon whether the submitted BA mitigation measures are agreed upon. Could be issued as soon as May.
	 Currently, there is no timetable for when the FEIS for this project will be submitted.

Keystone XL Pipeline Project ABB Habitat Assessment & Compensatory Mitigation Negotiations Thursday, March 24, 2011 10:00 AM – 5:00 PM CDT

Participants:

USFWS: Mike George, Martha Tacha, John Cochnar, Hayley Dikeman (morning only), Charlene Bessken,

NGPC: Carey Grell, Michelle Koch, Mike Fritz,

DOS: Dr. K. Nicole Gibson, Alex Yuan (morning only)

Cardno ENTRIX (on behalf of DOS): Lynn Noel, Kevin Freeman, Joe Rubin

Keystone: Jon Schmidt, Stephen Craycroft, Dave Beckmeyer, Michael Schmaltz, Jim White. Dr. W. Wyatt Hoback, Beez Hazen, Matt Comeaux, Jonathan Minton

	Minutes
ltem	Focus/Outcomes
Purpose & Goal	 Purpose: to discuss and resolve assessment and mitigation issues for the American burying beetle (ABB) in order to proceed with finalization of the Biological Assessment (BA). The goal is to develop final conservation measures that are appropriate and protective of the species, that are based on the best available scientific data, and that are legally defensible Mike George will sign the USFWS's Biological Opinion, and ultimately will make devisions for the USFWS
Discussion	Background
	Endangered Species Act Two sections of the Endangered Species Act apply to large linear projects like the proposed Keystone XL Pipeline Project: Section 7 and Section 9.
	 Section 7 is the consultation between federal agencies, in this case between Department of State and the US Fish and Wildlife. Section 7 is enforceable by civil law and any US citizen has standing to sue under this provision of the endangered species act. If USFWS does not properly review the Biological Assessment, then the USFWS will likely be sued under this provision. The threshold for liability in a lawsuit is "arbitrary and capricious," so there is a great deal of time spent on the part of the USFWS making sure decisions have a logical basis. This especially applies to areas where there is an absence of scientific data, because the USFWS needs to base a rationale on available data. Section 9 is enforced criminally, and concerns the take of endangered species. This can include lethal take of individual species members, harassment of an animal, or take of critical habitat. This provision is enforced by the USFWS.
	An Incidental Take Statement issued at the conclusion of the formal Section 7 consultation with the USFWS provides coverage for incidental take under Section 9. Under this coverage, a party will not be criminally liable for incidental take during a project if it operates within the requirements of the Incidental Take Statement.
	Nebraska State Law

Minutes	
ltem	Focus/Outcomes
	The Nebraska (NE) non-game and endangered species act is modeled after the federal endangered species law and it requires any state agency issuing a permit to list impacts to state- listed species. In addition to the federally-listed species, the state law protects state-listed endangered and threatened species.
	The NE law does not allow for incidental take. Any permits from NE DEQ affecting endangered species will all go through a consultation process with NE Game and Parks Commission. Federal agency determinations do not necessarily trump state laws concerning incidental take. When working in Nebraska, companies need to avoid and minimize impacts, and mitigate impacts through due diligence.
	Habitat Assessment for ABB
	Different field offices and regions, 2 and 6, of the USFWS have used differing methods to protect ABB when conducting consultations concerning ABB populations. Dr. Wyatt Hoback completed habitat assessments and trapping for ABB in NE and TX for Keystone to gather data to identify areas along the Project ROW likely to be occupied by ABB and for input and subsequent refinement of his ABB habitat rating system for other projects. Habitat ratings for the Keystone XL Project ROW were not refined after trapping was completed. Trapping surveys for presence/absence of ABB were not recommended by USFWS and consequently not carried out in SD and OK.
	• In Nebraska and South Dakota, the habitats for the ABB along the area of potential effect for the Keystone XL Pipeline Project were rated on a 5 point scale designed by Dr. Hoback in order to focus the ABB trapping survey efforts. Trapping surveys were completed to identify areas occupied by ABB along the Project ROW, for subsequent use by Dr. Hoback to further refine his habitat rating system, to identify potential patchiness in ABB distribution due to habitat fragmentation, and to identify locations of large sustainable ABB populations. The calculation of habitat mitigation based on Dr. Hoback's habitat rating system in Nebraska is considered a better method than what was used previously for other projects crossing the state (such as the Burlington Northern railroad project), and the USFWS in Nebraska would like the Keystone XL project to set a new standard for review concerning the ABB.
	• In South Dakota and Oklahoma, the USFWS recommends habitat rating in the absence of trapping surveys for the evaluation of potential project impacts on the ABB because year-to-year variability in ABB abundance does not support ABB density-based mitigation (i.e., because ABB densities are both spatially and temporally variable). Because ABB trapping was not recommended in SD and OK, Keystone could not use occurrence data to develop abundance-based ABB mitigation for those states. USFWS rationale for a habitat-based mitigation approach follows from the year-to-year variability in abundance and from the fact that take of the species applies to both individual ABBs and the habitat upon which they depend for survival. Trapping surveys are primarily presence/absence surveys, and the USFWS from SD and OK consider that trapping results do not accurately reflect ABB abundance.

Minutes	
ltem	Focus/Outcomes
	USFWS is required to use the best available information to develop the Biological Opinion. The results of ABB trapping will be used by the USFWS to estimate incidental take of individual ABBs in Nebraska. While there may be fragmentation of ABB populations in the South East, this does not appear to be the case in the Sand Hills area. USFWS is only considering habitat impacts in Nebraska for the area along the Project ROW where ABB were found during trapping (i.e., from the SD-NE state line to approximately MP 695.).
	The two assessment methods (habitat-based versus abundance-based from trapping) may not be that divergent in terms of the total number of acres requiring mitigation; however, the USFWS believes that the mitigation plan should not be solely based on ABB abundance information. USFWS requires a habitat-based mitigation plan in the Sand Hills of SD and NE and in OK. The general ABB occurrence information available for each state was used to determine the areas where habitat disturbances will require compensatory mitigation.
	Keystone would prefer that the data collected by Dr. Hoback from the trapping surveys for NE be used to develop the mitigation plan for NE because these data show presence/absence and density of ABB. USFWS prefers to use Dr. Hoback's habitat assessment surveys, instead of using the trapping data, because a habitat based approach adds consistency across all states, even those where ABBs were not trapped. In June 2011, there is a window to determine ABB presence in SD and OK based on trapping. This opportunity could be used by Keystone to determine presence or absence of ABBs in these areas in a manner consistent with the trapping surveys completed in NE and TX. Keystone offered to conduct trapping surveys, however, there was no interest in conducting trapping from SD or OK USFWS offices. There is concern that basing mitigation on habitat assessments alone may lead to mitigation of impacts in areas where ABBs are not present and where they are not expected to be in the future (e.g., prime habitat areas that are surrounded by human activity). Information on surrounding habitat is factored in to Dr. Hoback's habitat ratings. However, USFWS notes that trapping data from only 1 or 2 years may not adequately estimate ABB occurrence or densities because these fluctuate from year to year. Mike George, the signatory for the BO, defers to Dr. Hoback on whether or not habitat surveys are reliable.
	Dr. Hoback – if beetles are present in the habitat at a minimum viable population size, which is not defined, then impacts to the occupied habitat should be eligible for compensatory mitigation. Surveys to determine presence-absence were completed to determine whether mitigation was needed. Habitat was rated first, then trapping surveys were completed. As noted above, the area determine to require mitigation in Nebraska based on occurrence data is from the SD-NE state line to approximately MP 695. Dr. Hoback located isolated pockets of suitable habitat south of that point, but trapping found no ABB. In SD, the area requiring compensatory mitigation based on the best available information are Project areas in Tripp County south of Hwy 18. Areas with apparently suitable habitat north of Hwy 18 do not currently appear to support ABB. In Oklahoma, the area requiring compensatory mitigation includes Project areas in Bryan, Atoka, Coal, and Hughes counties.
	Mike George - ABB impacts will require habitat-based mitigation; the population surveys help support the habitat quality ratings. We will defer to Dr. Hoback on habitat ratings. Using the habitat surveys is the more conservative approach and adds consistency across all states. The trapping survey data will be used to estimate incidental take of individual ABBs. Keystone has

	Minutes
ltem	Focus/Outcomes
	not provided information that has convinced him that Martha Tacha's acreage calculations based on habitat ratings are incorrect. USFWS needs to use a defensible estimate of ABB numbers for the Incidental Take Statement. The BA/BO will provide information for a habitat- based mitigation plan, and will identify the total acres impacted by habitat rating.
	Heat Dissipation Effects on the ABB
	There has been some disagreement between the USFWS and Keystone regarding in the area permanently affected by heat dissipating from the pipeline. The disagreement stemmed from differing interpretations of the results of the thermal model and how far from the pipeline soils may remain unfrozen during the winter months. Keystone interpreted the affected area as 2.5 feet from the pipeline – or a total area of 7 feet wide centered over the pipeline. USFWS concluded that temperature changes could adversely impact the ABB out to 11 feet from the pipeline – or a total area of 22 feet wide centered over the pipeline.
	Dr. Hoback considers that the ABB's strategy for surviving the winter is likely to freeze solid within frozen soils, such that if the pipeline prevents soils from freezing in northern climates, a permanent habitat impact would result. There is uncertainty about ABB overwintering strategies concerning whether beetles freeze during winter, how deeply they bury, and other physiological factors associated with overwinter survival. Beetles that bury along the pipeline route may emerge from the ground earlier into a colder environment than other individuals in the population; which could disrupt their reproductive cycle.
	Dr. Hoback described that overwintering insects generally employ either of 2 survival strategies in northern regions: insects either seek a warm refuge, or they freeze and use a natural type of antifreeze in their circulatory systems such as glycerin to prevent damage from crystal formation. Temperatures above 32°F may be problematic for an overwintering insect if they become active and use metabolic reserves, but temperatures below 32°F would generally reduce metabolism and energy drain would cease when the beetle is frozen.
	Dr. Hoback $- 32^{\circ}$ F should be the determining factor as a biologically differentiated temperature. The soil does not freeze at all at a distance of 7' around the pipeline.
	The model developed to indicate soil temperature differences around the pipeline shows that at 11 feet out and at a depth of 12 inches, the SH4 and SH1 soils do not freeze, although at the background distance of 80 feet and at the 12 inch depth the modeled temperatures reached freezing or below 7 and 6 times, respectively. Additionally, there are observed reductions in the incidence of frozen soils at the 12-inch depth in the remaining 4 soil types modeled. Based on these models the USFWS concluded that the heat dissipating from the operating pipeline will permanently and negatively affect ABB habitat within at least a 22-foot wide corridor centered on the pipeline. The point where there is no difference in temperature from background levels measured at 80 feet from the pipeline would be located between 11 and 80 feet from the pipeline based on the model used for the analyses.
	Mike George – The distance where soil temperature would return to background levels, appears to be somewhere between 11 feet and 80 feet from the pipeline. Pump stations will be

	Minutes
Item	Focus/Outcomes
	permanent impacts. If the soil temperatures are the same as background, then there would be no effect, which is the desired condition. The point of using background levels for comparison is that background would show the temperature profile under ambient conditions and changes relative to ambient conditions would indicate an adverse impact. For Mike George to conclude no effect, soil temperatures should be between those distances. Based on our discussions and Dr. Hoback's evaluation, Mike George is comfortable using the 11 foot distance to evaluate thermal impacts, not the 7 foot distance. Based on the available information the appropriate distance for evaluating heat dissipation effects appears to be 11 feet or an area 22-feet wide centered over the pipeline.
	Seed Mix and Monitoring Discussion
	What constitutes an appropriate seed mix is based on a determination by the USDA NRCS and relevant state agencies (i.e., in Nebraska, the NGPC; in SD, the SDGF). Seed mix can be tricky because there can be a predominant species that grows and displaces native species in the background of the seed mix. Keystone has contacted seed companies to acquire seed for construction next year. Erosion is the biggest concern for Keystone, so they have a vested interest in the native grass coming back over the pipeline. USFWS and NGPC repeatedly made the point that local seed (local ecotype) is necessary for the successful restoration of disturbed prairie areas. Additionally, the invasive nature of some native species that have been cultivated (cultivars) make them unsuitable as an alternative.
	Monitoring is to make sure the appropriate seed mix is established properly. USFWS wants native grasslands restored because of the impact a change in vegetation may have to the listed species. The seed mix should be the same as in the surrounding land area, because if it is a different seed mix then it would be a permanent impact. Most land owners will want continuity for their pastures, and will want to keep what they have now. Keystone needs to restore the construction ROW consistent with the surrounding vegetation. Native seeds of local ecotype consistent with what is presently on the property crossed need to comprise the seed mix.
	USFWS developed a temporal modifier of 6 years (12 percent of permanent impact = 6/50 year Project life), including the year of impact and 5 additional years for revegetation, to adjust for the temporary nature of the pipeline construction disturbance in restored areas. The challenge is that 6 years after the project is completed, a different mix of species may develop which differs from the original and surrounding cover and the USFWS will need to determine if this affects the ABB. However, Keystone maintained that restoration for most locations would be complete within 4 years; and USFWS agreed to a 4 year monitoring window (including the year of construction).
	Financing issues for monitoring – possibilities for financing monitoring include either a restoration fund or possibly bonding; Keystone could take on monitoring with USFWS approval of the monitoring plan, or there could be a monitoring fund established so that USFWS completes the monitoring. Keystone could control expenses for monitoring if it undertakes its own plan; however, if monitoring is completed by the USFWS, then Keystone would only need to set-up a fund.
	USFWS would like to see a restoration fund established to cover the risk that vegetation

	Minutes
ltem	Focus/Outcomes
	restoration fails – Assurance for funds in year 4 for a second vegetation restoration, in case first habitat vegetation restoration is unsuccessful. Failure rate is typically about 10% for native vegetation (e.g., prairie grass). Vegetation in disturbed areas will be restored to original vegetation (consistent with vegetation on either side of the construction ROW). If restoration fails, in part or entirely, funds could be available to cover cost of a second restoration. Keystone could choose how funds would be set aside, options could include bond, escrow, other.
	Mike George – Would like to see a 4 year monitoring plan, and then a contingency plan that would continue for another period if there was failure to re-establish appropriate habitat along the ROW. Success of restoration would be measured by having vegetation with the same composition of native species and/or composition that is consistent on the ROW as compared to off the ROW (to allow for when native species are not originally present). Mike George is comfortable with the restoration and comfortable with using a 4-year period for monitoring. This period is defensible because native plants need 2 years to establish roots and 1 year to show. This needs to be an aggressive plan; success is determined by the mixture of native plants or having the same composition of plants both on and off-ROW. Failure would be when composition to re-establish consistent with adjacent undisturbed areas would result in designation of a permanent ABB habitat impact and the conservation funds would be augmented accordingly.
	Keystone will prepare a monitoring and restoration plan to start negotiations on details of plan. The monitoring and restoration plan would include comparison of on-ROW to off-ROW vegetation.
	Take Issues in Nebraska
	Nebraska Law does not allow for incidental take, and certain regions, including the Sand Hills area, are of great concern from the standpoint of habitat conservation. There are various mitigation measures that can avoid or minimize ABB take. At some interval before construction begins, mitigation measures along the ROW will begin, including trap and relocate, mowing and clearing vegetation, and the removal of carcasses.
	In June, it is critical to keep beetles out of the construction zone because that is when beetles are burying carcasses and reproducing. During the month of June minimizing measures may be performed more than once a week in high traffic sites. Also, Keystone may need to remove carrion every other day.
	Keystone will supply ABB take mitigation plan and vegetation restoration plan to NE Game and Parks Commission for further discussion on this issue.
	Discussion of Additional Identified Impacts in OK:
	<i>Heat Dissipation Impacts on the ABB During the Summer in OK</i> USFWS presented a new analysis of pipeline heat dissipation in Oklahoma and concluded

	Minutes
ltem	Focus/Outcomes
	there may be permanent habitat impacts from heat dissipating from the pipeline during summer months in Oklahoma. Temperatures increase up to 9.2° F relative to background out to 3 feet on either side of the pipeline, which is a 7 foot sub corridor, and that at 12 inches deep these increases could be enough to cause stress impacts on the ABB and affect reproduction.
	Dr. Hoback – there is no study that has specifically looked at how different temperatures affect the breeding of the ABB. A zoo breeding program for ABB shows that lowering temperatures by about 7°F encourages greater reproduction in captivity, but this was not peer reviewed or published. Also, the ABB have an ability to move a carcass depending upon where they find the carcass; a related species has been shown to move a carcass through the soil quite a ways horizontally. This enables the ABB to move away from thermal impact areas.
	Mike George – The information available is too nebulous to support in court; the scientific data are just not there to suggest that this is a permanent impact, therefore, Mike George is not willing to support this as a permanent impact. This impact will be removed from the mitigation plan.
	<i>Forest Impacts in OK</i> In OK, some ABB occur in forested and savannah habitats. The pipeline crosses through areas with trees in OK, and no agreed-upon determination has been made whether this is a temporary or permanent impact to the ABB. Even if the trees re-establish within the construction corridor, re-establishment of forested habitats would be long-term and loss of forest would be considered by USFWS a permanent impact.
	Some trees benefit the ABB, while other trees may be harmful to the ABB. The ABB is a habitat generalist and a carrion specialist. Removing trees may result in habitat fragmentation and edge effects. The ABB occurs in 6 states currently (formerly 32 states); fragmentation occurs through development of transportation corridors, alteration of land cover that results in changes in vegetation such as conversion to agriculture or subdivisions, as well as other developments. Converting sections of contiguous forest into smaller forest fragments separated by grassland may have an adverse impact on the ABB.
	Need to check all charts to make sure nothing is double-counted; thermal impacts are not included in the OK assessment, so the remaining temporary impacts would be the values in the BA minus the trees, as presented in the USFWS distributed spreadsheet. Using the process of adjusting the temporary impacts using a temporal modifier (2-3 years plus impact) resulted in a reduction to 8% of the permanent impact.
	Keystone does not recognize an issue with removal of trees as an impact to ABB habitat in OK. For 90 percent of the proposed Project ROW the Keystone pipeline would parallel existing ROWs, and there do not appear to be any large contiguous undisturbed native forest areas along the route in OK. The Keystone XL pipeline would parallel the MarkWest project which did not require mitigation for ABB impacts.
	Mike George – Keystone will check on the route of the pipeline in relation to tree cover and existing pipelines, utility and transportation corridors to consider possible affects related to trees in OK, and needs to determine if removal of trees has no effect or some effect that should

	Minutes
ltem	Focus/Outcomes
	be mitigated; this decision should be supported with the best available science. Keystone will review this issue and will work on identifying blocks of forested habitats, and then use the ABB habitat rating within the block, according to subjective analysis. This analysis should be completed for the southernmost 4 counties in OK: Bryan, Cole, Atoka, and Hughes. Keystone can complete the assessment on the blocks of trees and make a determination. This is the only area where habitat fragmentation could potentially affect the ABB.
	Access Roads and Mitigation Plan for ABB
	Before construction, trap and relocate mitigation measures will be carried out by Dr. Hoback along the pipeline where ABBs are located. There are significant portions of the Project route through ABB habitats that are not accessible from roads. For trap and relocate activities, traps need to be accessed every morning and ABB should be transported to release locations and released prior to noon that day. Dr. Hoback will consult with NGPC to determine alternative access points and methods to reach ABB habitats for trap and relocate activities. An alternative mitigation measure for use in remote areas could be to use "bait-away" to attract ABB away from the construction area. Bait-away would not require daily access to remote locations. Keystone will investigate alternative methods to minimize impacts to ABB in remote areas where trap and relocate access may not be practicable and will include recommendations in their mitigation plan.
	 Next steps for ABB Keystone and Dr. Hoback will develop language for the BA regarding the methods of minimizing ABB take. The NE Game and Parks Commission need to have evidence and documentation that they have done their job to ensure that the Project does not jeopardize the ABB in the state. The mitigation plan needs to go through a new council and Commissioners' approval before signature from NE Game and Parks Commission. So, it is very early in the state's process, and a change in NE legislation to provide for incidental take will likely not occur prior to construction of the Keystone XL pipeline
	Western Prairie Fringed Orchid Discussion
	Keystone identified potential suitable western prairie fringed orchid (WPFO) habitat areas and has surveyed the areas with access; surveys found a single plant. Keystone has rerouted the pipeline around the wetland containing this plant. Keystone did not identify any other areas with WPFO, although 6 of the 18 areas in NE with potentially suitable habitat were inaccessible. Keystone will return to those locations this year and survey the areas that were inaccessible and those that had a potential to support WPFO or other endangered orchids. Because the WPFO is so difficult to identify when not in bloom, and because it does not bloom every year, the USFWS would like Keystone to include areas where WPFO were not previously discovered, but that contained suitable habitat as part of the endangered species survey for this year.

Minutes	
ltem	Focus/Outcomes
	If WPFO are identified within the Project area, then it would be best to mark and relocate (move) the plant away from any areas where disturbing activities may occur and to other suitable habitat (e.g., the same meadow or wetland). This mitigation measure also applies to the small white ladyslipper which is a NE state listed plant with similar habitat requirements and growth characteristics. Will also move ancillary plants along with the WPFO; will add marking and relocating plants to the conservation measures.
	Agreement for potential locations previously surveyed, it was determined where they would take off the top soil and restore the wetland using similar/same species to the contiguous habitat. The habitat mitigation requirements for the ABB would also apply to the WPFO; spots in wetlands are always restored back to the original; can't change hydrology, or plant composition. Keystone would be required to follow USACE wetland permit requirements for construction and restoration of wetlands which include stripping topsoil and allowing natural revegetation from the native seed bank, re-seeding wetlands would be contrary to permit stipulations. Wetland restoration monitoring would be based on comparison to adjacent undisturbed wetland areas following USACE permit requirements. USFWS would like to see completion of detailed baseline site descriptions prior to construction, with successful restoration based on the return of conditions included in the detailed site description or based on undisturbed areas immediately off the ROW.
Next Steps	 DOS – Finalize and submit Final BA USFWS – Development of Biological Opinion

Keystone XL Pipeline Project ESA Monitoring and Reclamation Bonding Thursday, April 21, 2011

Participants: **DOS:** Nicole Gibson, Keith Benes

Cardno ENTRIX (on behalf of DOS): Lynn Noel, Bill Stager, Joe Rubin TROW Engineering and Others (on behalf of Keystone): Jon Schmidt, Jim White, Mike Schmaltz

	Minutes
Item	Focus/Outcomes
Purpose	To discuss monitoring for ESA species habitats and reclamation bonding issues.
Topics	Monitoring issues
	• Keystone Issues with Monitoring:
	 Concerned with the unprecedented request for the USFWS to monitor during construction.
	 Extra disturbance, intrusive, dangerous to have extra on-site people during construction
	 Unsure USFWS has experts who would understand remediation during the construction process
	 Cover established after reclamation is the best determination of reclamation effectiveness, not the process to achieve reclamation during construction.
	 Keystone is required to complete monitoring regarding obligations to land owners, USACE and others.
	 There are multiple issues involved with post construction monitoring, and so having additional measures is duplicative due to the requirements of the USACE for the Clean Water Act, the PHMSA, and other state and federal permitting agencies.
	 The post-construction monitoring plan for Keystone is to walk the pipeline two to three times per year and make sure there are no erosion or vegetation reestablishment issues. Keystone would quantitatively evaluate vegetation cover, erosion, restoration, weed establishment. Keystone will implement remediation activities as soon as problems are discovered to mitigate any discoveries, and then a follow-up survey would be completed.
	 Keystone would accept USFWS accompanying their monitors during post-construction surveys; and would provide USFWS with post-construction monitoring reports.
	 Keystone is concerned about frequency and intensity of monitoring by USFWS.
	 The current version of the USFWS-DOS MOU includes Keystone

	Minutes
ltem	Focus/Outcomes
	funding a field biologist who will monitor 2 days per week for 4
	years
	• DOS Discussion
	 Need to get a clear idea about what information the USFWS wants from monitoring.
	 Also need to know specific goals for post-construction monitoring; what does USFWS want to do in the stead of DOS?
	 DOS is not interested in creating unnecessary and duplicative efforts that may slow down re-vegetation efforts.
	 DOS is also sensitive to this process, and the issue of the ABB and the Sand Hills. A process for ESA compliance monitoring needs to be established.
	 DOS does not have a mechanism to respond to post-construction ESA issues related to reclamation and would prefer to defer this authority to USFWS.
	Bonding issues
	• Keystone issues with bonding
	 Keystone has not found statutory authority for bonding requirements by the USFWS; the laws for the USFWS to request a bond are unclear when
	the agency does not own the land.
	precedent, and has consequences industry-wide
	 A bond may be subject to expansion
	• There is a question about when and under what conditions the money for the bond would be released
	 Keystone is required to restore the land to the landowner's satisfaction. If a bond is imposed on Keystone to ensure the habitat is restored as American burying beetle (ABB) habitat, this may be interpreted as a 'take' of the landowner property.
	 In FERC projects, the monitoring has been consistent to restore the property to the pre-construction habitat, and Keystone is concerned the USEWS may be asking for something different
	 DOS discussion
	 One of the benefits of having to address the reestablishment of habitat for ABB is that when DOS speaks to people about ESA issues, DOS will be able to relay that USFWS has oversight on this issue beyond the monitoring done by Keystone.
	• The way USFWS has explained the need for the bond is that the bond would be released to address ABB habitat loss due to reclamation failure after 4-years or returned if unused after 8 years.

	Minutes
Item	Focus/Outcomes
Action Items	• DOS will contact USFWS and discuss these issues separately, and then there will be a follow-up meeting with all parties.
	• Keystone will provide Keith Benes with the templates for the post-construction monitoring in Nebraska and Texas.

APPENDIX B

Construction Mitigation and Reclamation Plan (CMRP)

-Page intentionally left blank-



KEYSTONE XL PROJECT

CONSTRUCTION, MITIGATION, AND RECLAMATION PLAN

April 2012 Rev. 4

1.0 INTRODUCTION

2.0 GENERAL CONDITIONS

- 2.1 Training
- 2.2 Environmental Inspection
- 2.3 Advance Notice of Access to Property Prior to Construction
- 2.4 Other Notifications
- 2.5 Damages to Private Property
- 2.6 Appearance of Worksite
- 2.7 Access
- 2.8 Aboveground Facilities
- 2.9 Minimum Depth of Cover
- 2.10 Non-Hazardous Waste Disposal
- 2.11 Hazardous Wastes
- 2.12 Noise Control
- 2.13 Weed Control
- 2.14 Dust Control
- 2.15 Off Road Vehicle Control
- 2.16 Fire Prevention and Control
- 2.17 Road and Railroad Crossings
- 2.18 Adverse Weather
- 2.19 Cultural Resources

3.0 SPILL PREVENTION AND CONTAINMENT

- 3.1 Spill Prevention
 - 3.1.1 Staging Area
 - 3.1.2 Construction Right of Way
- 3.2 Contingency Plans
- 3.3 Equipment
- 3.4 Emergency Notification
- 3.5 Spill Containment and Countermeasures

4.0 UPLANDS (AGRICULTURAL, FOREST, PASTURE, RANGE AND GRASS LANDS)

- 4.1 Interference with Irrigation Systems
- 4.2 Clearing
- 4.3 Topsoil Removal and Storage
- 4.4 Grading
- 4.5 Temporary Erosion and Sediment Control
 - 4.5.1 General
 - 4.5.2 Sediment Barriers
 - 4.5.3 Trench Plugs
 - 4.5.4 Temporary Slope Breakers (Water Bars)
 - 4.5.5 Drainage Channels or Ditches
 - 4.5.6 Temporary Mulching
 - 4.5.7 Tackifier
- 4.6 Stringing

- 4.7 Trenching
 - 4.7.1 Trench Dewater/Well Points
- 4.8 Welding, Field Joint Coating, and Lowering In
- 4.9 Padding and Backfilling
- 4.10 Clean Up
- 4.11 Reclamation and Revegetation
 - 4.11.1 Relieving Compaction
 - 4.11.2 Rock Removal
 - 4.11.3 Soil Additives
 - 4.11.4 Seeding
 - 4.11.5 Permanent Erosion and Sediment Control
 - 4.11.6 Fences
 - 4.11.7 Farm Terraces
 - 4.11.8 Right-of-Way and Pipeline Markers
- 4.12 Pasture and Range Lands
- 4.13 Forested Lands
- 4.14 Residential and Commercial/Industrial Areas
 4.14.1 Residential and Commercial Areas
 4.14.2 Site Specific Plans
 4.14.2 Landowner Complaint Resolution Press
- 4.14.3 Landowner Complaint Resolution Procedure 4.15 Fragile Soil Clean Up and Reclamation/Revegetation
 - 4.15.1 General
 - 4.15.2 Right-of-Way Construction
 - 4.15.3 Right-of-Way Reclamation
 - 4.15.4 Post Construction
- 4.16 Operations and Maintenance

5.0 DRAIN TILE SYSTEMS

- 5.1 General
- 5.2 Identification and Classification of Drain Tile Systems
 - 5.2.1 Publicly Owned Drain Tiles
 - 5.2.2 Privately Owned Drain Tiles
- 5.3 Mitigation of Damage to Drain Tile Systems
 - 5.3.1 Non-interference with Drain Tile
 - 5.3.2 Non-disturbance of Drain Tile Mains
 - 5.3.3 Relocation or Replacement of Existing Drain Tiles Prior to Construction
 - 5.3.4 Future Drain Tiles/Systems
 - 5.3.5 Other Mitigation Measures
- 5.4 Responsibility for Repair of Drain Tile Systems
 - 5.4.1 Local Drain Tile Contractor Repair
 - 5.4.2 Pipeline Contractor Repair
 - 5.4.3 Landowner/Tenant Repair
- 5.5 Drain Tile Repairs
 - 5.5.1 Temporary Repairs During Construction
 - 5.5.2 Permanent Repairs
- 5.6 Inspection/Acceptance of Drain Tile Repairs

6.0 WETLAND CROSSINGS

- 6.1 General
- 6.2 Easement and Workspace
- 6.3 Vehicle Access and Equipment Crossing
- 6.4 Temporary Erosion and Sediment Control
- 6.5 Wetland Crossing Procedures
 - 6.5.1 Dry Wetland Crossing Method
 - 6.5.2 Standard Wetland Crossing Method
 - 6.5.3 Flooded Push/Pull Wetland Crossing Method
- 6.6 Restoration and Reclamation

7.0 WATERBODIES AND RIPARIAN LANDS

- 7.1 General
- 7.2 Easement and Workspace
- 7.3 Vehicle Access and Equipment Crossings
- 7.4 Waterbody Crossing Methods
 - 7.4.1 Non-flowing Open Cut Crossing Method
 - 7.4.2 Flowing Open Cut Crossing Method of Minor, Intermediate, and Major Waterbodies
 - 7.4.3 Flowing Stream Crossing Dry Flume Method
 - 7.4.4 Flowing Stream Crossing Dry Dam and Pump Method
 - 7.4.5 Horizontal Directional Drill Crossings
 - 7.4.6 Horizontal Bore Crossings
- 7.5 Clearing
- 7.6 Grading
- 7.7 Temporary Erosion and Sediment Control
- 7.8 Trenching
- 7.9 Pipe Installation
- 7.10 Backfilling
- 7.11 Stabilization and Restoration of Stream Banks and Slopes

8.0 HYDROSTATIC TESTING

- 8.1 Testing Equipment Location
- 8.2 Test Water Source and Discharge Locations
- 8.3 Filling the Pipeline
- 8.4 Dewatering the Pipeline
 - 8.4.1 Splash Pup
 - 8.4.2 Splash Plate
 - 8.4.3 Plastic Liner
 - 8.4.4 Straw Bale Dewatering Structure

9.0 DRAWINGS AND FIGURES

Detail 1	Typical Silt Fence Barrier
----------	----------------------------

- Detail 2 Typical Straw or Hay Bale Barrier
- Detail 3 Temporary/Permanent Slope Breaker Detail (Water Bars)
- Detail 4 Erosion Control Matting Installation
- Detail 5 Typical Dewatering Filter Bag
- Detail 6 Typical Straw Bale Dewatering Structure
- Detail 7 Typical Permanent Trench Breaker
- Detail 8 "Dry" Wetland Crossing Method
- Detail 9 Standard Wetland Crossing Method
- Detail 10 Push/Pull Wetland Crossing Method
- Detail 11 Typical Open Cut Wet Crossing Method Non-Flowing Waterbody
- Detail 12 Typical Open Cut Wet Crossing Method Flowing Waterbody
- Detail 13 Typical Dry Flume Crossing Method
- Detail 13a Typical Dry Flume Crossing Method (Procedures)
- Detail 14 Typical Dam and Pump Crossing
- Detail 14a Typical Dam and Pump Crossing (Procedures)
- Detail 15 Typical Horizontal Drill (HDD) Site Plan & Profile
- Detail 16 Typical Temporary Bridge Crossing
- Detail 17 Typical Flume Bridge Crossing
- Detail 18 Typical Railcar Bridge Crossing
- Detail 19 Flexible Channel Liner Installation
- Detail 20 Typical Rock Rip-Rap
- Detail 21 Typical Uncased/Railroad Crossing Bore Detail
- Deail 22 (Omitted)
- Detail 23 Streambank Reclamation Log Wall
- Detail 24 Streambank Reclamation Vegetated Geotextile Installation
- Detail 25 Typical ROW Layout/Soil Handling 110' Construction ROW 50' Easement Drain Tile Crossing
- Detail 26 Header/Main Crossovers of Pipeline
- Detail 27 Relocate/Replace Drainage Header/Main
- Detail 28 Drainage and Irrigation Temporary Drain Tile Repair
- Detail 29 Drainage and Irrigation Permanent Drain Tile Repair
- Detail 30 Equipment Cleaning Station Detail
- Detail 31 Equipment Wash Station Detail
- Detail 67/67A Topsoil Conservation—Triple Ditch

1.0 INTRODUCTION

The construction, mitigation, and reclamation requirements described in this Plan apply to work on all of TransCanada Keystone Pipeline, L.P.'s (Keystone's) Keystone XL Project (Project) lands, including the following;

- uplands, including agricultural (cultivated or capable of being cultivated) lands, pasture lands; range lands; grass lands; forested lands; lands in residential, commercial, or industrial areas; lands in public rights of way; and lands in private rights-of-way;
- wetlands; and
- waterbodies and riparian areas.

Keystone, during the construction, operation, and maintenance of the Project, shall implement the construction, mitigation, and reclamation actions contained in this Plan to the extent that they do not conflict with the requirements of any applicable federal, state, or local rules and regulations, or other permits or approvals that are applicable to the Project. Additionally, Keystone may deviate from specific requirements of this Plan on specific private lands as agreed to by landowners or as required to suit actual site conditions as determined and directed by Keystone. All work must be in compliance with federal, state, and local permits.

The Project will be designed, constructed, operated and maintained in a manner that meets or exceeds applicable industry standards and regulatory requirements. Keystone's Integrity Management Plan and Emergency Response Plan outlines the preventative maintenance, inspection, line patrol, leak detection systems, SCADA, and other pipeline integrity management procedures to be implemented during operation of the Project.

2.0 GENERAL CONDITIONS

2.1 Training

Experienced, well-trained personnel are essential for the successful implementation of this Plan. Keystone and its Contractors shall undergo prevention and response, as well as safety training. The program shall be designed to improve awareness of safety requirements, pollution control laws and procedures, and proper operation and maintenance of equipment.

The construction contractor (Contractor), and all of his subcontractors shall ensure that persons engaged in Project construction are informed of the construction issues and concerns and that they attend and receive training regarding these requirements as well as all laws, rules and regulations applicable to the work. Prior to construction, all Project personnel will be trained on environmental permit requirements and environmental specifications, including fuel handling and storage, cultural resource protection methods, stream and wetland crossing requirements, and sensitive species protection measures. Different levels of training shall be required for different groups of Contractor personnel. Contractor supervisors, managers, field foremen, and other Contractor personnel designated by Keystone shall attend a comprehensive environmental training session. All other Contractor personnel shall attend a training session before the beginning of construction and during construction as environmental issues and incidents warrant. Additional training sessions shall be held for newly assigned personnel prior to commencing work on the Project.

All Contractor personnel shall attend the training session prior to entering the construction right-of-way. All Contractor personnel shall sign an acknowledgement of having attended the appropriate level of training and shall display a hard hat sticker that signifies attendance at environmental training. In order to ensure successful compliance, Contractor personnel shall attend repeat or supplemental training if compliance is not satisfactory or as new, significant new issues arise.

All visitors and any other personnel without specific work assignments shall be required to attend a safety and environmental awareness orientation.

2.2 Environmental Inspection

Keystone will use Environmental Inspectors on each construction spread. The Environmental Inspectors will review the Project activities daily for compliance with state, federal and local regulatory requirements. The Environmental Inspectors will have the authority to stop specific tasks as approved by the Chief Inspector. They can also order corrective action in the event that construction activities violate the provisions of this Plan, landowner requirements, or any applicable permit requirements.

2.3 Advance Notice of Access to Property Prior to Construction

Prior to initially accessing landowners' property, Keystone shall provide the landowner or tenant with a minimum of 24 hours prior notice unless otherwise negotiated with the landowner and as described in the Project line list). Additionally, the landowner or tenant shall be provided with Keystone contact information. Landowners may utilize contact information to inform Keystone of any concerns related to construction.

Prior notice shall consist of a personal contact, a telephone contact, or delivery of written notice to the landowner to inform the landowner of whereby the landowner or tenant is informed of Keystone's intent to initially access the land. The landowner or tenant need not acknowledge receipt of written notice before Keystone can enter the landowner's property.

Keystone will coordinate with managers of public lands to reduce conflicts between construction activities and recreational uses. Keystone will consult with land managers on state and federal lands regarding any necessary construction and maintenance restrictions consistent with management and use of such lands. Damages from disruption of recreational uses of private lands will be the subject of compensation negotiations with individual landowners. If pipeline activities occur during the winter season Keystone will consult with the appropriate regulatory agencies to establish the appropriate protective measures to avoid or mitigate wildlife seasonal, timing or migration concerns.

2.4 Other Notifications

The Contractor shall notify, in writing, both Keystone and the authority having jurisdiction over any road, railroad, canal, drainage ditch, river, foreign pipeline, or other utility to be crossed by the pipeline at least 48 hours (excluding Saturdays, Sundays, and statutory holidays), or as specified on the applicable permit(s), prior to commencement of pipeline construction, in order that the said authority may appoint an inspector to ensure that the crossing is constructed in a satisfactory manner.

The Contractor shall notify Keystone immediately of any spill of a potentially hazardous substance that creates a sheen on a wetland or waterbody, as well as any existing soil contamination discovered during construction.

The Contractor shall immediately notify Keystone of the discovery of previously unreported historic property, other significant cultural materials, or suspected human remains uncovered during pipeline construction.

The Contractor shall immediately notify Keystone of a Project-related injury to or mortality of a threatened or endangered animal.

2.5 Damages to Private Property

Pipeline construction activities shall be confined to the construction right-of-way, temporary work space, additional temporary work space, and approved access routes.

Keystone shall reasonably compensate landowners for any construction-related damages caused by Keystone which occur on or off of the established pipeline construction right-of-way.

Keystone shall reasonably compensate landowners for damages to private property caused by Keystone beyond the initial construction and reclamation of the pipeline, to include those damages caused by Keystone during future construction, operation, maintenance, and repairs relating to the pipeline.

2.6 Appearance of Worksite

The construction right-of-way shall be maintained in a clean, neat condition at all times. At no time shall litter be allowed to accumulate at any location on the construction right-of-way. The Contractor shall provide a daily garbage detail with each major construction crew to keep the construction right-of-way clear of trash, pipe banding and spacers, waste from coating products, welding rods, timber skids, defective materials and all construction and other debris immediately behind construction operations unless otherwise approved by Keystone. Paper from wrapping or coating products or lightweight items shall not be permitted to be scattered by the wind.

The traveled surfaces of roads, streets, highways, etc. (and railroads when applicable) shall be cleaned free of mud, dirt, or any debris deposited by equipment traversing these roads or exiting from the construction right-of-way.

2.7 Access

Prior to the pipeline's installation, Keystone and the landowner shall reach a mutually acceptable agreement on the route that shall be utilized by the Contractor for entering and exiting the pipeline construction right-of-way should access to the construction right-of-way not be practicable or feasible from adjacent segments of the pipeline construction right-of-way, public road, or railroad right-of-way.

All construction vehicles and equipment traffic shall be confined to the public roads, private roads acquired for use by Keystone, and the construction right-of-way. If temporary private access roads are constructed, they shall be designed to maintain proper drainage and shall be built to minimize soil erosion.

Sufficiently sized gaps shall be left in all spoil and topsoil wind rows and a hard or soft plug shall be left in the trench at all temporary private access roads and obvious livestock or wildlife trails unless the landowner agrees prior to construction that these access points can be blocked during construction.

All construction-related private roads and access points to the right-of-way shall be marked with signs. Any private roads not to be utilized during construction shall also be marked.

2.8 Aboveground Facilities

Locations for aboveground facilities shall be selected in a manner so as to be as unobtrusive as reasonably possible to ongoing agricultural or other landowner activities occurring on the lands adjacent to the facilities. If it is not feasible, to avoid interference, such activities shall be located so as to incur the least hindrance to the adjacent agricultural operations (i.e., located in field corners or areas where at least one side is not used for cropping purposes) provided the location is consistent with the design constraints of the pipeline. Aboveground facilities shall avoid floodplains and wetlands to the maximum extent possible. Additionally, they shall be located to avoid existing drain tile systems to the extent possible. To further reduce visual impacts from aboveground pipeline facilities and structures, Keystone will comply with standard industry painting practices with respect to aboveground facilities. Keystone will address any visual aesthetics issues with landowners in individual consultations.

2.9 Minimum Depth of Cover

The pipeline shall be installed so that the top of the pipe and coating is a minimum depth of 5 feet below the bottom of waterbodies including rivers, creeks, streams, ditches, and drains. This depth shall normally be maintained

over a distance of 15 feet on each side of the waterbody measured from the top of the defined stream channel. If concrete weights or concrete coated pipe is utilized for negative buoyancy of the pipeline, the minimum depth of cover shall be measured from the top of the concrete to the original ground contour. The following table indicates standard depths that would apply to pipeline construction.

	Normal Excavation	For Rock Excavation
Location	(inches)	(inches
Most areas	48	36
All waterbodies	60	36
Dry creeks, ditches, drains, washes, gullies, etc.	60	36
Drainage ditches at public roads and railroads	60	48

Depth of cover requirements may be modified by Keystone based on sitespecific conditions. However, all depths shall be in compliance with all established codes.

2.10 Non-Hazardous Waste Disposal

Non-hazardous pipeline construction wastes include human waste, trash, pipe banding and spacers, waste from coating products, welding rods, timber skids, cleared vegetation, stumps, and rock.

All waste which contains (or at any time contained) oil, grease, solvents, or other petroleum products falls within the scope of the oil and hazardous substances control, cleanup, and disposal procedures. This material shall be segregated for handling and disposal as hazardous wastes.

The Contractor shall be responsible for ensuring that human wastes are handled and disposed of exclusively by means of portable, self-contained toilets during all construction operations. Wastes from these units shall be collected by a licensed contractor for disposal only at licensed and approved facilities.

The Contractor shall remove all trash from the construction right-of-way on a daily basis unless otherwise approved or directed by Keystone.

The Contractor shall dispose of HDD drill cuttings and drilling mud at a Keystoneapproved location. Disposal options may include spreading over the construction right-of-way in an upland location approved by Keystone, or hauling to an approved licensed landfill or other site approved by Keystone.

The Contractor shall remove all extraneous vegetative, rock, and other natural debris from the construction right-of-way by the completion of cleanup

The Contractor shall remove all trash and wastes from Contractor yards, and Pipe Stockpipe Sites, and staging areas when work is completed at each location.
The Contractor shall dispose of all waste materials at licensed waste disposal facilities. Wastes shall not be disposed of in any other fashion such as unpermitted burying or burning.

2.11 Hazardous Wastes

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

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

All transporters of oil, hazardous substances, and hazardous wastes shall be licensed and certified according to the applicable state vehicle code. Incidents on public highways shall be reported to the appropriate agencies.

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

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

2.12 Noise Control

The Contractor shall minimize noise during non-daylight hours and within 1 mile of residences or other noise-sensitive areas such as hospitals, motels or campgrounds. Keystone shall abide by all applicable noise regulations regarding noise near residential and commercial/industrial areas. The Contractor shall provide notice to Keystone if noise levels are expected to exceed bylaws for a short duration. Keystone will give advanced notice to landowners within 500 feet of right-of-way prior to construction, limit the hours during which construction activities with high-decibel noise levels are conducted, coordinate work schedules, and ensure that construction proceeds quickly through such areas. The Contractor shall minimize noise in the immediate vicinity of herds of livestock or poultry operations, which are particularly sensitive to noise.

Keystone will set up a toll-free telephone line for landowners to report any construction noise-related issues.

6

2.13 Weed Control

Keystone will prepare a weed management plan for each state crossed by the project, as required. In general, these plans will consider the following measures listed below.

Prior to mobilization for the Project, the Contractor shall thoroughly clean all construction equipment, including timber mats, prior to moving the equipment to the job site to limit the potential for the spread of noxious weeds, insects and soil-borne pests. The Contractor shall clean the equipment with high-pressure washing equipment.

Prior to construction, Keystone will mark all areas of the right-of-way which contain infestations of noxious, invasive species or soil-borne pests. Such marking will clearly indicate the limits of the infestation along the right-of-way. During construction, the Contractor shall clean the tracks, tires, and blades of equipment by hand (track shovel) or compressed air to remove excess soil prior to movement of equipment out of weed or soil-borne pest infested areas, or utilize cleaning stations to remove vegetative materials using water under high pressure (see detail Drawings 30 and 31).

In areas of isolated weed populations, the Contractor shall strip topsoil from the full width of the construction right-of-way and store the topsoil separately from other topsoil and subsoil. The Environmental Inspectors will identify these locations in the field prior to grading activities.

The Contractor shall use mulch and straw or hay bales that are free of noxious weeds for temporary erosion and sediment control.

The Contractor shall implement pre-construction treatments such as mowing prior to seed development or herbicide application to areas of noxious weed infestation prior to other clearing, grading, trenching, or other soil disturbing work at locations identified in the construction drawings.

Keystone will implement Best Management Practices (BMPs) for conducting vegetation control where necessary before and after construction. Typical agricultural herbicides, developed in consultation with county or state regulatory agencies, will be used. Herbicide types will be determined based on the weed species requiring control. The Contractor shall apply herbicides, where required, within one week, or as deemed necessary for optimum mortality success, prior to disturbing the area by clearing, grading, trenching, or other soil disturbing work. Herbicides shall be applied by applicators appropriately licensed or certified by the state in which the work is conducted. All herbicides applied prior to construction shall be non-residual or shall have a significant residual effect no longer than 30 days. Herbicides applied during construction shall be non-residual. Keystone will implement BMPs in the use of pesticides and herbicides along the pipeline corridor to reduce potential impacts to avian and wildlife species.

The Contractor shall not use herbicides in or within 100 feet of a wetland or waterbody.

7

After pipeline construction, on any construction right-of-way over which Keystone will retain control over the surface use of the land after construction (i.e., valve sites, metering stations, pump stations, etc.), Keystone shall provide for weed control to limit the potential for the spread of weeds onto adjacent lands used for agricultural purposes. Any weed control spraying performed by Keystone shall be done by a state-licensed pesticide applicator.

Keystone shall be responsible for reimbursing all reasonable costs incurred by owners of land adjacent to aboveground facilities when the landowners must control weeds on their land which can be reasonably determined to have spread from land occupied by Keystone's aboveground facilities.

2.14 Dust Control

The Contractor shall at all-time control airborne dust levels during construction activities to levels acceptable to Keystone. The Contractor shall employ water trucks, sprinklers or calcium chloride as necessary to reduce dust to acceptable levels. Utilization of calcium chloride is limited to roads.

Dust shall be strictly controlled where the work approaches dwellings, farm buildings, and other areas occupied by people and when the pipeline parallels an existing road or highway. This shall also apply to access roads where dust raised by construction vehicles may irritate or inconvenience local residents. The speed of all Contractor vehicles shall be controlled in these areas. Emissions from construction equipment combustion, open burning, and temporary fuel transfer systems and associated tanks will be controlled to the extent required by state and local agencies through the permit process.

The Contractor shall take appropriate precautions to prevent fugitive emissions caused by sand blasting from reaching any residence or public building. The Contractor shall place curtains of suitable material, as necessary, to prevent wind-blown particles from sand blasting operations from reaching any residence or public building.

Additional measures may be required by state regulations or local ordinances. The Contractor will comply with all applicable state regulations and local ordinances with respect to truck transportation and fugitive dust emissions.

2.15 Off Road Vehicle Control

Keystone shall offer to landowners or managers of forested lands to install and maintain measures to control unauthorized vehicle access to the construction right-of-way where appropriate. These measures may include the following unless otherwise approved or directed by Keystone based on site specific conditions or circumstances:

- signs;
- fences with locking gates;
- slash and timber barriers, pipe barriers, or boulders lined across the

construction right-of-way; and

 conifers or other appropriate trees or shrubs across the construction right-ofway.

2.16 Fire Prevention and Control

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

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

2.17 Road and Railroad Crossings

Construction across paved roads, highways, and railroads will be in accordance with the requirements of the road and railroad crossing permits and approvals obtained by Keystone. In general, all major paved roads, all primary gravel roads, highways, and railroads will be crossed by boring beneath the road or railroad. Detail drawing 21 illustrates a typical bored road or railroad crossing. Boring requires the excavation of a pit on each side of the feature, the placement of boring equipment in the pit, and boring a hole under the road at least equal to the diameter of the pipe. For long crossings, sections can be welded onto the pipe string just before being pulled through the borehole. Boring will result in minimal or no disruption to traffic at road or railroad crossings. Each boring will be expected to take 1 to 2 days for most roads and railroads and up to 10 days for long crossings such as interstate or four-lane highways.

Most smaller, unpaved roads and driveways will be crossed using the open-cut method where permitted by local authorities or private owners. The open-cut method will require temporary closure of the road to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of traffic will be kept open, except during brief periods when it is essential to close the road to install the pipeline. Most open-cut road crossings can be finished and the road resurfaced in 1 or 2 days. Keystone will take measures, such as posting signs at open-cut road crossings, to ensure safety and minimize traffic disruptions.

2.18 Adverse Weather

The Contractor shall restrict certain construction activities and work in cultivated agricultural areas in excessively wet soil conditions to minimize rutting and soil compaction. In determining when or where construction activities should be restricted or suspended during wet conditions, the Contractor shall consider the following factors:

- the extent that rutting may cause mixing of topsoil with subsoil layers or damage to tile drains;
- excessive buildup of mud on tires and cleats;
- excessive ponding of water at the soil surface; and
- the potential for excessive soil compaction.

The Contractor shall implement mitigative measures as directed by Keystone in order to minimize rutting and soil compaction in excessively wet soil conditions which may include:

- restricting work to areas on the spread where conditions allow;
- using low ground weight, wide-track equipment, or other low impact construction techniques;
- limiting work to areas that have adequately drained soils or have a cover of vegetation ,such as sod, crops or crop residues, sufficient to prevent mixing of topsoil with subsoil layers or damage to drain tiles; and

• installing geotextile material or construction mats in problem areas.

"Stop work" authority will be designated to the chief inspector but will be implemented when recommended by the Environmental Inspector.

2.19 Cultural Resources

Keystone intends to avoid cultural resources to the extent practicable by rerouting the pipeline corridor and related appurtenances, avoiding construction activities on properties listed in or eligible for listing in the National Register of Historic Places (NRHP), as well as boring or using HDD through culturally sterile soils.

The Contractor shall implement the measures outlined in any unanticipated discovery plan or any Programmatic Agreement that is adopted to minimize disturbance to cultural sites and shall take immediate action as outlined in the Programmatic Agreement if any unanticipated cultural discovery is encountered during construction.

The preferred treatment of any historical property or culturally significant site is avoidance. Where required, Keystone will monitor the construction spread using a cultural resource monitor working under the direction of a professional who meets the standards of the *Secretary of the Interior's Historic Preservation Professional Qualification Standards* (48 FR 44716, September 29, 1983).

Prior to commencing construction, Keystone also will provide an appropriate level of training to all construction personnel so that the requirements of any unanticipated discovery plan or Programmatic Agreement are understood and unanticipated discoveries quickly identified.

In the event an unanticipated cultural discovery is made, the Contractor will immediately halt all construction activities within a 100-foot radius, including traffic; notify the Keystone Environmental Inspector; and implement interim measures to protect the discovery from looting or vandalism. The appropriate federal, state, local, or tribal authorities will be notified of discovery within 48 hours of the initial find. Construction will not proceed within the 100-foot radius of discovery site until all mitigation measures defined in the Programmatic Agreement are concluded and Keystone receives approval from the appropriate agencies that construction may resume. No work or activity within the 100-foot buffer area may take place until approvals are communicated at the spread level by the lead Environmental Inspector.

3.0 SPILL PREVENTION AND CONTAINMENT

Spill prevention and containment applies to the use and management of hazardous materials on the construction right-of-way and all ancillary areas during construction. This includes the refueling or servicing of all equipment with diesel fuel, gasoline, lubricating oils, grease, and hydraulic and other fluids during normal upland applications and special applications within 100 feet of perennial streams or wetlands.

Keystone will prepare a project-specific Spill Prevention Containment and Countermeasure (SPCC) Plan. The Contractor shall provide additional information to complete the SPCC Plan for each construction spread, and shall provide site-specific data that meets the requirements of 40 CFR Part 112 for every location used for staging fuel or oil storage tanks and for every location used for bulk fuel or oil transfer. Each SPCC Plan will be prepared prior to introducing the subject fuel, oil, or hazardous material to the subject location.

3.1 Spill Prevention

3.1.1 Staging Areas

Staging areas (including Contractor yards and pipe stockpile sites) shall be set up for each construction spread. Bulk fuel and storage tanks will be placed only at Contractor yards. No bulk fuel and storage tanks will be placed in the construction ROW. Hazardous materials at staging areas shall be stored in compliance with federal and state laws. The following spill prevention measures shall be implemented by the Contractor:

- Contractor fuel trucks shall be loaded at existing bulk fuel dealerships or from bulk tanks set up for that purpose at the staging area. In the former case, the bulk dealer is responsible for preventing and controlling spills.
- The Environmental Inspector shall inspect the tank site for compliance with the 100-foot setback requirement and approve the tank site prior to installing bulk fuel or storage tanks on the construction yard.
- Fuels and lubricants shall be stored only at designated staging areas. Storage of fuel and lubricants in the staging area shall be at least 100 feet away from the water's edge. Refueling and lubrication of equipment shall be restricted to upland areas at least 100 feet away from streams and wetlands.
- Contractors shall be required to perform all routine equipment maintenance at the staging area and recover and dispose of wastes in an appropriate manner.
- Fixed fuel dispensing locations will be provided with secondary containment to capture fuel from leaks, drips, and overfills.
- Temporary liners, berms, or dikes (secondary containment) shall be constructed around the aboveground bulk tanks, providing 110 percent containment volume of the largest storage tank or trailer within the containment structure, so that potential spill materials shall be contained and collected in specified areas. Tanks shall not be placed in areas subject to periodic flooding or washout.
- Drivers of tank trucks are responsible for safety and spill prevention during tank truck unloading. Procedures for loading and unloading tank trucks shall meet the minimum requirements established by the Department of Transportation.

- Drivers of tank trucks are responsible for setting brakes and chocking wheels prior to off loading. Warning signs requiring drivers to set brakes and chock wheels shall be displayed at all tanks. Proper grounding of equipment shall be undertaken during fuel transfer operations. Drivers shall observe and control the fueling operations at all times to prevent overfilling the temporary tank.
- Prior to departure of any tank truck, all vehicle outlets shall be examined closely by the driver for leakage, tightened, adjusted or replaced to prevent leakage while in transit.
- A supply of sorbent and barrier materials sufficient to allow the rapid containment and recovery of spills shall be maintained at each construction staging area. Sorbent and barrier materials shall also be utilized to contain runoff from contaminated areas.
- Shovels and drums shall be kept at each of the individual staging areas. In the event that small quantities of soil become contaminated, shovels shall be utilized to collect the soil and the material shall be stored in 55-gallon drums. Large quantities of contaminated soil may be bio-remediated on site or disposed in an approved landfill, subject to government approval, or collected utilizing heavy equipment, and stored in drums or other suitable containers prior to disposal. Should contamination occur adjacent to staging areas as a result of runoff, shovels or heavy equipment shall be utilized to collect the contaminated material. Contaminated soil shall be disposed of in accordance with state and federal regulations.
- Temporary aboveground tanks shall be subject to visual inspection on a monthly basis and when the tank is refilled. Inspection records shall be maintained. Operators shall routinely keep tanks under close surveillance and potential leaks or spills shall be quickly detected.
- Visible fuel leaks shall be reported to the Contractors' designated representative and corrected as soon as conditions warrant. Keystone's designated representative shall be informed.
- Drain valves on temporary tanks shall be locked to prevent accidental or unauthorized discharges from the tank.
- Oil and other hazardous materials stored in 350-gallon totes, 55gallon drums, 5-gallon pails, smaller retail-size containers or other portable containers will be staged or stored in areas with a secondary temporary containment structure. Secondary containment structures may consist of temporary earthen berms with a chemical resistant liner, or a portable containment system constructed of steel, PVC, or other suitable material. The secondary containment structure will be capable of containing 110 percent of the volume of material stored in these areas.

Keystone may allow modification of the above specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits.

3.1.2 Construction Right-of-Way

The Contractor will ensure that all equipment is free of leaks prior to use on the Project and prior to entering or working in or near waterbodies or wetlands. Throughout construction, the Contractor will conduct regular maintenance and inspections of the equipment to reduce the potential for spills or leaks.

Rubber-tired vehicles (pickup trucks, buses) normally shall refuel at the construction staging areas or commercial gas stations. Tracked machinery (backhoes, bulldozers) shall be refueled and lubricated on the construction right-of-way. Equipment maintenance shall be conducted in staging areas when practical. When impractical, repairs to equipment can be made on the construction right-of-way when approved by Keystone's representative.

Each fuel truck that transports and dispenses fuel to construction equipment or Project vehicles along the construction ROW or within equipment staging and material areas shall carry an oil spill response kit and spill response equipment onboard at all times. In the event that response materials are depleted through use or their condition is deteriorated through age, the materials will be replenished prior to placing the fueling vehicle back into service.

The following preventive measures apply to refueling and lubricating activities on the construction right-of-way:

- Construction activities shall be conducted to allow for prompt and effective cleanup of spills of fuel and other hazardous materials. Each construction crew, including cleanup crews shall have on hand sufficient tools and material to stop leaks and supplies of absorbent and barrier materials to allow rapid containment and recovery of spilled materials. Crew members must know and follow the procedure for reporting spills.
- Refueling and lubricating of construction equipment shall be restricted to upland areas at least 100 feet away from streams and wetlands. Where this is not possible (e.g., trench dewatering pumps), the equipment shall be fueled by designated personnel with special training in refueling, spill containment, and cleanup. The Environmental Inspector shall ensure that signs are installed identifying restricted areas.
- No fuel, oil or hazardous material storage, staging, or transfer other than refueling will occur within 100 feet of any storm drain, drop inlet, or high consequence area (HCA).
- Spent oils, lubricants, filters, etc. shall be collected and disposed of at an approved location in accordance with state and federal regulations.
- Equipment shall not be washed in streams.
- Stationary equipment will be placed within a secondary containment if it will be operated or require refueling within 100 feet of a wetland or waterbody boundary.

Keystone may allow modification of the above specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits.

3.2 Contingency Plans

The Contractor shall develop emergency response procedures for all incidents (e.g., spills, leaks, fires) involving hazardous materials which could pose a threat to human health or the environment. The procedures shall address activities in all work areas, as well as during transport to and from the construction right-of-way and to any disposal or recycling facility.

3.3 Equipment

The Contractor shall retain emergency response equipment in all areas where hazardous materials are handled or stored. This equipment shall be readily available to respond to a hazardous material emergency. Such equipment shall include, but not be limited to, the following:

- first aid supplies;
- phone or communications radio;
- protective clothing (Tyvek suit, gloves, goggles, boots);
- hand-held fire equipment;
- absorbent material and storage containers;
- non-sparking bung wrench and shovel; and
- brooms and dust pan.

Hazardous material emergency equipment shall be carried in all mechanic and supervisor vehicles. This equipment shall include, at a minimum:

- first aid supplies;
- phone or communications radio;
- 2 sets of protective clothing (Tyvek suit, gloves, goggles, boots);
- 1 non-sparking shovel;
- 6 plastic garbage bags (20 gallon);
- 10 absorbent socks and spill pads;
- Hand-held fire extinguisher;
- barrier tape; and
- 2 orange reflector cones.

Fuel and service trucks shall carry a minimum of 20 pounds of suitable commercial sorbent material.

The Contractor shall inspect emergency equipment weekly, and service and maintain equipment regularly. Records shall be kept of all inspections and services.

3.4 Emergency Notification

Emergency notification procedures between the Contractor and Keystone shall be established in the planning stages of construction. A Keystone representative shall be identified to serve as contact in the event of a spill during construction activities. In the event of a spill meeting government reporting criteria, the Contractor immediately shall notify the Keystone representative who, in turn, shall notify the appropriate regulatory agencies.

Any material released into water that creates a sheen must be reported immediately to Keystone. The Contractor is required to notify Keystone immediately if there is any spill of oil, oil products, or hazardous materials that reaches a wetland or waterbody. Incidents on public highways shall be reported to Keystone and the appropriate agencies by Keystone.

If a spill occurs on navigable waters of the United States, Keystone shall notify the National Response Center (NRC) at 1-800-424-8802. For spills that occur on public lands, into surface waters, or into sensitive areas, the appropriate governmental agency's district office also shall be notified.

3.5 Spill Containment and Countermeasures

In the event of a spill of hazardous material, Contractor personnel shall:

- notify the appointed Keystone representative;
- identify the product hazards related to the spilled material and implement appropriate safety procedures, based on the nature of the hazard;
- control danger to the public and personnel at the site;
- implement spill contingency plans and mobilize appropriate resources and manpower;
- isolate or shutdown the source of the spill;
- block manholes or culverts to limit spill travel;
- initiate containment procedures to limit the spill to as small an area as possible to prevent damage to property or areas of environment concern (e.g., watercourses); and
- commence recovery of the spill and cleanup operations.

When notified of a spill, the Keystone representative shall immediately ensure that:

- Action is taken to control danger to the public and personnel at the site.
- Spill contingency plans are implemented and necessary equipment and manpower are mobilized.

- Measures are taken to isolate or shutdown the source of the spill.
- All resources necessary to contain, recover and clean up the spill are available.
- Any resources requested by the Contractor from Keystone are provided.
- The appropriate agencies are notified. For spills which occur on public lands, into surface waters or into sensitive areas, the appropriate federal or state managing office shall also be notified and involved in the incident.

For a land spill, berms shall be constructed with available equipment to physically contain the spill. Personnel entry and travel on contaminated soils shall be minimized. Sorbent materials shall be applied or, if necessary, heavily contaminated soils shall be removed to an approved facility. Contaminated sorbent materials and vegetation shall also be disposed of at an approved facility.

For a spill threatening a waterbody, berms or trenches shall be constructed to contain the spill prior to entry into the waterbody. Deployment of booms, skimmers, and sorbent materials shall be necessary if the spill reaches the water. The spilled product shall be recovered and the contaminated area shall be cleaned up in consultation with spill response specialists and appropriate government agencies.

4.0 UPLANDS (AGRICULTURAL, FOREST, PASTURE, RANGE AND GRASS LANDS)

4.1 Interference with Irrigation Systems

If existing irrigation systems (flood irrigation, ditch irrigation, pivot, wheel, or other type of spray irrigation systems), irrigation ditches, or sheet flow irrigation shall be impacted by the construction of the pipeline, the following mitigative measures shall be implemented unless otherwise approved or directed by Keystone:

- If it is feasible and mutually acceptable to Keystone and the landowner or landowner's designate, temporary measures shall be implemented to allow an irrigation system to continue to operate across land on which the pipeline is being constructed.
- If the pipeline or temporary work areas intersect an operational (or soon to be operational) pivot or other spray irrigation system, Keystone shall establish with the landowner or landowner's designate an acceptable amount of time the irrigation system may be out of service. If an irrigation system interruption results in crop damages, either on the pipeline construction right-of-way or off the construction right-of-way, the landowner shall be compensated reasonably for all such crop damages.
- If the pipeline or temporary work areas intersect an operational sheet flow irrigation system, Keystone shall establish with the landowner or landowner's designate an acceptable amount of time the irrigation system may be out of service. If an irrigation system interruption results in crop

damages, either on the pipeline construction right-of-way or off the construction right-of-way, the landowner shall be compensated reasonably for all such crop damages.

• Irrigation ditches that are active at the time of construction shall not be stopped or obstructed except for the length of time to install the pipeline beneath the ditch (typically, one day or less) unless otherwise approved or directed by Keystone.

4.2 Clearing

The objective of clearing is to provide a clear and unobstructed right-of-way for safe and efficient construction of the pipeline. The following mitigable measures shall be implemented:

- Construction traffic shall be restricted to the construction right-of-way, existing public roads, and approved private roads.
- Construction right-of-way boundaries including pre-approved temporary workspace shall be clearly staked to prevent disturbance to unauthorized areas.
- If crops are present, they shall be mowed or disced to ground level unless an agreement is made for the landowner to remove.
- Burning is prohibited on cultivated land.
- Construction right-of-way at timber shelterbelts in agricultural areas shall be reduced to the minimum necessary to construct the pipeline.

4.3 Topsoil Removal and Storage

The objective of topsoil handling is to maintain topsoil capability by conserving topsoil for future replacement and reclamation and to minimize the degradation of topsoil from compaction, rutting, loss of organic matter, or soil mixing so that successful reclamation of the right-of-way can occur. The following mitigative measures shall be implemented during topsoil removal and storage unless otherwise approved or directed by Keystone based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- In areas designated for topsoil segregation, the actual depth of the topsoil, to a maximum depth of 12 inches, will be stripped from:
 - The area excavated above the pipeline; or
 - The area above the pipeline plus the spoil storage; or
 - The area above the pipeline plus the working side; or
 - o Entire ROW

as required by applicable permit agreements with the landowner or as dictated by site-specific conditions.

- Stripped topsoil is to be stockpiled in a windrow along the edge of the rightof-way. The Contractor shall perform work in a manner to minimize the potential for subsoil and topsoil to be mixed.
- Under no circumstances shall the Contractor use topsoil to fill a low area.
- If required due to excessively windy conditions, topsoil piles shall be tackified using either water or a suitable tackifier (liquid mulch binder).
- Gaps in the rows of topsoil will be left in order to allow drainage and prevent ponding of water adjacent to or on the right-of-way.
- Topsoil shall not be utilized to construct ramps at road or waterbody crossings.
- In areas with defined saline or sodic soil concerns, a triple-ditch method will be used to segregate problem soils as indicated in Detail 67 and 67A.
- If frozen topsoil conditions are encountered during winter construction, specialized construction equipment (i.e. ripping, frozen topsoil cutter, road reclaimer, etc) may be required to adequately segregate and conserve topsoil resources.

4.4 Grading

The objective of grading is to develop a right-of-way that allows the safe passage of equipment and meets the bending limitations of the pipe. The following mitigative measures shall be implemented during grading unless otherwise approved or directed by Keystone based on site-specific conditions or circumstances. However, all work shall be conducted in accordance with applicable permits.

- All grading shall be undertaken with the understanding that original contours and drainage patterns shall be re-established to the extent practicable..
- Agricultural areas that have terraces shall be surveyed to establish preconstruction contours to be utilized for restoration of the terraces after construction.
- On steep slopes, or wherever erosion potential is high, temporary erosion control measures shall be implemented.
- Bar ditches adjacent to existing roadways to be crossed during construction shall be adequately ramped with grade or ditch spoil to prevent damage to the road shoulder and ditch.
- Where the construction surface remains inadequate to support equipment travel, timber mats, timber riprap, or other method shall be used to stabilize surface conditions.

The Contractor shall limit the interruption of the surface drain network in the vicinity of the right-of-way using the appropriate methods:

 providing gaps in the rows of subsoil and topsoil in order to prevent any accumulation of water on the land;

- preventing obstructions in furrows, furrow drains, and ditches;
- installing flumes and ramps in furrows, furrow drains, and ditches to facilitate water flow across the construction right-of-way and allow for construction equipment traffic; and
- installing flumes over the trench for any watercourse where flow is continuous during construction.

4.5 Temporary Erosion and Sediment Control

4.5.1 General

Temporary erosion and sediment control measures shall be installed immediately after initial disturbance of the soil, maintained throughout construction (on a daily basis), and reinstalled as necessary until replaced by permanent erosion control structures or restoration of the construction right-of-way is complete.

Specifications and configurations for erosion and sediment control measures may be modified by Keystone as necessary to suit actual site conditions. However, all work shall be conducted in accordance with applicable permits.

The Contractor shall inspect all temporary erosion control measures at least daily in areas of active construction or equipment operation, weekly in areas with no construction or equipment operation, and within 24 hours of each significant rainfall event of 0.5 inches or greater. The Contractor shall repair all ineffective temporary erosion control measures as expediently as practicable.

4.5.2 Sediment Barriers

Sediment barriers shall be constructed of silt fence, staked hay or straw bales, compacted earth (e.g., drivable berms across travel lanes), sand bags, or other appropriate materials.

The Contractor shall install sediment barriers in accordance with Details 1 and 2 or as otherwise approved or directed by Keystone. The Contractor is responsible for properly installing, maintaining, and replacing temporary and permanent erosion controls throughout construction and cleanup. In wetland or riparian zones, the Contractor will install sediment control structures along the construction right-of-way edges prior to vegetation removal where practicable. The aforementioned sediment barriers may be used interchangeably or together depending on site-specific conditions. In most cases, silt fence shall be utilized where longer sediment barriers are required.

Sediment barriers shall be installed below disturbed areas where there is hazard of offsite sedimentation. These areas include:

• the base of slopes adjacent to road crossings;

- the edge of the construction right-of-way adjacent to and upgradient of a roadway, flowing stream, spring, wetland, or impoundment;
- trench or test water discharge locations where required;
- where waterbodies or wetlands are adjacent to the construction rightof-way; (the Contractor shall install sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way)
- across the entire construction right-of-way at flowing waterbody crossings;
- right-of-way immediately upslope of the wetland boundary at all standard (saturated or standing water) wetland crossings as necessary to prevent sediment flow into the wetland; (Sediment control barriers are not required at "dry" wetlands.)
- along the edge of the construction right-of-way within standard (saturated or standing water) wetland boundaries as necessary to contain spoil and sediment within the construction right-of-way. Sediment control barriers are not required at "dry" wetlands (Detail 8).

Sediment barriers placed at the toe of a slope shall be set a sufficient distance from the toe of the slope, if possible, in order to increase ponding volume.

Sediment control barriers shall be placed so as not to hinder construction operations. If silt fence or straw bale sediment barriers (in lieu of drivable berms) are placed across the entire construction right-of-way at waterbodies, wetlands, or upslope of roads, a provision shall be made for temporary traffic flow through a gap for vehicles and equipment to pass within the structure. Immediately following each day's shutdown of construction activities, a row of straw bales or a section of silt fence shall be placed across the up gradient side of the gap with sufficient overlap at each end of the barrier gap to eliminate sediment bypass flow, followed by bales tightly fitted to fill the gap. Following completion of the equipment crossing, the gap shall be closed using silt fence or straw bale sediment barrier.

The Contractor shall maintain straw bale and silt fence sediment barriers by removing collected sediment and replacing damaged bales. Sediment shall be removed and placed where it shall not reenter the barrier when sediment loading is greater than 40 percent or if directed by Keystone. If straw bale filters cannot be cleaned out due to access problems, the Contractor shall place a new row of sediment barriers upslope.

The Contractor shall use mulch and straw bales that are free of noxious weeds. Mulch or straw bales that contain evidence of noxious weeds or other undesirable species shall be rejected by the Contractor.

The Contractor shall remove sediment barriers, except those needed for permanent erosion and sediment control, during cleanup of the construction right-of-way.

4.5.3 Trench Plugs

The Contractor shall use trench plugs at waterbody and wetland crossings at the direction of the Environmental Inspector to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. Trench plugs shall be of sufficient size to withstand upslope water pressure.

4.5.4 Temporary Slope Breakers (Water Bars)

The Contractor shall install temporary slope breakers on slopes greater than 5% on all disturbed lands at the following recommended spacing:

Spacing (feet)
300
200
100

The gradient of each slope breaker shall be 2 to 4 percent.

If so directed by the landowner, the Contractor may not install temporary slope breakers (water bars) in cultivated land.

Temporary slope breakers shall be constructed of soil, silt fence, staked straw bales, sand bags, or similar materials authorized by Keystone.

The Contractor shall direct the outfall of each temporary slope breaker to a stable, well-vegetated area or construct an energy-dissipating device at the end of the slope breaker and off the construction right-of-way as permitted in the landowner agreement as shown in Detail 3. The outfall of each temporary slope breaker shall be installed to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources.

Specifications and configurations for temporary slope breakers may be modified by Keystone as necessary to suit actual site conditions. However, all work shall be conducted in accordance with applicable permits.

4.5.5 Drainage Channels or Ditches

Drainage channels or ditches shall be used on a limited basis to provide drainage along the construction right-of-way and toe of cut slopes as well as to direct surface runoff across the construction right-of-way or away from disturbances and onto natural undisturbed ground. Channels or ditches shall be constructed by the Contractor during grading operations. Where there is inadequate vegetation at the channel or ditch outlet, sediment barriers, check berms, or other appropriate measures shall be used to control erosion.

4.5.6 Temporary Mulching and Cover Crops

Unless otherwise directed by Keystone, the Contractor shall apply temporary seed and/or mulch on disturbed construction work areas that have been inactive for one month or are expected to be inactive for a month or more. The Contractor shall not apply temporary mulch in cultivated areas unless specifically requested by the landowner or in areas particularly prone to erosion. The Contractor shall not apply mulch within wetland boundaries.

Temporary mulch of straw or equivalent applied on slopes shall be spread uniformly to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of straw or its equivalent. Mulch application on slopes within 100 feet of waterbodies and wetlands shall be increased to an approximate rate of 3 tons per acre.

All seed that is used as a temporary cover crop will be approved and/or provided by Keystone.

4.5.7 Tackifier

When wetting topsoil piles with water does not prevent wind erosion, the Contractor shall temporarily suspend topsoil handling operations and apply a tackifier to topsoil stockpiles at the rate recommended by the manufacturer. The type of Tackifier will be approved by Keystone.

Should construction traffic, cattle grazing, heavy rains, or other related construction activity disturb the tackified topsoil piles and create a potential for wind erosion, additional tackifier shall be applied by the Contractor.

4.6 Stringing

The objective of stringing is to place the line pipe along the construction right-ofway for bending and welding in an expedient and efficient manner.

The Contractor shall utilize one or more of the following mitigative measures as applicable and when necessary to reduce compaction on the working side of the right-of-way or as directed by Keystone. However, all work shall be conducted in accordance with applicable permits.

- prohibiting access by certain vehicles;
- using only machinery possessing low ground pressure (tracks or extra-wide tires);
- limiting access and thus minimizing the frequency of all vehicle traffic;
- digging ditches to improve surface drainage;

- using timber riprap, matting, or geotextile fabric overlain with soil; and
- stopping construction for a period of time.

4.7 Trenching

The objective of trenching is to provide a ditch of sufficient depth and width with a bottom to continuously support the pipeline. During trenching operations, the following mitigative measures shall be implemented unless otherwise approved or directed by Keystone based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Where required, subsoil shall be segregated from topsoil in separate, distinct rows with a separation that shall limit any admixing of topsoil and subsoil during handling.
- Triple ditch soil handling will be completed at sites identified by Keystone according to Detail 67 and 67A to prevent soil degradation.
- Gaps must be left in the spoil piles that coincide with breaks in the strung pipe to facilitate natural drainage patterns and to allow the passage of livestock or wildlife.
- Trenching operations shall be followed as closely as practicable by lower in and backfill operations to minimize the length of time the ditch is open.
- Construction debris (e.g., welding debris) and other garbage shall not be deposited in the ditch.
- If trenching, pipe installation and backfill operations take place during frozen soil conditions, final clean-`up (including additional trench compaction, subsoil feathering, final contouring and topsoil replacement) will be delayed until the subsoil and topsoil thaw completely the following spring/summer. A pronounced subsoil berm will be left over the trench line until final clean-up takes place to account for settlement of thawing backfill. Gaps will be left in the berm to maintain cross-ROW drainage

The Contractor shall prepare a blasting plan that is applicable to any locations where blasting will be necessary adjacent to existing high pressure pipelines, overhead or underground utilities, farm operations, or public crossings. The Contractor and its blasting supervisor shall be thoroughly familiar with and comply with the rules and regulations of Occupational Safety and Health Administration (OSHA) and all federal, state, county and local regulations governing blasting operations. Keystone will file the blasting along the ROW may uncover paleontological resources of scientific value. Keystone will consult with the appropriate regulatory agencies in each state on the applicability and requirements for Paleontological Resource Protection Plans. Keystone will prepare and file plans addressing vertebrate fossils with any respective states, as required.

Should blasting be necessary for removal of rock, the following mitigative measures may be implemented:

- The Contractor shall use non-electric initiation systems for all blasting operations. If required by the blasting plan, blasting will be monitored for vibration levels and peak particle velocity. This work shall be performed by a third-party vibration monitoring consultant hired by and reporting to the Constructor Representative. The Contractor shall arrange for detonations to be carried out in cooperation with this consultant.
- Prior to using explosives, the Contractor shall advise residents of the immediate area, in order to prevent any risk of accidents or undue disturbances.
- No blasting shall be done without approval of the Constructor Representative. Prior to any detonation of explosives in the vicinity of a loaded line, dwelling, structure, overhead or underground utility, farm operation, or public crossings, a minimum of 48 hour's notice shall be given to the Constructor Representative, in order that the appropriate people can be notified and the upstream and downstream mainline valves can be staffed.
- The Contractor shall obtain all necessary permits and shall comply with all legal requirements in connection with the use, storage, and transportation of explosives.
- Blasting mats or subsoil may be piled over the trench line to prevent rock from being blown outside the construction right-of-way.
- Each blasting location shall be cleared and cleaned up before and after all blasting operations.
- Blasting shall be carried out during regular, daylight working hours.
- The Contractor shall at all times protect his workers and the public from any injury or harm that might arise from drilling dust and the use of explosives.
- Only workers thoroughly experienced in handling explosives shall be permitted to supervise, handle, haul, load or shoot explosives. In those jurisdictions where the licensing of blasters is mandatory, the Contractor shall provide the Constructor Representative with proof of the required certification for every person so required.
- The drilling pattern shall be set in a manner to achieve smaller rock fragmentation (maximum 1 foot in diameter) in order to use as much as possible of the blasted rock as backfill material after the pipe has been padded in accordance with the specifications.
- Blasting testing of surface-water resources and water wells within 150 feet of the centerline will be performed in compliance with all applicable permits.
- 4.7.1 Trench Dewatering/Well Points

The Contractor shall make all reasonable efforts to discharge trench water in a manner that avoids damage to adjacent agricultural land, crops, and pasture. Damage includes, but is not limited to, the inundation of crops for more than 24 hours, deposition of sediment in ditches, and the deposition of gravel in fields or pastures. If trench dewatering is necessary in an area where salt damage to adjacent crops is evident, the Environmental Inspector shall conduct a field conductivity test on the trench water before it is discharged. If the conductivity of the trench water is determined to potentially affect soil quality, it shall not be discharged to areas where salt damage to crops is evident, but shall be directed as feasible so that water flows over a well vegetated, non-cropland area or through an energy dissipater and sediment barrier.

When pumping water from the trench for any reason, the Contractor shall ensure that adequate pumping capacity and sufficient hose is available to permit dewatering as follows:

- No heavily silt-laden trench water shall be allowed to enter a waterbody or wetland directly but shall instead be diverted through a well vegetated area, a geotextile filter bag, or a permeable berm (straw bale or Keystone approved equivalent).
- Trench water shall not be disposed of in a manner which could damage crops or interfere with the functioning of underground drainage systems.

The Contractor shall screen the intake hose and keep the hose either one foot off the bottom of the trench or in a container to minimize entrainment of sediment.

4.8 Welding, Field Joint Coating, and Lowering In

The objectives of welding, field joint coating, and lowering in are to provide continuous segments of pipeline, to provide corrosion protection to the weld areas of the pipeline, and to place the pipeline in the center of the trench, without stress, at the required depth of cover. The following mitigative measures shall be followed during pipe welding, field joint coating, and lowering in, unless otherwise specified by Keystone in response to site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Shavings produced during beveling of the line pipe are to be removed immediately following this operation to ensure that livestock and wildlife do not ingest this material. When welding operations create a continuous line of pipe that may be left in the right-of-way for an extended period of time due to construction or weather constraints, a gap in the welded pipe shall be provided to allow for access at farm road crossings and for passage of livestock and wildlife.
- Prior to the application of epoxy powder, urethane epoxy, or other approved pipe coatings, a tarp shall be placed underneath the pipe in wetlands to collect any overspray of epoxy powder and liquid drippings. Excess powder, liquid, or other hazardous materials (e.g. brushes, rollers, gloves) shall be continuously collected and removed from the construction right-of-way and disposed of in a manner appropriate for these materials.

4.9 Padding and Backfilling

The objective of padding and backfilling is to cover the pipe with material that is not detrimental to the pipeline and pipeline coating. The following mitigative measures shall be utilized during backfilling, unless otherwise approved or directed by Keystone based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Excessive water accumulated in the trench shall be eliminated prior to backfilling.
- In the event it becomes necessary to pump water from open trenches, the Contractor shall pump the water and discharge it in accordance with the requirements of the Stormwater Pollution Prevention Plan (SWPPP) in order to avoid damaging adjacent areas. Detail 5 and Detail 6 provide typical examples of dewatering structures.
- If it is impossible to avoid water-related damages (including inundation of crops for more than 24 hours, deposition of sediment in ditches and other water courses, and the deposition of gravel in fields, pastures, and any water courses), Keystone shall reasonably compensate the landowners for the damage and/or shall correct the damage so as to restore the land, crops, pasture, water courses, etc. to their pre-construction condition.
- All pumping of water shall comply with existing drainage laws and local ordinances relating to such activities and provisions of the Clean Water Act.
- Prior to backfilling, all drain tile shall be permanently repaired, inspected, and the repair documented as described in Section 5.5.
- Prior to backfilling, trench breakers shall be installed on slopes where necessary to minimize the potential for water movement down the ditch and potential subsequent erosion.
- During backfill, the stockpiled subsoil shall be placed back into the trench before replacing the topsoil.
- Topsoil shall not be utilized for padding the pipe.
- Backfill shall be compacted to a minimum of 90% of pre-existing conditions where the trench line crosses tracks of wheel irrigation systems (pivots).
- To reduce the potential for ditch line subsidence, spoil shall be replaced and compacted by backhoe bucket or by the wheels or tracks of equipment traversing down the trench.
- The lesser of 4 feet or the actual depth of topsoil cover, shall not be backfilled with soil containing rocks of any greater concentration or size than existed prior to pipeline construction in the pipeline trench, bore pits, or other excavations.

4.10 Cleanup

The objective of cleanup activities shall be to prepare the right-of-way and other disturbed areas to approximate pre-activity ground contours where appropriate and to replace spoil and stockpiled material in a manner which preserves soil

capability and quality to a degree reasonably equivalent to the original or that of representative undisturbed land. The following mitigative measures shall be utilized during cleanup, unless otherwise approved or directed by Keystone based on specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Cleanup shall occur immediately following backfilling operations when weather or seasonal conditions allow.
- All garbage and construction debris (e.g., lathing, ribbon, welding rods, pipe bevel shavings, pipe spacer ropes, end caps, pipe skids) shall be collected and disposed of at approved disposal sites.
- The right-of-way shall be re-contoured with spoil material to approximate pre-construction contours and as necessary to limit erosion and subsidence. Loading of slopes with unconsolidated spoil material shall be avoided during slope re-contouring. Topsoil shall be replaced after re-contouring of the grade with subsoil. The topsoil shall be replaced on the subsoil storage area and over the trench so that after settling occurs, the topsoil's approximate original depth and contour (with an allowance for settling) shall be achieved.
- Where topsoil has been segregated, subsoil shall not be permanently placed on top of topsoil.
- Surface drainage shall be restored and re-contoured to conform to the adjacent land drainage system.
- Erosion control structures such as permanent slope breakers and cross ditches shall be installed on steep slopes where necessary to control erosion by diverting surface run-off from the right-of-way to stable and vegetated off right-of-way areas.
- During cleanup, temporary sediment barriers such as silt fence and hay bale diversions will be removed; accumulated sediment will re-contoured with the rest of the ROW; and permanent erosion controls will be installed as necessary.
- After construction, all temporary access shall be returned to prior construction conditions unless specifically agreed with the landowner or otherwise specified by Keystone.
- Warning signs, aerial markers, and cathodic protection test leads shall be installed in locations in compliance with U.S. Federal code and in locations that shall not impair farming operations where practicable.
- All bridges, fences and culverts existing prior to construction shall be restored to meet or exceed approximate pre-construction conditions. Caution shall be utilized when re-establishing culverts to ensure that drainage is not improved to a point that would be detrimental to existing waterbodies and wetlands.
- All temporary gates installed during construction shall be replaced with permanent fence unless otherwise requested by the landowner.

4.11 Reclamation and Revegetation

The objectives of reclamation and revegetation are to return the disturbed areas to approximately pre-construction use and capability. This involves the treatment of soil as necessary to preserve approximate pre-construction capability and the stabilization of the work surface in a manner consistent with the initial land use.

The following mitigative measures will be utilized unless otherwise approved or directed by Keystone based on site specific conditions or circumstances. However, all work shall be conducted in accordance with applicable permits.

4.11.1 Relieving Compaction

Compaction will typically be relieved in subsoils that have received substantial construction traffic, as determined by Keystone, prior to replacing and respreading topsoil. Compaction will typically not be relieved in topsoils that have been left in place and that have not been driven on. Any rock that is brought to the surface during decompaction activities will be removed until the quantity, size, and distribution of rock is equivalent to that found on adjacent land as determined by the Environmental Inspector. Compaction will typically be relieved as follows:

- Compacted cropland compacted shall be ripped a minimum of 3 passes at least 18 inches deep and all pasture shall be ripped or chiseled a minimum of three passes at least 12 inches deep before replacing topsoil.
- Areas of the construction right-of-way that were stripped for topsoil salvage shall be ripped a minimum of 3 passes (in cross patterns, as practical) prior to topsoil replacement. The approximate depth of ripping shall be 18 inches (or a lesser depth if damage may occur to existing drain tile systems). After ripping, the subsoil surface shall be graded smooth and any subsoil clumps broken up (disc and harrow) in an effort to avoid topsoil mixing.
- The de-compacted construction right-of-way shall be tested by the Contractor at regular intervals for compaction in agricultural and residential areas. Tests shall be conducted on the same soil type under similar moisture conditions in undisturbed areas immediately adjacent to the right-of-way to approximate pre-construction conditions. Penetrometers or other appropriate devices shall be used to conduct tests
- Topsoil shall be replaced to pre-existing depths once ripping and discing of subsoil is complete up to a maximum of 12 inches. Topsoil compaction on cultivated fields shall be alleviated with cultivation methods by the contractor.
- If there is any dispute between the landowner and Keystone as to what areas need to be ripped or chiseled, the depth at which compacted areas should be ripped or chiseled, or the necessity or

rates of lime and fertilizer application, the appropriate NRCS shall be consulted by Keystone and the landowner.

Plowing under of organic matter including wood chips and manure, or planting of a green crop such as alfalfa to decrease soil bulk density and improve soil structure or any other measures in consultation with the Natural Resource Conservation Service (NCRS) shall be considered if mechanical relief of compaction is deemed not satisfactory.

In the first year after construction, Keystone will inspect the ROW to identify areas of erosion or settling. Subsequently, Keystone will monitor erosion and settling through aerial patrols, which are part of Keystone's Integrity Management Plan, and through landowner reporting. Landowner reporting will be facilitated through use of Keystone's toll-free telephone number, which will be made available to all landowners on the ROW. Landowner reporting also may be facilitated through contact with Keystone's field offices.

Keystone plans to minimize impacts on soil productivity that may result from construction activities, but recognizes that some short- to long-term decreases in agricultural productivity are possible. Keystone recognizes its responsibility to restore agricultural productivity on the pipeline ROW and to compensate landowners for demonstrated decreases in productivity that may result from any degradation of agricultural soils along the ROW.

4.11.2 Rock Removal

- Rocks that are exposed on the surface due to construction activity shall be removed from the right-of-way prior to and after topsoil replacement. This effort will result in an equivalent quantity, size and distribution of rocks to that found on adjacent lands, as determined by the Environmental Inspectors.
- Clearing of rocks may be carried out with a mechanical rock picker or by manual means, provided that preservation of topsoil is assured. Rock removed from the right-of-way shall be hauled off the landowner's premises or disposed of on the landowner's premises at a location that is mutually acceptable to the landowner and to Keystone.

4.11.3 Soil Additives

If site-specific conditions warrant and if agreed to by the landowner, the Contractor shall apply amendments (fertilizer and soil pH modifier materials and formulations) commonly used for agricultural soils in the area and in accordance with written recommendations from the local soil conservation authority, land management agencies, or landowner. Amendments shall be incorporated into the normal plow layer as soon as possible after application.

4.11.4 Seeding

- The final seed mix shall be based on input from the local Natural Resource Conservation Service and the availability of seed at the time of reclamation. The landowner may request specific seeding requirements during easement negotiations.
- Certificates of seed analysis are required for all seed mixes to limit the introduction of noxious weeds.
- Seed not utilized within 12 months of seed testing shall be approved by Keystone prior to use. Seeding shall follow cleanup and topsoil replacement as closely as possible. Seed shall be applied to all disturbed surfaces (except cultivated fields unless requested by the landowner) as indicated on the construction drawings
- If mulch was applied prior to seeding for temporary erosion control, the Contractor shall remove and dispose of the excess mulch prior to seedbed preparation to ensure that seedbed preparation equipment and seed drills do not become plugged with excess mulch; and to support an adequate seedbed; and to ensure that seed incorporation or soil packing equipment can operate without becoming plugged with mulch.
- Identified seeding areas shall be seeded as specified by Keystone. Seeding rates shall be based on pure live seed.
- Weather conditions, construction right-of-way constraints, site access, topography and soil type shall influence the seeding method to be used (i.e., drill seeding versus broadcast seeding).
- The Contractor shall delay seeding as directed by Keystone until the soil is in the appropriate condition for seeding.
- The Contractor shall use a Truax brand or Keystone approved equivalent-type drill seeder equipped with a cultipacker designed and equipped to apply grass and grass-legume seed mixtures with mechanisms such as seed box agitators to allow even distribution of all species in each seed mix, with an adjustable metering mechanism to accurately deliver the specified seeding rate and with a mechanism such as depth bands to accurately place the seed at the specified depth.
- The Contractor shall operate drill seeders at an appropriate speed so the specified seeding rate and depth is maintained, as directed by Keystone.
- The Contractor shall calibrate drill seeders so that the specified seeding rate is planted. The row spacing on drill seeders shall not exceed 8 inches.
- The Contractor shall plant seed at depths consistent with the local or regional agricultural practices.

- Broadcast or hydro seeding, used in lieu of drilling, shall utilize NRCS-recommended seeding rates. Where seed is broadcast, the Contractor shall use a harrow, cultipacker, or other equipment immediately following broadcasting to incorporate the seed to the specified depth and to firm the seedbed.
- The Contractor shall delay broadcast seeding during high wind conditions if even distribution of seed is impeded.
- The Contractor shall hand rake all areas that are too steep or otherwise cannot be safely harrowed or cultipacked in order to incorporate the broadcast seed to the specified depth.
- Hydro seeding may be used, on a limited basis, where the slope is too steep or soil conditions do not warrant conventional seeding methods. Fertilizer, where specified, may be included in the seed, virgin wood fiber, tackifier, and water mixture. When hydro-seeding, virgin wood fiber shall be applied at the rate of approximately 3,000 pounds per acre on an air-dry weight basis as necessary to provide at least 75% ground cover. Tackifier shall consist of biodegradable, vegetable-based material and shall be applied at the rate recommended by the manufacturer. The seed, mulch, and tackifier slurry shall be applied so that it forms a uniform, mat-like covering of the ground.
- Keystone shall work with landowners to discourage intense livestock grazing of the construction right-of-way during the first growing season by utilization of temporary fencing or deferred grazing, or increased grazing rotation frequency.
- 4.11.5 Permanent Erosion and Sediment Control

The Contractor shall restore all existing landowner soil conservation improvements and structures disturbed by pipeline construction to the approximate pre-construction line and grade. Soil conservation improvements and structures include, but are not limited to, grassed waterways, toe walls, drop inlets, grade control works, terraces, levees, and farm ponds.

4.11.5.1 Trench Breakers

The Contractor shall install trench breakers in steep terrain where necessary to limit the potential for trench line erosion and at the base of slopes adjacent to waterbodies and wetlands.

Trench breakers shall be constructed of materials such as sand bags, sand/cement bags, bentonite bags, or other suitable materials by the Contractor (Detail 7). The Contractor shall not use topsoil in trench breakers.

4.11.5.2 Permanent Slope Breakers (Water Bars)

Permanent slope breakers (water bars) shall be constructed of soil or, in some instances, sand bags.

The Contractor shall construct permanent slope breakers on the construction right-of-way where necessary to limit erosion, except in cultivated and residential areas. Slope breakers shall divert surface runoff to adjacent stable vegetated areas or to energy-dissipating devices as shown on Detail 3. In general, permanent slope breakers should be installed immediately downslope of all trench breakers. Permanent slope breakers shall be installed as specified on the construction drawings or generally with a minimum spacing as shown on the following table:

Slope (%)	Spacing (feet)
5 - 15	300
>15 – 30	200
>30	100

The gradient (fall) for each slope breaker shall be two percent to four percent unless otherwise approved by Keystone based on site-specific conditions.

The Contractor shall construct slope breakers to divert surface flow to a stable, well-vegetated area. In the absence of a stable area, the Contractor shall construct appropriate energydissipating devices at the end of the slope breaker and beyond the area disturbed by construction.

4.11.5.3 Mulching

The Contractor shall apply mulch on all areas with high erosion potential and on slopes greater than 8 percent unless otherwise approved by Keystone based on site-specific conditions or circumstances. The Contractor shall spread mulch uniformly over the area to cover at least 75 percent of the ground surface at an approximate rate of 2 tons per acre of straw or its equivalent. The Environmental Inspector may reduce the application rate or forego mulching an area altogether if there is an adequate cover of rock or organic debris to protect the slope from erosion, or if annual companion crops have stabilized the soil.

Mulch application includes straw mulch, hydro mulch and tackifier or other materials as approved by Keystone.

The Contractor shall use mulch that is free of noxious weeds.

The Contractor shall apply mulch immediately following seeding. The Contractor shall not apply mulch in wetlands.

If a mulch blower is used, the majority of strands of the mulching material shall not be shredded to less than 8 inches in length to allow anchoring. The Contractor shall anchor mulch immediately after application to minimize loss by wind and water.

When anchoring (straw crimping) by mechanical means, the Contractor shall use a tool specifically designed for mulch anchoring with flat, notched disks to properly crimp the mulch to a depth of 2 to 3 inches. A regular farm disk shall not be used to crimp mulch. The crimping of mulch shall be performed across the slope of the ground, not parallel to it. In addition, in areas of steep terrain, tracked vehicles may be used as a means of crimping mulch (equipment running up and down the hill to leave crimps perpendicular to the slope), provided they leave adequate coverage of mulch.

In soils possessing high erosion potential, the Contractor may be required to make two passes with the mulch-crimping tool; passes must be as perpendicular to the others as possible.

When anchoring with liquid mulch binders (tackifiers), the Contractor shall use a biodegradable tackifier derived from a vegetable-based, organic source. The Contractor shall apply mulch binders at rates recommended by the manufacturer.

The Contractor shall limit the use of tackifiers for anchoring straw and the use of hydromulch and tackifier to areas that are too steep or rocky to safely or effectively operate mechanical mulch-anchoring tools. No asphalt-based tackifiers shall be used on the Project.

4.11.5.4 Erosion Control Matting

Erosion control matting shall be applied where shown on the construction drawings as shown on Detail 4. The Contractor shall anchor the erosion control matting with staples or other approved devices.

The Contractor shall use erosion control matting made of biodegradable, natural fiber such as straw or coir (coconut fiber).

The Contractor shall prepare the soil surface and install the erosion control matting to ensure it is stable and the matting makes uniform contact with the soil of the slope face or stream bank with no bridging of rills, gullies, or other low areas.

4.11.5.5 Riprap and Stream Bank Stabilization

Disturbed banks of streambeds and waterbodies shall be restored to their approximate original contours unless otherwise directed. Erosion protection shall be applied as specified in the construction drawings.

Most restored banks will be protected through the use of flexible channel liners installed as specified in Detail 19.

If the original stream bank is excessively steep and unstable and/or flow conditions are severe, a more stable final contour may be specified and alternate stabilization measures may be installed.

Alternate stabilization measures may consist of rock riprap, biostabilization, or engineered structures such as brush layering, logwalls, cribwalls, or vegetated geo-grids. See Details 20, 23, and 24.

Stream bank riprap structures shall consist of a layer of stone underlain with approved filter fabric or a gravel filter blanket. Riprap shall extend from the stabilized streambed to the top of the stream bank. Native rock shall be utilized wherever practicable.

4.11.6 Fences

Upon completion of all backfilling, cleanup, and restoration, including mulching and seeding of the construction right-of-way, permanent repairs shall be made to all fences by using either the original material or good quality new material similar to existing fences.

Historic fences shall be carefully reassembled by hand from the original material. Where the original material has deteriorated to a state that makes it unsalvageable, replacement material similar to the original shall be used if possible.

4.11.7 Farm Terraces

Keystone will work with landowners and farm service agencies to ensure restoration of farm terraces to their pre-construction function. Keystone may elect to negotiate a fair settlement with the landowner to employ a local land leveling contractor to restore the terrace.

Before any groundwork is performed in areas with farm terraces, Keystone will conduct a civil survey to document the location and contours of each terrace. Both the channel contour and the terrace berm will be surveyed within the construction right-of-way and up to 100 feet on either side of the ROW boundaries. The pre-construction survey will provide a baseline to ensure the proper restoration of the terrace following construction.

The Contractor will maintain the pre-disturbance drainage of water along the terrace channel and will install temporary flume pipe for this purpose. As necessary, temporary erosion control measures such as water bars and sediment barriers will be installed and maintained throughout construction to reduce the potential for soil erosion along or off the construction ROW.

Following installation of the pipe, the trench will be backfilled, and the Contractor will restore the terrace contours as agreed to with the landowner.

Should the landowner agree to have a local contractor restore the terraces, the Contractor will backfill the trench and restore the terrace using typical compaction methods for pipeline construction with the understanding that the landowner's contractor will re-excavate the location and re-install the terrace utilizing land levelling equipment and special compaction methods.

Should the landowner desire the Contractor to restore the terraces, the pipeline contractor will compact the trench before the terrace berm is replaced. Following restoration of the terraces, final contours and grades will be re-surveyed and documented with survey notes. Keystone will perform post-construction monitoring and inspection with the landowner's concurrence. Should the terraces require further work, Keystone will either compensate the landowner to perform the work or arrange for a local contractor to perform the work.

4.11.8 Right-of-Way and Pipeline Markers

Upon completion of all backfilling, cleanup and restoration, including mulching and seeding of the construction right-of-way, and during the time when the Contractor is making permanent repairs to fences, the Contractor shall install pipeline markers on each side of all roads, railroads, fence lines, stream crossings, and other areas where the pipeline markers do not conflict with intended land use.

4.12 Pasture and Range Lands

The following mitigative measures shall be implemented in addition to the requirements previously stated in Sections 4.1 thru 4.11 unless otherwise approved by Keystone based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Access across the right-of-way during construction shall be provided at locations requested by landowners, if practicable.
- Shavings produced during pipe bevel operations are to be removed immediately to ensure that livestock and wildlife do not ingest this material.

- Litter and garbage shall be collected and removed from the construction site at the end of the day's activities.
- Temporary gates shall be installed at fence lines for access to the construction right-of-way. These gates shall remain closed at all times. Upon completion of construction, the temporary gates shall be removed and the permanent fence replaced.
- Feeding or harassment of livestock or wildlife is prohibited.
- Construction personnel shall not be permitted to have firearms or pets on the construction right-of-way.
- All food and wastes shall be stored and secured in vehicles or appropriate facilities.
- Areas of disturbance in native range shall be seeded with a native seed mix after topsoil replacement.
- Improved pasture shall be seeded with a seed mix approved by individual landowners.

4.13 Forested Lands

Mitigation measures are required to ensure that pipeline construction activities have a minimal impact on forested lands.

Clearing, grubbing, and grading of trees, brush, and stumps shall be performed in accordance with the following mitigative measures in addition to the requirements previously stated in Sections 4.1 thru 4.11 unless otherwise approved or directed by Keystone based on site-specific conditions or circumstances. Keystone will address mitigation, reclamation and remediation measures with individual landowners and comply with any applicable state requirements. These measures include non-vegetative remediation to reverse impacts on windbreaks, shelterbelts, and living snow fences. Where the pipeline follows an existing ROW in forested areas, Keystone attempted to route the pipeline as close as practical to the existing ROW. All work shall be conducted in accordance with applicable permits.

- Prior to the start of clearing activity, right-of-way boundaries, including preapproved temporary workspaces, shall be clearly staked to prevent disturbance of unauthorized areas.
- If trees are to be removed from the construction right-of-way, Keystone shall consult with the landowner or landowner's designate to see if there are trees of commercial or other value to the landowner. Timber shall be salvaged as per landowner request.
- If there are trees of commercial or other value to the landowner, Keystone shall allow the landowner the right to retain ownership of the trees with the disposition of the trees to be negotiated prior to the commencement of land clearing and included in the easement agreement.
- If not performed by the landowner, the construction right-of-way Contractor may salvage all marketable timber from designated areas.

- Tree stumps shall be grubbed to a maximum of 5 feet on either side of the trench line and where necessary for grading a level surface for pipeline construction equipment to operate safely.
- Keystone shall follow the landowner's or landowner designee's desires as stated in the easement agreement regarding the disposal of trees, brush, and stumps of no value to the landowner by burning, burial, etc., or complete removal from any affected property.
- Timber salvage operations shall use cut-off-type saw equipment. Felling shall be undertaken in a manner that minimizes butt shatter, breakage, and off ROW disturbance. Skidders or alternate equipment shall be used to transport salvaged logs to stacking sites.
- Trees shall be felled to fall toward the center line of the right-of-way to avoid breaking trees and branches off ROW. Leaners (felled trees that inadvertently fall into adjacent undisturbed vegetation) shall be salvaged.
- Trees and slash falling outside the right-of-way shall be recovered and disposed..
- Salvaged logs shall be limbed and topped before removal from the construction right-of-way. Log decks (if required) shall be oriented to best facilitate loading by picker trucks and be located adjacent to the working side of the right-of-way, where possible.
- The Contractor shall not be allowed to dispose of woody debris in wooded areas along the pipeline right-of-way.
- Pruning of branches hanging over the right-of-way shall be done only when necessary for construction. Any branch that is broken or seriously damaged should be cut off near its fork and the collar of the branch preserved.
- All tree wastes, stumps, tree crowns, brushes, branches, and other forest debris shall be either burned, chipped (using a mobile chipper), or removed from the right-of-way according to Keystone instructions contained in the specific mitigation measures. Burial of this waste material on the site by the Contractor shall require the landowner's authorization. Chips must not be spread over cultivated land. However, they may be spread and incorporated with mineral soil over the forest floor at a density that shall not prevent revegetation of grass.
- Stump removal and brush clearing shall be done with bulldozers equipped with brush rakes to preserve organic matter.
- Decking sites shall be established: (1) approximately 2000 feet apart in timbered areas; (2) on sites located on approved temporary workspace in existing cleared areas; (3) in non-merchantable stands of timber; or (4) if no other options are available, in merchantable timber stands. Deck sites shall be appropriately sized to accommodate the loading equipment.
- If the landowner does not want the timber, the Contractor shall remove decked timber from the construction right-of-way and transport it to a designated all-weather access point or mill

4.14 Residential and Commercial/Industrial Areas

4.14.1 Residential and Commercial Areas

The principal measures that shall be used to mitigate impacts on existing residential and commercial areas include the following unless otherwise directed or approved by Keystone based on site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- notifying landowners prior to construction;
- posting warning signs as appropriate;
- reducing the width of construction right-of-way, if practicable, by eliminating the construction equipment passing lane, reducing the size of work crews, or utilizing the "stove pipe" or "drag section" construction techniques;
- removing fences, sheds, and other improvements as necessary for protection from construction activities;
- to the extent possible, preserving mature trees and landscaping while ensuring the safe operation of construction equipment;
- fencing the edge of the construction work area that is within 25 feet to a residence for a distance of 100 feet on either side of the residence to ensure that construction equipment and materials, including the spoil pile, remain within the construction work area;
- limiting the hours during which operations with high-decibel noise levels (i.e., drilling and boring) can be conducted;
- limiting dust impact through prearranged work hours and by utilizing dust minimization techniques;
- ensuring that construction proceeds quickly through such areas, thus minimizing exposure to nuisance effects such as noise and dust;
- maintaining access and traffic flow during construction activities, particularly for emergency vehicles;
- cleaning up construction trash and debris daily;
- fencing or plating open ditches during non-construction activities;
- if the pipeline centerline is within 25 feet of a residence, ensuring that the trench is not excavated until the pipe is ready for installation and that the trench shall be backfilled immediately after pipe installation; and
- immediately after backfilling the trench, restoring all lawn areas, shrubs, specialized landscaping, fences, and other structures within the construction work area to its pre-construction appearance or the requirements of the landowner. Restoration work shall be done by personnel familiar with local horticultural and turf establishment practices.
- to the extent possible, preserving mature trees and landscaping while ensuring the safe operation of construction equipment;
- 4.14.2 Site-Specific Plans

For any residence or commercial/industrial building closer than 25 feet to the construction work area, Keystone shall prepare a site-specific construction plan. The plan shall include:

- a description of construction techniques to be used;
- a dimensioned site plan that shows, at a minimum:
 - the location of the residence or commercial/industrial area in relation to the new pipeline;
 - ° the edge of the construction work area;
 - ° the edge of the new permanent construction right-of-way; and
 - other nearby topographical obstacles including landscaping, trees, structures, roads, parking areas, ditches, and streams; and
- a description of how Keystone would ensure that the trench is not excavated until the pipe is ready for installation and that the trench is backfilled immediately after pipe installation.
- 4.14.3 Landowner Complaint Resolution Procedure

Keystone shall implement a landowner complaint procedure as follows:

- Landowners should first contact the construction spread office to express their concern over restoration or mitigation of environmental damages on their property. The Construction Manager or his designated representative shall respond to the landowner within 24 hours of receipt of the phone call.
- If the landowner has not received a response or is not satisfied with the response, he can contact Keystone's representative at 1-877-880-4881. The landowner should expect a response within 48 hours.

4.15 Fragile Soil Clean-up and Reclamation/Revegetation

4.15.1 General

Fragile soil types are a result of the high percentage of sand content that exists within the surficial soil. Theses soil types exist within regions found in southern South Dakota and central Nebraska and fragile due to their inherent high wind and water erosion potential, low water holding capacity and arid nature of the region, rolling to steep terrain and usually consists of predominantly native prairie landscapes and supports a variety of uses such as livestock grazing, wildlife habitat and recreational opportunities.

- 4.15.2 Right-of-way Construction
 - KXL will educate construction personnel regarding these areas and the necessity to strictly adhere to Project Best Management Practices (BMPs) designed to minimize impacts.

- Minor route re-alignments will be incorporated through these areas to avoid particularly erosion-prone locations, such as ridge tops and existing blowouts as much as practicable.
- KXL will avoid highly saturated areas, such as wetland, to the maximum extent possible.
- Construction soil handling procedures will strive to reduce the width of disturbance to the native prairie landscape by adopting "Trench-line or Blade-width stripping procedures where practicable.
- Topsoil conservation will be conducted on all areas where excavation occurs.
- Topsoil piles will be protected from erosion through matting, mulching, watering or tackifying as deemed practicable.
- Traffic management limitations will be employed on specific areas possessing high erosion potential or sensitive habitat.
- 4.15.3 Right-of-Way Reclamation
 - Native seed mixes will be developed with input from the local NRCS offices and through collaboration with regional experts. All seed will be certified noxious weed-free and will be calculated on a pure live seed (PLS) basis.
 - Straw or native prairie hay may be used as mulch, applied to the right-of-way and crimped into the soil to prevent wind erosion. All mulch will be documented as noxious weed-free.
 - Land imprinting may be employed to create impressions in the soil, thereby reducing erosion, improving moisture retention and creating micro-sites for seed germination.
 - Sediment logs or straw wattles will be used in place of slope breakers (short terraces) that are constructed of soil. Using sediment logs will result in less soil disturbance to the right-of-way.
 - Photodegradable matting will be applied on steep slopes or areas prone to extreme wind exposure such as north- or west-facing slopes and ridge tops. Biodegradable pins will be used in place of metal staples to hold the matting in place.
 - Keystone will work with landowners to evaluate fencing the rightof-way from livestock, or alternatively, provide compensation to rest a pasture until vegetation can become established. Management concerns such as livestock access to water or movement within a pasture would be incorporated as necessary.
- 4.15.4 Post-Construction

Keystone is committed to post-construction monitoring and repair and will monitor reclamation on the right-of-way for several years and repair
erosion and reseed poorly revegetated areas as necessary. During monitoring, landowners are informed of our efforts and intentions.

A noxious weed management plan will be established on these lands pending consultation with state and county experts

4.16 **Operations and Maintenance**

Operations and maintenance programs, such as vegetation management, pipeline maintenance, integrity surveys, and hydrostatic testing, may have an impact on the final reclamation of the right-of-way. To ensure the integrity of the facility and land surface reclamation of the right-of-way is maintained after completion of construction and that regulatory requirements are adhered to during operations, the following measures shall be implemented unless otherwise directed by Keystone in response to site-specific conditions or circumstances. All work shall be conducted in accordance with applicable permits.

- Keystone shall monitor the pipeline right-of-way and all stream crossings for erosion or other potential problems that could affect the integrity of the pipeline. Any erosion identified shall be reclaimed as expediently as practicable by Keystone or by compensating to the landowner to reclaim the area.
- Trench depressions on ditch line that may interfere with natural drainage, vegetation establishment, or land use shall be repaired as expediently as practicable by Keystone or by compensating the landowner to repair the area.
- Post-construction monitoring inspections shall be conducted after the first growing season to determine the success of revegetation, unless otherwise required by permit. Areas which have not been successfully re-established shall be revegetated by Keystone or by compensation of the landowner to reseed the area. If, after the first growing season, revegetation is successful, no additional monitoring shall be conducted unless otherwise required by permit.
- In non-agricultural areas, revegetation shall be considered successful if, • upon visual survey, the density and cover of non-nuisance vegetation are similar in density and cover to adjacent undisturbed lands, unless otherwise required by permit.
- In agricultural areas, revegetation shall be considered successful if crop yields are similar to adjacent undisturbed portions of the same field.
- Restoration shall be considered successful if the surface condition is similar to adjacent undisturbed lands, construction debris is removed (unless requested otherwise by the landowner or land managing agency), revegetation is successful, and drainage has been restored.
- Weed control measures shall be implemented as required by any applicable • plan and in conjunction with the landowner.
- Keystone shall be responsible for correcting tile line or irrigation system

repairs that fail, provided those repairs were made by Keystone. Keystone shall not be responsible for tile line or irrigation system repairs which Keystone compensated the landowner to perform.

- When requested by owners in cultivated land, Keystone shall monitor the yield of land impacted by construction with the help of agricultural specialists. If yield deficiencies are indicated compared to yields on unaffected land, Keystone will compensate the landowner for reduced yields and shall implement procedures to return the land to equivalent capability.
- In residential areas, landowners may use the right-of-way provided they do not interfere with the rights granted to Keystone. Trees, bushes, structures, including houses, tool sheds, garages, poles, guy wires, catch basins, swimming pools, trailers, leaching fields, septic tanks, and any other objects not easily removable, shall not be permitted on the permanent construction right-of-way without the written permission of Keystone, because they could impair access for maintenance of the pipeline.
- Keystone shall maintain communication with the landowner and tenant throughout the operating life of the pipeline to allow expedient communication of issues and problems as they occur. Keystone shall provide the landowner with corporate contact information for these purposes. Keystone shall work with landowners to prevent excessive erosion on lands disturbed by construction. Reasonable methods shall be implemented to control erosion. These may not be implemented if the property across which the pipeline is constructed is bare cropland which the landowner intends to leave bare until the next crop is planted.
- If the landowner and Keystone cannot agree upon a reasonable method to control erosion on the landowner's property, the recommendations of the appropriate NRCS office shall be considered by Keystone and the landowner.

5.0 DRAIN TILE SYSTEMS

5.1 General

If underground drainage tile is damaged by the pipeline installation, it shall be repaired in a manner that ensures the tile line's proper operating condition at the point of repair. Keystone may elect to negotiate a fair settlement with the affected county or landowner for repair of the damaged drain tile. In the event the landowner chooses to have the damaged tile repaired by Keystone, the Contractor shall follow these guidelines and procedures to identify the location of drain tiles, to mitigate damages to drain tiles prior to and during construction, to repair drain tiles damaged during installation of the pipeline, to inspect the proper repair of drain tiles, and to provide post-construction monitoring to determine any impacts caused by repair of drain tiles. Since all public and private drain tile systems are unique, i.e., varying age, depth of cover, type of material, geometry on the land, etc., it is not possible to develop a standard procedure for resolving each county's or landowner's drain tile issues. These guidelines provide a basis on which to develop site specific methodology to mitigate damage and to repair drain tiles affected by construction of the Project. A typical right-of-way layout and typical orientation for crossing drain tiles is provided in Detail 25. Typical header and main crossovers are provided in Details 26 and 27. Actual measures will be developed based on site-specific information unique to specific installations. However, all work will be conducted in accordance with applicable permits.

5.2 Identification and Classification of Drain Tile Systems

Personnel shall attempt to identify and classify existing drain tile systems by meeting with local public officials and county engineers, and individual private landowners and tenants.

5.2.1 Publicly Owned Drain Tiles

Personnel shall identify and meet with the responsible county or local authority responsible for publicly owned drain tiles. Publicly owned drain tiles shall be identified and documented on the Project's 1" = 2000' USGS quad strip maps and additional data collected for input into an electronic spreadsheet by county, township, range, and section; responsible agency; and size, type, and depth of cover (if known). This data shall be cross-referenced to the centerline survey to be completed by Keystone. Additionally, any public records including maps or easement instruments on the drain tiles shall be acquired as well as any requirements of the local authority for installation of the pipeline.

5.2.2 Privately Owned Drain Tiles

Right-of-way agents shall meet with landowners and tenants of privately owned land along the route. As a minimum, the right-of-way agents shall ascertain the data concerning drain tiles outlined in a landowner questionnaire. The questionnaire requests data concerning: type of drain tile system; size, type of material, and depth of cover; preference for repair of drain tiles; and identification of local drain tile contractors. These data shall be collected into an electronic spreadsheet for utilization by right-ofway personnel in negotiating payments for easements and damages and by engineering or construction personnel for inclusion in specifications for the construction Contractor.

5.3 Mitigation of Damage to Drain Tile Systems

Keystone shall undertake mitigation measures to reduce damage to publicly and privately owned drain tile systems prior to and during installation of the pipeline.

5.3.1 Non-interference with Drain Tile

The Project shall be installed at a depth of cover and elevation so as not to interfere with the elevation and grade of existing drain tiles where practicable. Where not practicable, Keystone shall pursue alternative mitigation measures mutually acceptable to the landowner and jurisdictional agencies. Typically, the pipeline shall be installed below the elevation of drain tiles with a minimum clearance of 12 inches. Detail 25, Typical Right-of-Way Layout/Soil Handling, represents a typical drain tile crossing by the

pipeline with additional temporary work space to facilitate handling of topsoil and trench spoil created by the additional depth of cover for the pipeline.

5.3.2 Non-disturbance of Drain Tile Mains

Publicly owned and privately owned drain tile mains shall be identified through the processes identified in Section 5.2. Drain tile mains are essential to the overall drainage system of a land area and if disturbed, may require excessive pumping/dewatering of the pipe trench unless temporarily repaired and maintained until permanently repaired.

Keystone shall review drain tile mains and consider their size, flow rate, type of material, depth of cover, and geographic location. If determined to be practicable and reasonable for construction, the drain tile main shall not be cut and repaired during mainline installation (a pipe section shall be left out and installed by a tie-in crew without damaging the drain tile main).

5.3.3 Relocation or Replacement of Existing Drain Tiles Prior to Construction

In many instances, drain tile systems that have been installed after the installation of adjacent existing pipelines were installed with "headers" parallel to the existing pipeline with periodic jump overs as depicted on Detail 26, Header/Main Crossovers of Keystone XL Pipeline. The distance of these headers from the existing pipeline may vary.

Some of these drain tile headers may be most effectively relocated and/or replaced to the east of the Project. The existing header will be capped and made into a single drain tile as depicted on Detail 27, Relocate/Replace Drainage Header/Main. This could reduce the number of drain tile crossings on a particular landowner's property by a significant quantity, thereby reducing the risk that repairs will fail.

5.3.4 Future Drain Tiles/Systems

Keystone shall attempt to determine where public agencies and private landowners or tenants are proposing to install drain tile systems in the future. These locations shall be input into an electronic spreadsheet by county, township, range, and section; landowner or responsible public agency; and proposed size and depth of cover. Keystone shall endeavor to construct the pipeline at a depth and elevation to accommodate the future installation of the proposed drain tile systems.

5.3.5 Other Mitigation Measures

Other mitigation measures that may be implemented during installation of the pipeline are as follows:

- not removing topsoil from the working side of the construction right-ofway to prevent crushing of drain tile by heavy equipment;
- spreading ditch and spoil side topsoil (not subsoil) over the working side to provide additional soil depth to protect existing drain tiles;

- restricting the work of the pipe lower in crew if ground conditions are too wet to adequately support the heavy equipment;
- limiting travel of heavy equipment the working lane of the construction right-of-way where possible;
- limiting travel of heavy equipment to one pass over the drain tile per work crew where possible; and
- removing and replacing topsoil during drain tile replacement should tile be crushed on the working side of the right-of-way.

5.4 Responsibility for Repair of Drain Tile Systems

Temporary and permanent drain tile repairs shall be the responsibility of the Contractor. The physical repairs shall be made by qualified and experienced drain tile repair personnel.

5.4.1 Local Drain Tile Contractor Repair

Keystone shall identify and qualify local drain tile contractors in the geographical area of the pipeline route from interviews with local public officials, landowners, tenants, and drain tile contractors. The preferred responsibility for permanent repair of drain tiles shall be for the pipeline Contractor to subcontract the supervision and repair to local reputable drain tile contractors acceptable to the landowners and tenants.

5.4.2 Pipeline Contractor Repair

In the event local drain tile contractors are not available to subcontract the supervision and repair, permanent repair shall be made with the Contractor's supervision, equipment, and labor.

5.4.3 Landowner/Tenant Repair

The landowner or tenant may agree to take responsibility for the permanent repair of his drain tiles if not precluded by regulatory agency. The landowner or tenant shall be requested to ensure his ability to coordinate and complete the drain tile repair in a timely manner to allow the pipeline Contractor to completely backfill the damaged drain tile for repair by landowner/tenant in the immediate future. Keystone shall require that its representative be present to ensure the permanent drain tile repairs are made in accordance with the minimum requirements of this manual.

5.5 Drain Tile Repairs

The Contractor shall endeavour to locate all tile lines within the construction right-of-way prior to and during installation so repairs can be made if necessary.

5.5.1 Temporary Repairs During Construction

Drain tiles damaged or cut during the excavation of the trench shall be marked with a lath and ribbon in the spoil bank. Care shall be taken to

locate markers where the chance of disturbance shall be minimized and a written record maintained of each drain tile crossing. A work crew following the pipeline trench crew shall complete a temporary repair to allow continuing flow. Detail 28, Temporary Drain Tile Repair, depicts the materials and installation procedure to complete the temporary repair. If a drain tile line shall not be temporarily repaired, the open ends of the drain tile shall be screened to prevent entry of foreign materials and small animals.

5.5.2 Permanent Repairs

Permanent repairs shall be made for all drain tiles damaged by installation of the pipeline.

5.5.2.1 Ditch Line Only Repairs

If water is flowing through a damaged tile line, the tile line shall be immediately and temporarily repaired until such time that permanent repairs can be made. If tile lines are dry and water is not flowing, temporary repairs are not required if the permanent repair is made within 7 days of the time damage

occurred. The temporary repair shall be removed just prior to lowering in the pipeline.

Drain tiles must be permanently repaired before the pipeline trench is backfilled and within 14 days of construction completion, weather and soil conditions permitting. All tile lines shall be repaired with materials of the same or better quality as that which was damaged. The drain tile marker shall not be removed until the tile repairs have been inspected, approved, and accepted by Keystone's inspectors, the county inspectors, where applicable, and the landowner or tenant. Detail 29, Permanent Repair Method of Drain Tiles, depicts the minimum materials and installation procedure to complete a permanent repair.

5.5.2.2 Ditch Line and Temporary Work Space Repairs

Prior to making the permanent drain tile repair, the Contractor shall probe a segmented sewer rod with a plug that is not more than 15% smaller than the internal diameter of the drain tile to determine if additional damage has occurred to the drain tile. If the probe does not freely insert into the drain tile across the temporary workspace of pipeline construction, the Contractor shall excavate, expose, and repair the damaged drain tile to its original or better condition.

5.6 Inspection/Acceptance of Drain Tile Repairs

Drain tile repairs shall be inspected by Keystone construction inspectors, county inspectors, as applicable, and the landowner or tenant or his representative.

Keystone shall designate inspector(s) for the sole purpose and responsibility for inspection of all repairs of drain tiles. These inspectors shall be, if possible, employed from local drain tile installation contractors, local farmers with extensive drain tile experience, or previously employed or retired employees of local jurisdictions familiar with drain tile installation and repair. In the event that a sufficient quantity of inspectors from these sources is not available, Keystone shall conduct in-the-field training seminars on drain tile repair for additional inspection personnel.

Inspection personnel shall observe the permanent repair of all drain tiles to ensure the replacement drain tile is: (1) the proper size and type; (2) installed at the proper grade; (3) properly supported and backfill beneath the drain tile is properly placed and compacted; and (4) properly tied into the existing drain tile. The inspection shall be documented on the Drain Tile Inspection Report Form.

A drain tile repair shall not be accepted until Keystone's construction inspector and the landowner or tenant or designated representative approves the inspection form.

6.0 WETLAND CROSSINGS

6.1 General

Wetland boundaries shall be clearly marked in the field with signs and/or highly visible flagging during construction.

In the event a waterbody crossing is located within or adjacent to a wetland crossing, the measures of both Section 6 - Wetland Crossings and Section 7 - Waterbodies and Riparian Lands shall be implemented to the extent practicable.

A dry wetland is defined in Section 6.5.1. In these wetlands, equipment can traverse the wetland without the support of mats or timber riprap.

A standard wetland environment typically has soils that are saturated and noncohesive. Difficult trenching conditions are likely resulting in excessively wide trenches. In these wetland environment types, supplemental support in the form of timber riprap or prefabricated equipment mats may be required for construction equipment to safely and efficiently operate.

A flooded wetland involves the presence of standing water over much of the wetland area. Equipment typically cannot traverse the wetland and must generally move around that portion of the area. Access is typically limited to marsh backhoes or equipment working from flexifloats or equivalents.

Keystone may allow modification of the following specifications as necessary to accommodate site-specific conditions or procedures. Any modifications must still comply with all applicable regulations and permits.

6.2 Easement and Workspace

The Contractor shall maintain wetland boundary markers during construction in all areas and until permanent seeding is complete in non-cultivated areas.

The width of the construction right-of-way shall be reduced to 85 feet or less in standard wetlands unless non-cohesive soil conditions require utilization of a greater width and unless the USACE or other regulatory authority authorizes a greater width.

The Contractor shall locate extra work areas (such as staging areas and additional spoil storage areas) shall be at least 10 feet away from wetland boundaries, where topographic conditions permit.

The Contractor shall limit clearing of vegetation between extra work areas and the edge of the wetland to the construction right-of-way and limit the size of extra work areas to the minimum needed to construct the wetland crossing.

6.3 Vehicle Access and Equipment Crossing

The only access roads, other than the construction right-of-way, that the Contractor shall use in wetlands are those existing public roads and private roads acquired by Keystone from the landowner shown on the construction drawings.

To the extent practicable, the Contractor's construction equipment operating in saturated wetlands or wetlands with standing water shall be limited to that needed to clear the construction right-of-way, dig the trench, fabricate and install the pipeline, backfill the trench, and restore the construction right-of-way.

If equipment must operate within a wetland containing standing water or saturated soils, the Contractor shall use the following methods for equipment access unless otherwise approved by Keystone based on site-specific conditions:

- wide-track or balloon-tire construction equipment; and
- conventional equipment operated from timber and slash (riprap) cleared from the right-of-way, timber mats, or prefabricated equipment mats.

6.4 Temporary Erosion and Sediment Control

The Contractor shall install sediment barriers across the entire construction rightof-way immediately upslope of the wetland boundary at all standard wetland crossings, as necessary, to prevent sediment flow into the wetland. Sediment barriers must be properly maintained by the Contractor throughout construction and reinstalled as necessary. In the travel lane, these may incorporate removable sediment barriers or drivable berms. Removable sediment barriers can be removed during the construction day, but shall be re-installed after construction has stopped for the day or when heavy precipitation is imminent. The Contractor shall maintain sediment barriers until replaced by permanent erosion controls or restoration of adjacent upland areas is complete. The Contractor shall not install sediment barriers at wetlands designated as "dry" unless otherwise specified by Keystone.

Where standard wetlands are adjacent to the construction right-of-way, the Contractor shall install sediment barriers along the edge of the construction right-of-way as necessary to prevent a sediment flow into the wetland.

6.5 Wetland Crossing Procedures

The following general mitigative procedures shall be followed by the Contractor in all wetlands unless otherwise approved or directed by Keystone based on site-specific conditions. All work shall be conducted in accordance with applicable permits.

• limit the duration of construction-related disturbance within wetlands to the extent practicable;

- use no more than two layers of timber riprap to stabilize the construction right-of-way;
- cut vegetation off at ground level leaving existing root systems in place and remove it from the wetland for disposal;
- limit pulling of tree stumps and grading activities to directly over the trench line unless safety concerns require the removal of stumps from the workingside of the construction ROW;
- segregate a maximum of 12 inches of topsoil from the area disturbed by trenching in dry wetlands, where practicable;
- restore topsoil to its approximate original stratum, after backfilling is complete;
- dewater the trench in a manner to prevent erosion and heavily silt-laden flowing directly into any wetland or waterbody;
- remove all timber riprap and prefabricated equipment mats upon completion of construction;
- locate hydrostatic test manifolds outside wetlands and riparian areas to the maximum extent practicable;
- prohibit storing hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating activities in a wetland, or within 100 feet of any wetland boundary;
- perform all equipment maintenance and repairs upland locations at least 100 feet from waterbodies and wetlands;
- avoid parking equipment overnight within 100 feet of a watercourse or wetland;
- prohibit washing equipment in streams or wetlands;
- install trench breakers and/or seal the trench to maintain the original wetland hydrology, where the pipeline trench may drain a wetland;
- attempt to refuel all construction equipment in an upland area at least 100 feet from a wetland boundary (otherwise follow the procedures outlined in Section 3); and
- avoid sand blasting in wetlands to the extent practicable. If sandblasting is
 performed within a wetland, the Contractor shall place a tarp or suitable
 material in such a way as to collect as much waste shot as possible and
 dispose of the collected waste. The Contractor shall clean up all visible
 deposits of wastes and dispose of the waste at an approved disposal facility.

Specific procedures for each type of wetland crossing method are listed below and shall be designated on the construction drawings but may be modified depending on site conditions at the time of construction. All work shall be conducted in accordance with applicable permits.

6.5.1 Dry Wetland Crossing Method

Topsoil shall be segregated. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace.

The dry wetland crossing procedure depicted in Detail 8 shall be used where this type of wetland is identified on the construction drawings. The following are exceptions to standard wetland crossing methods:

- The width of the construction right-of-way for upland construction is maintained through the wetland.
- Where extra work areas (such as staging areas and additional spoil storage areas) are designated on the construction drawings, they may be placed no closer than 10 feet from the wetland's edge.
- Seeding requirements for agricultural lands shall be applied to farmed wetlands.
- 6.5.2 Standard Wetland Crossing Method

Topsoil stripping is impracticable due to the saturated nature of the soil. Pipe stringing and fabrication may occur within the wetland adjacent to the trench line or adjacent to the wetland in a designated extra workspace. Based upon the length of a standard wetland crossing and presence of sufficient water to float the pipe, the Contractor may elect to install a standard wetland crossing utilizing the "push/pull" method.

The standard wetland crossing procedure depicted in Detail 9 shall be used where this type of wetland is identified on the construction drawings.

Procedures unique to standard wetlands include:

- limiting construction right-of-way width to a maximum of 85 feet unless site conditions warrant a wider width;
- utilizing low-ground-pressure construction equipment or support equipment on timber riprap or timber mats; and
- installing sediment barriers across the entire right-of-way where the right-of-way enters and exits the wetland.
- 6.5.3 Flooded Push/Pull Wetland Crossing Method

Where standing surface water or high groundwater levels make trenching difficult, trench widths up to 35 feet are common. Topsoil stripping is impossible due to the flooded conditions. Pipe stringing and fabrication is required adjacent to the wetland in a designated extra workspace. Using floatation devices, the pipe string is pushed and pulled from the extra workspace to the trench.

The Push/Pull wetland crossing procedure as depicted in Detail 10 shall be used where water is sufficient to float the pipeline in the trench and other site conditions allow. Clean metal barrels or Styrofoam floats may be used to assist in the flotation of the pipe. Metal banding shall be used to secure the barrels or floats to the pipe. All barrels, floats, and banding shall be recovered and removed upon completion of lower in. Backfill shall not be allowed before recovery of barrels, floats, and banding.

6.6 Restoration and Reclamation

All timber riprap, timber mats, and prefabricated equipment mats and other construction debris shall be removed upon completion of construction. As much as is feasible, the Contractor shall replace topsoil and restore original contours with no crown over the trench. Any excess spoil shall be removed from the wetland. The Contractor shall stabilize wetland edges and adjacent upland areas by establishing permanent erosion control measures and revegetation, as applicable, during final clean up.

For each standard wetland crossed, the Contractor shall install a permanent slope breaker and trench breaker at the base of slopes near the boundary between the wetland and adjacent upland areas. The Contractor shall locate the trench breaker immediately upslope of the slope breaker.

The Contractor shall not use fertilizer, lime, or mulch in wetlands unless required in writing by the appropriate land management agency.

All wetland areas within conservation lands or easements will be restored to a level consistent with any additional criteria established by the relevant managing agency.

7.0 WATERBODIES AND RIPARIAN AREAS

7.1 General

The Contractor shall comply with requirements of all permits issued for the waterbody crossings by federal, state or local agencies.

Waterbody includes any areas delineated as jurisdictional natural or artificial stream, river, or drainage, and other permanent waterbodies such as ponds and lakes:

- Minor Waterbody includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction.
- Intermediate Waterbody includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of construction.
- Major Waterbody includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.

In the event a waterbody crossing is located within or adjacent to a wetland crossing, the Contractor, to the extent practicable, shall implement the provisions of both Section 6 - Wetland Crossings and Section 7 - Waterbodies and Riparian Areas.

The Contractor shall supply and install advisory signs in a readily visible location along the construction right-of-way at a distance of approximately 100 feet on each side of the crossing and on all roads which provide direct construction access to waterbody crossing sites. Signs shall be supplied, installed, maintained, and then removed upon completion of the Project. Additionally, signs shall be supplied and installed by the Contractor on all intermediate and major waterbodies accessible to recreational boaters warning boaters of pipeline construction operations.

The Contractor shall not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating within 100 feet of any waterbody. The Contractor shall not refuel construction equipment within 100 feet of any waterbody. If the Contractor must refuel construction equipment within 100 feet of a waterbody, it must be done in accordance with the requirements outlined in Section 3. All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands. All equipment parked overnight shall be at least 100 feet from a watercourse or wetland, if possible. Equipment shall not be washed in streams or wetlands.

Throughout construction, the Contractor shall maintain adequate flow rates to protect aquatic life and to prevent the interruption of existing downstream uses.

Keystone may allow modification of the following specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits. Keystone will complete site-specific

crossing plans for certain waterbody crossings if required by the applicable regulatory agencies during federal or state permitting processes.

7.2 Easement and Work Space

The permanent easement, temporary work space, additional temporary work space, and any special restrictions shall be depicted on the construction drawings. The work shall be contained within these areas and be limited in size to the minimum required to construct the waterbody crossing.

The Contractor shall locate all extra work areas (such as staging areas and additional spoil storage areas) at least 10 feet from the water's edge if practicable.

At all waterbody crossings, the Contractor shall install flagging across the construction right-of-way at least 10 feet from the water's edge prior to clearing and ensure that riparian cover is maintained where practicable during construction.

7.3 Vehicle Access and Equipment Crossings

The Contractor shall inspect equipment for fluid leaks prior to entering or crossing over waterbodies.

Equipment bridges shall be installed at all flowing waterbodies and as directed by the Keystone EI. Equipment crossings shall be constructed as described in Details 16, 17 and/or 18.

Equipment crossings shall be perpendicular to drainage bottoms wherever possible.

Erosion and sediment control barriers will be installed and maintained around vehicle access points as necessary to prevent sediment from reaching the waterway.

The Contractor shall be responsible for the installation, maintenance, and removal of all temporary access crossings including portable bridges, bridges made from timber or mats, flumes, culverts, sand bags, subsoil, coarse granular material, and riprap.

The Contractor shall ensure that culverts and flumes are sized and installed of sufficient diameter to accommodate the existing flow of water and those that may potentially be created by sudden runoffs. Flumes shall be installed with the inlet and outlet at natural grade if possible.

Where bridges, culverts or flumes are installed across the work area, the Contractor shall be responsible for maintaining them (e.g. preventing collapse, clogging or tilting). All flumes and culverts shall be removed as soon as possible upon completion of construction. The width of the temporary access road across culverts and flumes and the design of the approaches and ramps shall be adequate for the size of vehicle and equipment access required. The ramps shall be of sufficient depth and constructed to prevent collapse of the flumes, and the approaches on both sides of the flume shall be feathered.

Where culverts are installed for access, the culvert shall be of sufficient length to convey the stream flow through the construction zone.

The Contractor shall maintain equipment bridges to prevent soil from entering the waterbody.

7.4 Waterbody Crossing Methods

Construction methods pertinent to waterbody crossings are presented below. Selection of the most appropriate method at each crossing shall be depicted on the construction drawings but may be amended or changed based on sitespecific conditions (i.e., environmental sensitivity of the waterbody, depth, and rate of flow, subsurface soil conditions, and the expected time and duration of construction) at the time of crossing. Construction will involve dry-ditch techniques at crossings where the timing of construction does not adequately protect environmentally sensitive waterbodies, as determined by the appropriate regulatory authority. Where required, horizontal directional drilling (HDD) will be used at designated major and sensitive waterbodies crossings. Each waterbody crossing shall be accomplished using one of the following construction methods:

- Non-flowing Open Cut Crossing Method (Detail 11)
- Flowing Open Cut Crossing Method Minor, Intermediate or Major Waterbody - (Detail 12)
- Flowing Stream Crossing Dry Flume Method (Detail 13)
- Flowing Stream Crossing Dry Dam-and-Pump Method (Detail 14)
- Horizontal Directional Drill Crossing (Detail 15)
- Horizontal Bore Crossing (Detail 21)

In conjunction with the appropriate jurisdictional agency, Keystone will develop specific crossing plans for major water bodies that contain recreationally or commercially important fisheries, or are classified as special use. Keystone will consult with state fisheries agencies with respect to applicable construction windows for each crossing and develop specific construction and crossing methods for open cuts in conjunction with USACE permitting and USFWS consultation.

7.4.1 Non-flowing Open Cut Crossing Method

The Contractor shall utilize the Non-flowing Open Cut Crossing Method (Detail 11) for all waterbody crossings (ditches, gullies, drains, swales, etc.) with no perceptible flow at the time of construction. Should site conditions change and the waterbody is flowing at the time of

construction, the Contractor shall install the crossing utilizing the Flowing Open Cut Crossing Method (Detail 12) unless otherwise approved by Keystone.

7.4.2 Flowing Open Cut Crossing Method of Minor, Intermediate, and Major Waterbodies

For minor waterbody crossings, except where the flume method is used, the Contractor shall complete construction in the waterbody (not including blasting, if required) as shown on Detail 12 within 24 hours if practicable.

For intermediate waterbodies, the Contractor shall attempt to complete trenching and backfill work within the waterbody (not including blasting if required) within 48 hours if practicable as shown on Detail 12.

The Contractor shall construct each major waterbody crossing in accordance with a site-specific plan as shown in the construction drawings. The Contractor shall complete in-stream construction activities as expediently as practicable.

7.4.3 Flowing Stream Crossing – Dry Flume Method

Where required, the Contractor shall utilize the Flowing Open Cut Crossing – Dry Flume Method as shown on Detail 13 with the following "dry ditch" techniques:

- Flume pipe shall be installed after blasting (if necessary), but before any trenching.
- Sand bag, sand bag and plastic sheeting diversion structure, or equivalent shall be used to develop an effective seal and to divert stream flow through the flume pipe (some modifications to the stream bottom may be required in order to achieve an effective seal).
- Flume pipe(s) shall be aligned to prevent bank erosion and streambed scour.
- Flume pipe shall not be removed during trenching, pipe laying, or backfilling activities, or initial streambed restoration efforts.
- All flume pipes and dams that are not also part of the equipment bridge shall be removed as soon as final clean up of the stream bed and bank is complete.
- 7.4.4 Flowing Stream Crossing Dry Dam-and-Pump Method

Where specified in the construction drawings, the Contractor shall utilize the Flowing Open Cut Crossing – Dry Dam-and-Pump Method as shown on Detail 14. The dam-and-pump crossing method shall meet the following performance criteria:

 sufficient pumps to maintain 1.5 times the flow present in the stream at the time of construction;

- at least one back up pump available on site;
- dams constructed with materials that prevent sediment and other pollutants from entering the waterbody (e.g., sandbags or clean gravel with plastic liner);
- screen pump intakes installed;
- streambed scour prevented at pump discharge; and
- dam and pumps shall be monitored to ensure proper operation throughout the waterbody crossing.
- 7.4.5 Horizontal Directional Drill Crossings

Where required, the horizontal directional drill method as shown on Detail 15 shall be utilized for designated major and sensitive waterbodies. The Contractor shall construct each directional drill waterbody crossing in accordance with a site specific plan as shown in the construction drawings.

Drilling fluids and additives utilized during implementation of a directional drill shall be non-toxic to the aquatic environment.

The Contractor shall develop a contingency plan to address a frac-out during a directional drill. The plan shall include instructions for monitoring during the directional drill and mitigation in the event that there is a release of drilling fluids. Additionally, the waterbody shall be monitored downstream by the Contractor for any signs of drilling fluid.

The Contractor shall dispose of all drill cuttings and drilling mud as permitted by the appropriate regulatory authority at a Keystone-approved location. Disposal options may include spreading over the construction right-of-way in an upland location approved by Keystone or hauling to an approved licensed landfill or other site approved by Keystone.

7.4.6 Horizontal Bore Crossings

Where required, the horizontal bore method as shown on Detail 21 shall be utilized for crossing waterbodies. The Contractor shall construct each horizontal bore waterbody crossing in accordance with a site specific plan as shown in the construction drawings.

7.5 Clearing

Except where rock is encountered and at non-flowing open cut crossings, all necessary equipment and materials for pipe installation must be on site and assembled prior to commencing trenching in a waterbody. All staging areas for materials and equipment shall be located at least 10 feet from the waterbody edge. The Contractor shall preserve as much vegetation as possible along the waterbody banks while allowing for safe equipment operation.

Clearing and grubbing for temporary vehicle access and equipment crossings shall be carefully controlled to minimize sediment entering the waterbody from the construction right-of-way.

Clearing and grading shall be performed on both sides of the waterbody prior to initiating any trenching work. All trees shall be felled away from watercourses.

Plant debris or soil inadvertently deposited within the high water mark of waterbodies shall be promptly removed in a manner that minimizes disturbance of the waterbody bed and bank. Excess floatable debris shall be removed above the high water mark from areas immediately above crossings.

Vegetation adjacent to waterbody crossings by horizontal directional drill or boring methods shall not be disturbed except by hand clearing as necessary for drilling operations.

7.6 Grading

The construction right-of-way adjacent to the waterbody shall be graded so that soil is pushed away from the waterbody rather than towards it whenever possible.

In order to minimize disturbance to woody riparian vegetation within extra workspaces adjacent to the construction right-of-way at waterbody crossings, the Contractor shall minimize grading and grubbing of waterbody banks. To the extent practicable, grubbing shall be limited to the ditch line plus an appropriate width to accommodate safe vehicle access and the crossing.

7.7 Temporary Erosion and Sediment Control

The Contractor shall install and maintain sediment barriers across the entire construction right-of-way at all flowing waterbody crossings.

The Contractor shall install sediment barriers immediately after initial disturbance of the waterbody or adjacent upland. Sediment barriers must be properly maintained throughout construction and reinstalled as necessary (such as after backfilling of the trench) until replaced by permanent erosion controls or restoration of adjacent upland areas is complete.

Where waterbodies are adjacent to the construction right-of-way, the Contractor shall install and maintain sediment barriers along the edge of the construction right-of-way as necessary to contain spoil and sediment within the construction right-of-way.

7.8 Trenching

The following requirements apply to all waterbody crossings except those being installed by the non-flowing open cut crossing method.

All equipment and materials shall be on site before trenching in the active channel of all minor waterbodies containing state-designated fisheries, and in

intermediate and major waterbodies. All activities shall proceed in an orderly manner without delays until the trench is backfilled and the stream banks stabilized. The Contractor shall not begin in-stream activity until the in-stream pipe section is complete and ready to be installed in the waterbody.

The Contractor shall use trench plugs at the end of the excavated trench to prevent the diversion of water into upland portions of the pipeline trench and to keep any accumulated upland trench water out of the waterbody. Trench plugs must be of sufficient size to withstand upslope water pressure.

The Contractor shall conduct as many in-stream activities as possible from the banks of the waterbodies. The Contractor shall limit the use of equipment operating in waterbodies to that needed to construct each crossing.

The Contractor shall place all spoil from minor and intermediate waterbody crossings and upland spoil from major waterbody crossings in the construction right-of-way at least 10 feet from the water's edge or in additional extra work areas. No trench spoil, including spoil from the portion of the trench across the stream channel, shall be stored within a waterbody unless the crossing cannot be reasonably completed without doing so.

The Contractor shall install and maintain sediment barriers around spoil piles to prevent the flow of spoil into the waterbody.

Spoil removed during ditching shall be used to backfill the trench usually with a backhoe, clamshell, or a dragline working from the waterbody bank. Sand, gravel, rockshield, or fill padding shall be placed around the pipe where rock is present in the channel bottom.

7.9 Pipe Installation

The following requirements apply to all waterbody crossings except those being installed by the non-flowing open cut crossing method.

A "free stress" pipe profile shall be used at all minor, intermediate, and major waterbodies with gradually sloping stream banks. The "box bend" pipe profile may be used for intermittent and major waterbodies with steep stream banks.

The trench shall be closely inspected to confirm that the specified cover and adequate bottom support can be achieved, and shall require Keystone approval prior to the pipe being installed. Such inspections shall be performed by visual inspection and/or measurement by a Keystone representative. In rock trench, the ditch shall be adequately padded with clean granular material to provide continuous support for the pipe.

The pipe shall be pulled into position or lowered into the trench and shall, where necessary, be held down by suitable negative buoyancy control, as-built recorded and backfilled immediately to prevent the pipe from floating.

The Contractor shall provide sufficient approved lifting equipment to perform the pipe installation in a safe and efficient manner. As the coated pipe is lowered in,

it shall be prevented from swinging or rubbing against the sides of the trench. Only properly manufactured slings, belts, and cradles suitable for handling coated pipe shall be used. All pipes shall be inspected for coating flaws and/or damage as it is being lowered into the trench. Any damage to the pipe or coating shall be repaired.

7.10 Backfilling

The following requirements apply to all waterbody crossings except those being installed by the non-flowing open cut crossing method.

Trench spoil excavated from waterbodies shall be used to backfill the trench across waterbodies.

After lowering in is complete, but before backfilling, the line shall be re-inspected to ensure that no skids, brush, stumps, trees, boulders, or other debris is in the trench. If discovered, such materials or debris shall be removed from the trench prior to backfilling.

For each major waterbody crossed, the Contractor shall install a trench breaker at the base of slopes near the waterbody unless otherwise directed by Keystone based on site specific conditions. The base of slopes at intermittent waterbodies shall be assessed on site and trench breakers installed only where necessary.

Slurred muck or debris shall not be used for backfill. At locations where the excavated native material is not acceptable for backfill or must be supplemented, the Contractor shall provide granular material approved by Keystone.

If specified in the construction drawings, the top of the backfill in the stream shall be armored with rock riprap or bio-stabilization materials as appropriate.

7.11 Stabilization and Restoration of Stream Banks and Slopes

The Contractor will restore the contours of the bed and banks of all waterways immediately after pipe installation and backfill, except over the travel lane. Travel lanes and bridges may stay in place until hydrostatic testing and cleanup are complete. All materials used to support construction activities will be removed from waterbodies and wetlands, including, but not limited to, flumes, mats, plastic sheeting, and sandbags.

The stream bank contour shall be re-established. All debris shall be removed from the streambed and banks. Stream banks shall be stabilized and temporary sediment barriers shall be installed within 24 hours of completing the crossing if practicable.

Approach slopes shall be graded to an acceptable slope for the particular soil type and surface run off controlled by installation of permanent slope breakers. Where considered necessary, the integrity of the slope breakers shall be ensured by lining with erosion control blankets.

Immediately following reconstruction of the stream banks, the Contractor shall install seed and flexible channel liners on waterbody banks as shown in Detail 19.

If the original stream bank is excessively steep and unstable or flow conditions are severe, or if specified on the construction drawings, the banks shall be stabilized with rock riprap, gabions, stabilizing cribs, or bio-stabilization measures to protect backfill prior to reestablishing vegetation.

Stream bank riprap structures shall consist of a layer of stone, underlain with approved filter fabric or a gravel filter blanket in accordance with Detail 20. Riprap shall extend from the stabilized streambed to the top of the stream bank. Where practicable, native rock shall be utilized.

Bio-stabilization techniques which may be considered for specific crossings are shown in Details 23 and 24.

The Contractor shall remove equipment bridges as soon as possible after final clean up.

8.0 HYDROSTATIC TESTING

8.1 Testing Equipment Location

The Contractor shall provide for the safety of all pipeline construction personnel and the general public during hydrostatic test operations by placing warning signs in populated areas.

The Contractor shall locate hydrostatic test manifolds 100 feet outside wetlands and riparian areas to the maximum extent practicable.

8.2 Test Water Source and Discharge Locations

Keystone is responsible for acquiring all permits required by federal, state and local agencies for procurement of water and for the discharge of water used in the hydrostatic testing operation. Keystone shall provide the Contractor with a copy of the appropriate withdrawal/discharge permits for hydrostatic test water. The Contractor shall keep water withdrawal/discharge permits on site at all times during testing operations.

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

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

The Contractor shall be responsible for obtaining any required water analyses from each source to be used in sufficient time to have a lab analysis performed prior to any filling operations. The sample bottle shall be sterilized prior to filling with the water sample. The analysis shall determine the pH value and total suspended solids. Each bottle shall be marked with:

- source of water with pipeline station number;
- date taken;
- laboratory order number; and
- name of person taking sample.

Staging/work areas for filling the pipeline with water will be located a minimum of 100 feet from the waterbody or wetland boundary if topographic conditions permit. The Contractor will install temporary sediment filter devices adjacent to all streams to prevent sediments from leaving the construction site.

The Contractor shall screen the intake hose to prevent the entrainment of fish or debris. The hose shall be kept at least 1 foot off the bottom of the waterbody. Refueling of construction equipment shall be conducted a minimum distance of 100 feet from the stream or a wetland. Pumps used for hydrostatic testing within 100 feet of any waterbody or wetland shall be operated and refueled in accordance with Section 3.

During hydrostatic test water withdrawals, the Contractor will maintain adequate flow rates in the waterbody to protect aquatic life and provide for downstream uses, in compliance with regulatory and permit requirements.

The Contractor shall not use chemicals in the test water. The Contractor shall not discharge any water containing oil or other substances that are in sufficient amounts as to create a visible color film or sheen on the surface of the receiving water.

Selected road, railroad, and river crossing pipe sections may be specified to be pre-tested for a minimum of 4 hours. The water for pre-testing of any road and railroad crossings shall be hauled by a tanker truck from an approved water source. Water for pre-testing of a river crossing may be hauled or taken from the respective river if it is an approved water source. Since the volume of water utilized in these pre-tests shall be relatively small, the water shall be discharged overland along the construction right-of-way and allowed to soak into the ground utilizing erosion and sediment control mitigative measures.

Selection of final test water sources will be determined based on site conditions at the time of construction and applicable permits.

8.3 Filling the Pipeline

After final positioning of the pipe, the Contractor shall fill the pipe with water. Pipe ends shall not be restrained during the fill. The fill pump shall be set on a metal catch pan of sufficient dimensions to contain all leaking lubricants or fuel and prevent them from entering the water source. The suction inlet must be placed in a screened enclosure located at a depth that shall not allow air to be drawn in with the water. The screened enclosure shall be such that the fill water is free of organic or particulate matter.

The Contractor shall provide a filter of the back flushing or cartridge type with a means of cleaning without disconnecting the piping. The filter shall have the specifications of 100 mesh screen. If the cartridge type is used, a sufficient quantity of cartridges shall be on hand at the filter location. The Contractor shall install the filter between the fill pump and the test header. The Contractor shall be responsible for keeping the back flush valve on the filter closed during the filling operation. The Contractor shall be responsible for the proper disposal of materials back flushed from the filter or filter cartridges. The Contractor shall not be allowed to back flush the filter into the stream or other water source.

During water-filling of the pipeline, the Contractor shall employ fill pumps capable of injecting water into the pipeline at a maximum rate of approximately 0.7 to 1.0 mile per hour, except as limited by permits or the maintenance of adequate flow rates in the waterbody, as follows:

<u>Nominal OD</u>	<u>Max GPM</u>		
0.0"			
36″	3000		

The Contractor shall maintain flow rates as necessary to protect aquatic life, provide for all waterbody uses, and provide for downstream withdrawals of water by existing users.

In areas where zebra mussels are known to occur, all equipment used during the hydrostatic test withdrawal and discharge will be thoroughly cleaned before being used at subsequent hydrostatic test locations to prevent the transfer of zebra mussels or their larvae (veligers) to new locations.

8.4 Dewatering the Pipeline

The Contractor shall comply with state-issued NPDES permits for discharging test water.

The Contractor shall not discharge any water containing oil or other substances that are in sufficient amounts as to create a visible color film on the surface of the receiving water.

The Contractor shall not discharge into state-designated exceptional value waters, waterbodies which provide habitat for federally listed threatened or endangered species, or waterbodies designated as public water supplies, unless appropriate federal, state, and local permitting agencies grant written permission.

To avoid impacts from introduced species, no inter-basin transfers (discharge) of hydrostatic test water will occur.

The discharge operation will be monitored and water samples will be taken prior to the beginning of the discharge to ensure that it complies with the Project and permit requirements. If required by state permits, additional water quality testing will be conducted during discharge, in accordance with permit conditions.

The Contractor shall calculate, record, and provide to Keystone the day, date, time, location, total volume, maximum rate, and methods of all water discharged to the ground or to surface water in association with hydrostatic testing.

The Contractor shall regulate the pig velocity discharge rate (3000 gpm maximum), use energy dissipation devices, and install sediment barriers, as necessary, to prevent erosion, streambed scour, suspension of sediments, or excessive stream flow. Water must be disposed of using good engineering judgment so that all federal, state, and local environmental standards are met. Dewatering lines shall be of sufficient strength and be securely supported and tied down at the discharge end to prevent whipping during this operation.

To reduce the velocity of the discharge, The Contractor shall utilize an energydissipating device described as follows:

8.4.1 Splash Pup

A splash pup consists of a piece of large diameter pipe (usually over 20" outside diameter) of variable length with both ends partially blocked that is welded perpendicularly to the discharge pipe. As the discharge hits against the inside wall of the pup, the velocity is rapidly reduced and the water is allowed to flow out either end. A variation of the splash pup concept, commonly called a diffuser, incorporates the same design, but with capped ends and numerous holes punched in the pup to diffuse the energy.

8.4.2 Splash Plate

The splash plate is a quarter section of 36-inch pipe welded to a flat plate and attached to the end of a 6-inch discharge pipe. The velocity is reduced by directing the discharge stream into the air as it exits the pipe. This device is also effective for most overland discharge.

8.4.3 Plastic Liner

In areas where highly erodible soils exist or in any low flow drainage channel, it is a common practice to use layers of Visqueen (or any of the new construction fabrics currently available) to line the receiving channel for a short distance. One anchoring method may consist of a small load of rocks to keep the fabric in place during the discharge. Additional best management practices, such as the use of plastic sheeting or other material to prevent scour, will be used as necessary to prevent excessive sedimentation during dewatering.

8.4.4 Straw Bale Dewatering Structure

Straw bale dewatering structures are designed to dissipate and remove sediment from the water being discharged. Straw bale structures are used for on land discharge of wash water and hydrostatic test water and in combination with other energy dissipating devices for high volume discharges. A straw bale dewatering structure is shown In Detail 6. A dewatering filter bags may be sued as an alternative to show bale dewatering structures. A dewatering filter bag is shown in Detail 5.

Typical Drawing Index

Octain 20 Typical Road Bore Crossing Detail 21 Typical Road Bore Crossing Detail 22 Streambank Reclamation - Log Wall Detail 23 Streambank Reclamation - Vogetated Geotextile Installation Detail 24 Streambank Reclamation - Vogetated Geotextile Installation Detail 25 Typical ROW Loyout/Soil Handling Detail 26 Header/Main Crossovers of Pipeline Detail 28 Temporary Drain Tile Repair Detail 29 Permanent Repair Method of Drain Tiles Detail 30 Equipment Cleaning Station Detail Detail 31 Equipment Wash Station Detail Detail 67 Topsoil Conservation Ditch & Spoil Stripping Triple Ditch Detail 67A Topsoil Conservation Ditch & Spoil Stripping Triple Ditch Detail 1 The following typical drawings are included for ease of reference. . Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Image: Stream School 1 Image: Stream Date 1 Image: Stream Date 1 Image: Stream Date 1 Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Image: Stream Date 1 Image: Stream Date 1 Image: Stream Date 1 Image: Stream Date 1 <th>03 2010-10-11 REVISED TITLE BLOCK</th> <th>Detail 1 Detail 2 Detail 3 Detail 4 Detail 5 Detail 6 Detail 7 Detail 8 Detail 9 Detail 10 Detail 11 Detail 12 Detail 12 Detail 13a Detail 13a Detail 14 Detail 14a Detail 15 Detail 16 Detail 17 Detail 18 Detail 18 Detail 19 Detail 20</th> <th>Typical Silt Typical Str Temporary Erosion Cc Typical De Typical Str Typical Str Typical Str Typical Pe "Dry" Wetta Standard V Push/Pull V Typical Op Typical Op Typical Op Typical Dry Typical Dry Typical Da Typical Da Typical Ten Typical Ten Typical Fel Typical Ra Typical Ra Flexible Ch</th> <th>Fence Barrier aw or Hay Bail B /Permanent Slop introl Matting Insi watering Filter Ba aw Bale Dewater rmanent Trench I and Crossing Me Vetland Crossing Netland Crossing en Cut Wet Cross en Cut Wet Cross en Cut Wet Cross of Flume Crossing / Flume Crossing m and Pump Cross m and Pump Cross m and Pump Cross mand Pump Cross in Contal Drill (HD mporary Bridge Cross ilcar Bridge Cross in Car Bridge Cross</th> <th>arrier be Breaker Detail tallation ag ring Structure Breakers thod Method sing Method Nor sing Method Flow sing Method Flow sing Method Flow Method - Const bessing D Site Plan & Pr Crossing Crossing - Construct sing sing - Constructed allation</th> <th>(Water Bars) n-Flowing Waterl wing Waterbody wing Waterbody ruction Procedures ofile uction Procedures on Procedures</th> <th>body - Construction Procedures res</th> <th></th> <th></th>	03 2010-10-11 REVISED TITLE BLOCK	Detail 1 Detail 2 Detail 3 Detail 4 Detail 5 Detail 6 Detail 7 Detail 8 Detail 9 Detail 10 Detail 11 Detail 12 Detail 12 Detail 13a Detail 13a Detail 14 Detail 14a Detail 15 Detail 16 Detail 17 Detail 18 Detail 18 Detail 19 Detail 20	Typical Silt Typical Str Temporary Erosion Cc Typical De Typical Str Typical Str Typical Str Typical Pe "Dry" Wetta Standard V Push/Pull V Typical Op Typical Op Typical Op Typical Dry Typical Dry Typical Da Typical Da Typical Ten Typical Ten Typical Fel Typical Ra Typical Ra Flexible Ch	Fence Barrier aw or Hay Bail B /Permanent Slop introl Matting Insi watering Filter Ba aw Bale Dewater rmanent Trench I and Crossing Me Vetland Crossing Netland Crossing en Cut Wet Cross en Cut Wet Cross en Cut Wet Cross of Flume Crossing / Flume Crossing m and Pump Cross m and Pump Cross m and Pump Cross mand Pump Cross in Contal Drill (HD mporary Bridge Cross ilcar Bridge Cross in Car Bridge Cross	arrier be Breaker Detail tallation ag ring Structure Breakers thod Method sing Method Nor sing Method Flow sing Method Flow sing Method Flow Method - Const bessing D Site Plan & Pr Crossing Crossing - Construct sing sing - Constructed allation	(Water Bars) n-Flowing Waterl wing Waterbody wing Waterbody ruction Procedures ofile uction Procedures on Procedures	body - Construction Procedures res		
NOTE: The following typical drawings are included for ease of reference. NOTE: The following typical drawings are included for ease of reference. • Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Energy Services Inc. Image: State of the following typical drawings are included for ease of reference. Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Image: State of the following typical drawings are included for ease of refere	02 2010-10-08 REVISED TITLES	Detail 20 Detail 21 Detail 22 Detail 23 Detail 24 Detail 25 Detail 26 Detail 27 Detail 28 Detail 29 Detail 30 Detail 31 Detail 67 Detail 67	Typical Ro Typical Ro Streamban Streamban Streamban Typical RC Header/Ma Relocate/R Temporary Permanent Equipment Equipment Topsoil Co Topsoil Co	ck Rip-Rap ad Bore Crossing k Reclamation - k Reclamation - k Reclamation - k Reclamation - W Layout/Soil H in Crossovers of eplace Drainage Prain Tile Repair Repair Method Cleaning Station Wash Station Dich nservation Ditch	Brush Layer in C Log Wall Vegetated Geote andling Pipeline Header/Main ir of Drain Tiles Detail etail & Spoil Stripping & Spoil Stripping	ross Cut Slope extile Installation			
Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation and Reclamation Plan Details 1 through 31 can be found in the Construction Mitigation Algorithm Plan Details 1 through 31 can be found in the Cons	2008-11-05 REVISED TITLES, ADDED/DEL. DETAILS	NOTE: T	he following	typical drawing	as are included	for ease of refe	rence.		
Image: Construction of the state of the	EVISIONS 01	• D	etails 1 throu	gh 31 can be fou	ind in the Constru	uction Mitigation	and Reclamation Plan		
In business to deliver In business to deliver JMP 2010–10–21 Title Discipline # Discipline # It: +1.850.385.5411 [f. +1.850.385.5523 JMP 2010–10–21 Title DETAIL INDEX Talkahassee, FL 32308 It: +1.850.385.5523 Design Checker: Scale Design Checker: WWW.exp.com WSF RW P7100 Scale N.T.S. DWG No 4359–03–ML-00–700 Rev	Ľ	() Trans	Canada	DESIGNER:			KEYSTONE XL PROJECT		"
exp Energy Services Inc. JMP 2010-10-21 TITLE t: +1.850.385.5441 f: +1.850.385.5523 MME DETAIL INDEX Tallahassee, FL 32308 CHECKED BY: DESIGN CHECKER: USA WSF RW P7100 SCALE N.T.S. DWG No 4359-03-ML-00-700		In busines	s to deliver			^{+IA} # 4359	CHAINAGE:	DISCIPLINE #	# 03
t: +1,850.385.5441 f: +1,850.385.5523 1300 Metropolitan BMd Tallahassee, FL 32308 USA WWW.exp.com Normanian State		exp Energy Ser	vices Inc.	JMP NAME	<u>2010-10-21</u>	TITLE			
Tallahassee, FL 32308 CHECKED BY: DESIGN CHECKER: USA www.exp.com	t: +1.850.385.5441 f: +1.850.385.5523 DET				DETAIL INDEX				
WWW.exp.com The rest density of The Digenerative Accel WSF RW P7100 SCALE N.T.S. DWG No 4359-03-ML-00-700 REV		Tallahassee, FL 32308 USA	[%] exp.	CHECKED BY:	DESIGN CHECKER:				
		www.exp.com	dentity of Trow Engineering Consultants, Inc.	WSF	RW _{P7100}	SCALE N.T.S.	DWG No 4359-03-ML-00-	·700	REV 03

TC_A4_BR.DWG 8.5X11

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS









CADD DRAWING: DO NOT MAKE MANUAL REVISIONS









CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

(CONSTRUCTION R.O.W.						
	FABRICATED PIPE STRING						
D-11 UPDATED DRAWING NOTES	A A SIDEBOOM A SIDEBOOM CONSTRUCTION R.O.W.						
10-1							
3 20	SPOIL						
0 S	€ PIPELINE						
NOTE	<u>Plan view</u>						
MING	CONSTRUCTION PROCEDURES:						
DRA	1 IE THE WETLAND IS REINC CUI TIVATED AND FARMED NO WETLAND CONSTRUCTION PROCEDURES ARE						
ATED	REQUIRED.						
-10-08 UPD	 FLAG WETLAND BOUNDARIES PRIOR TO CLEARING. NO REFUELING OF MOBILE EQUIPMENT IS ALLOWED WITHIN 100 FEET OF WETLAND. PLACE "NO FUELING" SIGN POSTS APPROXIMATELY 100 FEET BACK FROM WETLAND BOUNDARY. REFUEL STATIONARY EQUIPMENT AS PER THE PROJECT'S SPILL PREVENTION PROCEDURES. 						
2010-	4. INSTALL TEMPORARY SLOPE BREAKER OPSLOPE WITHIN TOO FEET OF WEILAND BOUNDARY IF DIRECTED BY THE PROJECT.						
02	5. DO NOT TRENCH WETLAND UNTIL PIPE IS READY TO INSTALL. 6. CONSTRUCT WHEN DRY, IF POSSIBLE. IF SITE BECOMES WET AT TIME OF TRENCHING, AVOID SOIL						
	COMPACTION BY UTILIZING TIMBER RIP-RAP OR PREFABRICATED EQUIPMENT MATS. 7 AVOID ADJACENT WETLANDS INSTALL SEDIMENT BARRIERS (STRAW BALES AND/OR SILT FENCE) AT						
	DOWN SLOPE EDGE OF RIGHT-OF-WAY ALONG WETLAND EDGE IF NEEDED TO CONTAIN SPOIL WITHIN						
	8. RESTRICT ROOT GRUBBING TO ONLY THAT AREA OVER THE DITCHLINE AND REMOVE STUMPS FROM						
& 4	9. CONDUCT TRENCH LINE TOPSOIL STRIPPING (IF TOPSOIL IS NOT SATURATED). SALVAGE TOPSOIL TO						
S 3	ACTUAL DEPTH OR A MAXIMUM DEPTH OF 12 INCHES. 10. TRENCH THROUGH WETLANDS.						
NOTE	11. PIPE SECTION TO BE FABRICATED WITHIN THE WETLAND AND ADJACENT TO ALIGNMENT, OR IN STAGING AREA OUTSIDE THE WETLAND AND WALKED IN.						
VISED	12. LOWER-IN PIPE. PRIOR TO BACKFILLING TRENCH, IF REQUIRED, TRENCH PLUGS SHALL BE INSTALLED AS REQUIRED. BACKFILL TRENCH.						
LE KE	13. RESTORE GRADE TO NEAR PRE-CONSTRUCTION TOPOGRAPHY, REPLACE TOPSOIL AND INSTALL						
S 01	14. IF UTILIZED, REMOVE TIMBER MATS OR PRE-FABRICATED MATS FROM WETLANDS UPON COMPLETION.						
ISION	DIRECTED BY KEYSTONE.						
REV	DESIGNER: KEYSTONE XL PROJECT						
-	FIA # 4359 CHAINAGE: DISCIPLINE # 03						
	exp Energy Services Inc. JMP 2010-10-21 TITLE DETAIL 8						
	1300 Metropolitan Blvd Tallahassee, FL 32008 CHECKED BY: DESIGN CHECKEP: "DRY" WETLAND CROSSING METHOD						
	WSA CALE N T S DWG No 4359-03-MI -03-701 REV						
	TC_A4_BR.DWG 8.5X11 CADD DRAWING: DO NOT MAKE MANUAL REVISIONS						








TC_A4_BR.DWG 8.5X11

	CON	STRUCTION PROCEDURES:
	1.	RIGHT-OF-WAY BOUNDARIES AND WORK SPACE LIMITS SHALL BE CLEARLY DELINEATED. STAGING FOR MAKEUP SHALL BE LOCATED A MINIMUM OF 10 FEET FROM WATERBODY.
	2.	CLEARING LIMITS WILL BE CLEARLY DELINEATED AND 10 FOOT VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREA AND THE WATERBODY SHALL BE MAINTAINED TO THE EXTENT POSSIBLE. ALL CLEARING SHALL BE MINIMIZED TO THE EXTENT POSSIBLE AND TO ONLY THAT NECESSARY FOR CONSTRUCTION. WOODY VEGETATION SHALL BE CUT AT GROUND LEVEL AND THE STUMPS/ROOTS LEFT IN PLACE TO THE EXTENT POSSIBLE.
	3.	TOPSOIL SHALL BE STRIPPED FROM THE DITCH LINE IN ALL WETLANDS RIPARIAN.
	4.	CONTRACTOR SHALL INSTALL SIGNS APPROXIMATELY 100 FEET MINIMUM FROM EACH WATERBODY AND WETLAND TO IDENTIFY THE HAZARDOUS MATERIALS EXCLUSION AREA.
	5.	EROSION AND SEDIMENT CONTROL a. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED OR ALONG DOWN GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS WATERBODY OR WETLAND.
		b. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY OR INDIRECTLY INTO THE WATERBODY. ALL EROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO SUIT ACTUAL SITE CONDITIONS. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE ACCESS DURING CONSTRUCTION.
		c. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED CONSTRUCTION RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE.
		d. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE WATERBODY CROSSING UNTIL THE WATER CROSSING IS INSTALLED AND BACKFILLED.
		e. TRENCH BREAKERS ARE TO BE INSTALLED AT THE SAME SPACING AND IMMEDIATELY UPSLOPE OF PERMANENT SLOPE BREAKERS, OR AS DIRECTED BY THE COMPANY.
	6.	CONTRACTOR SHALL MAINTAIN HARD PLUGS IN THE DITCH AT THE WATERBODY UNTIL JUST PRIOR TO PIPE INSTALLATION. CONTRACTOR SHALL EXCAVATE TRENCH AND INSTALL PIPE AS EXPEDIENTLY AS PRACTICAL TO REDUCE THE DURATION OF WORK ACTIVITIES IN THE WATERBODY BED.
¥	7.	CONTRACTOR SHALL PLACE TRENCH SPOIL ONLY IN CERTIFICATED WORK SPACE AND A MINIMUM OF 10 FEET FROM THE WATERBODY BANKS TO PREVENT ENTRY OF SPOIL INTO THE WATERBODY. SPOIL SHALL BE CONTAINED AS NECESSARY USING EITHER A STRAW BALE BARRIER OR AN EARTH/ROCK BERM.
0-11 REVISED TITLE BLOC	8.	CONTRACTOR SHALL RESTORE THE WATERBODY AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, UNLESS OTHERWISE APPROVED BY THE COMPANY. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED. ANY MATERIALS PLACED IN THE WATERBODY TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING. MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATERBODY AND WETLAND BOUNDARIES UNTIL VEGETATION IS ESTABLISHED IN ADJACENT DISTURBED AREAS.
2010-1	9.	VEHICLE CROSSING CAN BE CONSTRUCTED USING EITHER A FLUME CROSSING OR A TEMPORARY BRIDGE. VEHICLE CROSSING ONLY REQUIRED IF STREAM SUPPORTS A STATE DESIGNATED FISHERY.
EVISIONS 01		
Ľ	()	TransCanada FIA # 4359 CHAINAGE: DISCIPLINE # 03
	exp E t: +1.850 1300 Me Tallahas USA	In business to deliver Energy Services Inc. D.385.5441 [f:+1.850.385.5523 atropolltan Bivd assee, FL 32308 CHECKED BY: DESIGN CHECKER: DESIGN CHECKER: DE
	(www.ex	$\frac{1}{10000000000000000000000000000000000$



	<u>CON</u>	STRUCTION PROCEDURES	<u>):</u>					
	1.	MARK OUT AND MAINT, UNNECESSARY DISTURE BRIEFED ABOUT THIS F	AIN LIMITS OF AU BANCE OF VEGET PLAN AND THE M	JTHORIZED WORK ATION. ENSURE E EASURE NEEDED	AREAS WITH FEN QUIPMENT OPERA TO PROTECT WA	NCING OR FLAGGING TAPE TO NTORS WORKING ON THE CROS TER QUALITY.	AVOID SING HAVE BEEN	1
	2.	COMMENCING IN-WATER	MENT AND MATE R WORK.	RIALS TO BUILD	THE FLUME MUST	BE ON-SITE OR READILY AV	AILABLE PRIOR I	0
	3.	TO THE EXTENT POSSIE WATERCOURSE INSTALL	3LE, MAINTAIN A	MINIMUM 10 FT.	VEGETATIVE BUF	FER STRIP BETWEEN DISTURBE BARRIER UPSLOPE OF THE BUE	D AREAS AND THE FER STRIP ON	HE
		EACH SIDE OF THE WA	TERCOURSE.	A SIET TENCE O				
	4.	GRADIENT SIDES OF WO	JPPLY, INSTALL . Ork arfas and	AND MAINTAIN SI STAGING ARFAS	EDIMENT CONTROL	_ STRUCTURES, AS DEPICTED + HEAVILY SILT LADEN WATER F	OR ALONG DOWN NTERS STREAM	
		a. NO HEAVILY SILT	LADEN WATER S	HALL BE DISCHA	RGED DIRECTLY IN	NTO THE STREAM.		
		b. EROSION AND SEL BE ADJUSTED AS	DIRECTED BY TH	E COMPANY INS	PECTOR TO ACTU	AL SITE CONDITIONS.	MAY	
		c. SILT FENCE OR S	TRAW BALE INST	ALLATIONS SHALL	INCLUDE REMOV	ABLE SECTIONS TO FACILITATE	Ē	
		WHERE FREQUENT	ACCESS IS REQ	UIRED.	ALL DARRENS ON	ILT IN LIEU OF A SILT FLINGL		
		d. SEDIMENT LADEN UPLAND AREA IN1	WATER FROM TR TO A STRAW BAL	ENCH DEWATERIN E DEWATERING S	IG SHALL BE DISC Structure or ge	CHARGED TO A WELL VEGETAT FOTEXTILE FILTER BAG.	ED	
		e. SEDIMENT CONTRO)L STRUCTURES	MUST BE IN PLA	CE AT ALL TIMES	ACROSS THE DISTURBED		
		f. SOFT DITCH PLUG	. RIGHT-OF-WAY S MUST REMAIN	IN PLACE AT CC	NVENIENT LOCATI	INS TO SEPARATE MAINLINE	DITCH	
	5	FROM THE RIVER	CROSSING UNTIL	THE RIVER CROS	SSING IS INSTALLE	ED AND BACKFILLED.		
	5. 6.	FLUME CAPACITY DURIN	NG DRY CROSSIN	G SHALL BE SUF	FICIENT TO ACCO	MMODATE 1.5 TIMES THE FLO	W MEASURED	
		AT THE TIME OF CONS PRECIPITATION IS FORE	TRUCTION PROVIE	DED THAT THE FI	LUMES WILL BE IN IICLE ACCESS SHA	N PLACE NOT MORE THAN 96 ALL BE SUFFICIENT TO PASS T	HOURS AND NO THE 2 YEAR DES	IGN
		FLOW OR THE FLOW RE	ASONABLY EXPE	CTED TO OCCUR	DURING THE INS	TALLATION. EXCESS FLUMES R	EQUIRED FOR	
	7.	ENSURE THAT THE DAM	VIS AND VEHICLE	CROSSING ARE	LOCATED FAR EN	OUGH APART TO ALLOW FOR	A WIDE	
	8	EXCAVATION.			AMETER BELOW S	STREAMRED LEVEL WHERE SOIL		
	0.	PERMIT (OTHERWISE IN:	STALLED AT STR	EAM GRADE AND	SLOPE.)	SINCAMBED LEVEL WHENE SOIL		
	9.	PLACE IMPERVIOUS DAT	VIS AT EACH ENE GRAVEL WITH E	O OF THE FLUME	, UPSTREAM FIRS TION SAND BAGS	T, THEN DOWNSTREAM. ACCEP	TABLE	
		INSTALLATION, INSTALL	AN IMPERVIOUS	MEMBRANE, IF N	NECESSARY, TO L	IMIT LEAKAGE. DAMS MAY NEE	D KEYING INTO	THE
Х		EXCAVATE TRENCH THE	Rough plugs af	ND UNDER FLUME	FROM BOTH SID	ES. WORK IS TO BE COMPLET	ED AS QUICKLY A	AS
BLO		POSSIBLE.	Y PASSING LINDE	R FLUME AND R.		ELY WITH SPOIL MATERIAL		
ITLE		b. IT IS NOT NECESS	SARY TO DEWATE	R THE IN-STREA	M TRENCH, HOWE	EVER, DISPLACED WATER SHAL	L	
Π		c. IF THE SPOIL MAT	IABLE UPLANL FERIAL IS NOT SI	JITABLE, USE IMF	PORTED CLEAN GR	RANULAR MATERIAL.	IENT.	
EVISE		d. IF BLASTING IS RE	EQUIRED, USE CO	NTROLLED BLAS	TING TECHNIQUES	TO PREVENT DAMAGE TO THE	-	
1 RE	4.0	FLUME INSTALLATI	ION BY DRILLING	THROUGH THE C	VERBURDEN.			
10-1	10.	CONTAINED TO PREVEN	IT SATURATED S	DIL FROM FLOWIN	G BACK INTO THE	WATERCOURSE. THIS MATERIA E WATERCOURSE.	L SHALL BE	
- 10-	11.	DEWATERING OF THE O	NLAND TRENCH	SHOULD OCCUR I	N A STABLE VEG	ETATED AREA A MINIMUM OF	50 FT. FROM AN	IY
20		TIMBERS TO PREVENT I	LOCALIZED EROS	ION. THE DISCHA	RGE WATER SHOU	ILD ALSO BE FORCED INTO SH	EET FLOW	
02	12.	FLUMES SHOULD BE RE	EMOVED AS SOOM	N AS POSSIBLE,	WHEN NO LONGER	R REQUIRED FOR PIPE LAYING	OR FOR ROAD	
		ACCESS, IN THE FOLLO	WING MANNER:	AMP BANKS AR	F TO BE RESTOR	ED TO A STABLE ANGLE AND		
		PROTECTED WITH	EROSION RESIST	ANT MATERIAL CO	OMPATIBLE WITH	THE FLOW CONDITIONS (E.G.,		
		EROSION CONTROL BEFORE REMOVING	_ BLANKETS, CRU 3 THE DAMS.	BBING, ROCK RIP	-RAP, ETC.) TO	THE MAXIMUM EXTENT POSSIB	LE	
		b. REMOVE DOWNSTR	EAM DAM.					
		d. REMOVE FLUME.						
		e. COMPLETE BANK PLACE AND REMO	irimming and EI IVE BY HAND TO	AVOID EQUIPMEN	IUN. IF SANDBAGS NT BREAKING BAG	S ARE USED FOR THE DAMS, S.		
ШЦ	13.	RESTORE THE STREAME	BED AND BANKS	TO APPROXIMAT	E PRE-CONSTRUC	CTION CONTOURS, BUT NOT TO	EXCEED 2	
E Q		a. INSTALL PERMANE	INT EROSION AND	SEDIMENT CON	TROL STRUCTURES	S AS INDICATED ON A SITE		
VISE		SPECIFIC BASIS. II AS NAG C125 OR	N THE ABSENCE C350 WHICH IS	OF SITE SPECIFIC	C INFORMATION, A Thstanding antic	A FLEXIBLE CHANNEL LINER SU CIPATED FLOW SHALL BE	JCH	
RE		INSTALLED. ALTER	NATIVELY, ROCK	RIP-RAP SHALL	BE INSTALLED.		NC	
6		RESTORATION. BA	NKS SHALL BE S	TABILIZED AND	TEMPORARY SEDIM	MENT BARRIERS INSTALLED AS		
SNC		C. MAINTAIN A SILT	LE AFIER CROSS	W BALE BARRIER	24 HOURS OF CO ALONG THE WAT	JMPLETING THE CROSSING. ER COURSE UNTIL VEGETATION	I IS	
VISIO		ESTABLISHED IN A	ADJACENT DISTUR	RBED AREAS.				
RE	6	TransCanada	DESIGNER:			KEYSTONE XL PROJECT		
		In business to deliver			^{FIA} # 4359	CHAINAGE:	DISCIPLINE #	03
	exp	Energy Services Inc.	JMP NAME	<u>2010–10–21</u>	TITLE	DETAIL 13A		
	t: +1.8 1300	850.385.5441 f. +1.850.385.5523 Metropolitan Bivd			TYPIC	AL DRY FLUME CROSSING	METHOD -	
	Tallał USA	nassee, FL 32308 CXP.	CHECKED BY:	DESIGN CHECKER:				
l	~~~~	exp.com The new identity of Traw Engineering Consultants, Inc.	WSF	RW _{P7100}	N.T.S.	4359-03-ML-03	-708	^{-v} 02
		TC_A4_BR.DWG 8.5X11	CADD D	RAWING: DO NO	DT MAKE MANUA	AL REVISIONS		



CONSTRUCTION PROCEDURES: WHERE NECESSARY, OBTAIN PRIOR APPROVAL BEFORE USING THE DAM AND PUMP METHOD. IF THERE IS ANY FLOW IN THE WATERCOURSE, INSTALL PUMPS TO MAINTAIN STREAMFLOW AROUND THE BLOCKED OFF SECTIONS OF CHANNEL. THE PUMP IS TO HAVE 1.5 TIMES THE PUMPING CAPACITY OF ANTICIPATED FLOW. A SECOND STANDBY PUMP OF EQUAL CAPACITY IS TO BE READILY AVAILABLE AT ALL TIMES. AN ENERGY DISSIPATER IS TO BE 1 2. BUILT TO ACCEPT PUMP DISCHARGE WITHOUT STREAMBED OR STREAMBANK EROSION. IF THE CROSSING IS PROLONGED BEYOND ONE DAY THE OPERATION NEEDS TO BE MONITORED OVERNIGHT. SCHEDULE INSTREAM ACTIVITY FOR LOW FLOW PERIODS IF POSSIBLE. .3 MARK OUT AND MAINTAIN LIMITS OF AUTHORIZED WORK AREAS WITH FENCING OR FLAGGING TAPE TO AVOID UNNECESSARY DISTURBANCE OF VEGETATION. ENSURE EQUIPMENT OPERATORS WORKING ON THE CROSSING HAVE BEEN BRIEFED ABOUT THIS PLAN AND THE MEASURES NEEDED TO PROTECT WATER QUALITY. INSTALL PRE-WORK SEDIMENT CONTROL MEASURES AS SPECIFIED IN THE PLAN. ALL NECESSARY EQUIPMENT AND MATERIALS TO BUILD THE DAMS AND TO PUMP WATER MUST BE ON SITE OR READILY AVAILABLE PRIOR TO COMMENCING IN-WATER CONSTRUCTION. PIPE SHOULD BE STRUNG, WELDED AND COATED AND READY FOR INSTALLATION PRIOR TO WATERCOURSE TRENCHING. CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES, AS DEPICTED AND ALONG DOWN 5. GRADIENT SIDES OF WORK AREAS AND STAGING AREAS SUCH THAT NO HEAVILY SILT LADEN WATER ENTERS STREAM. NO HEAVILY SILT LADEN WATER SHALL BE DISCHARGED DIRECTLY INTO THE STREAM. а BEROSION AND SEDIMENT CONTROL STRUCTURE LOCATIONS AS DEPICTED ARE APPROXIMATE AND MAY BE ADJUSTED AS DIRECTED BY THE COMPANY INSPECTOR TO ACTUAL SITE CONDITIONS. SILT FENCE OR STRAW BALE INSTALLATIONS SHALL INCLUDE REMOVABLE SECTIONS TO FACILITATE b. с. ACCESS DURING CONSTRUCTION. UTILIZE STRAW BALE BARRIERS ONLY IN LIEU OF A SILT FENCE WHERE FREQUENT ACCESS IS REQUIRED. d. SEDIMENT LADEN WATER FROM TRENCH DEWATERING SHALL BE DISCHARGED TO A WELL VEGETATED UPLAND AREA INTO A STRAW BALE DEWATERING STRUCTURE OR GEOTEXTILE FILTER BAG. SEDIMENT CONTROL STRUCTURES MUST BE IN PLACE AT ALL TIMES ACROSS THE DISTURBED e. PORTIONS OF THE RIGHT-OF-WAY EXCEPT DURING EXCAVATION/INSTALLATION OF THE CROSSING PIPE. SOFT DITCH PLUGS MUST REMAIN IN PLACE AT CONVENIENT LOCATIONS TO SEPARATE MAINLINE DITCH FROM THE RIVER CROSSING UNTIL THE RIVER CROSSING IS INSTALLED AND BACKFILLED. f. TO THE EXTERT POSSIBLE, MAINTAIN A MINIMUM 10 FEET VEGETATIVE BUFFER STRIP BETWEEN DISTURBED AREAS AND THE WATERCOURSE. INSTALL AND MAINTAIN A SILT FENCE UPSLOPE OF THE BUFFER STRIP ON EACH SIDE OF THE WATERCOURSE. THE SILT FENCE SHOULD INCORPORATE REMOVABLE "GATES" AS REQUIRED TO ALLOW ACCESS WHILE 6. MAINTAINING EASE OF REPLACEMENT FOR OVERNIGHT OR DURING PERIODS OF RAINFALL. CONSTRUCT A TEMPORARY SUMP UPSTREAM OF THE DAM AND LINE WITH ROCKFILL IF A NATURAL POOL DOES NOT 7. EXIST. INSTALL THE PUMP OR PUMP INTAKE IN THE POOL OR SUMP. DISCHARGE WATER ONTO AN ENERGY DISSIPATER DOWNSTREAM OF THE WORK AREA. EXCAVATED MATERIAL MUST NOT BE STOCKPILED WITHIN 10 FT. OF THE WATERCOURSE. THIS MATERIAL MUST BE CONTAINED WITHIN BERM CONTAINMENT, WITH SECONDARY SILT FENCE PROTECTION TO PREVENT SATURATED SOIL FROM FLOWING BACK INTO THE WATERCOURSE. BLOCK CHEMICALS, FUELS, LUBRICATING OILS SHALL NOT BE STORED AND EQUIPMENT REFUELED WITHIN 100 FT. OF THE WATERBODY. PUMPS ARE TO BE REFUELED AS PER THE SPCC PLANS. TITLE 10. STAGING AREAS ARE TO BE LOCATED AT LEAST 10 FT. FROM THE WATER'S EDGE (WHERE TOPOGRAPHIC CONDITIONS PERMIT) AND SHALL BE THE MINIMUM SIZE NEEDED. REVISED 11. DAMS ARE TO BE MADE OF STEEL PLATE, INFLATABLE PLASTIC DAM, SAND BAGS, COBBLES, WELL GRADED COARSE GRAVEL FILL, OR ROCK FILL. DAMS MAY NEED KEYING INTO THE BANKS AND STREAMBED. ENSURE THAT THE DAM AND VEHICLE CROSSING ARE LOCATED FAR ENOUGH APART TO ALLOW FOR A WIDE EXCAVATION. CAP FLUMES USED UNDER VEHICLE CROSSING DURING DRY CROSSING. 2010-10-11 12. DEWATER AREA BETWEEN DAMS IF POSSIBLE. DEWATERING SHOULD OCCUR IN A STABLE VEGETATIVE AREA A MINIMUM OF 50 FT. FROM ANY WATERBODY. THE PUMP DISCHARGE SHOULD BE DISCHARGED ONTO A STABLE SPILL PAD CONSTRUCTED OF ROCKFILL SANDBAGS, OR TIMBERS TO PREVENT LOCALIZED EROSION. THE DISCHARGE WATER SHOULD ALSO BE FORCED INTO SHEET FLOW IMMEDIATELY BEYOND THE SPILL PAD BY USING STRAW BALES AND THE NATURAL TOPOGRAPHY DISCHARGED WATER SHALL NOT BE ALLOWED TO FLOW INTO ANY WATERCOURSE OR WETLAND. IF IT IS NOT POSSIBLE TO DEWATER THE EXCAVATION DUE TO SOILS WITH A HIGH HYDRAULIC CONDUCTIVITY, THE EXCAVATION 2 AND PIPE PLACEMENT IS TO BE CARRIED OUT IN THE STANDING WATER. PUMP ANY DISPLACED WATER AS DESCRIBED ABOVE TO PREVENT OVERTOPPING OF DAMS. 13. EXCAVATE TRENCH THROUGH PLUGS AND STREAMBED FROM BOTH SIDES, RE-POSITIONING DISCHARGE HOSE AS NECESSARY. LOWER THE PIPE IN THE TRENCH AND BACKFILL IMMEDIATELY. DURING THIS OPERATION WORK IS TO BE COMPLETED AS QUICKLY AS POSSIBLE. 14. CONTRACTOR SHALL RESTORE THE STREAM BED AND BANKS TO APPROXIMATE PRE-CONSTRUCTION CONTOURS, BUT NOT TO EXCEED 2 HORIZONTAL TO 1 VERTICAL. CONTRACTOR SHALL INSTALL PERMANENT EROSION AND SEDIMENT CONTROL STRUCTURES AS INDICATED ON A SITE SPECIFIC BASIS. IN THE ABSENCE OF SITE SPECIFIC INFORMATION, A FLEXIBLE CHANNEL LINER SUCH AS NAG C125 OR C350 WHICH IS CAPABLE OF WITHSTANDING ANTICIPATED FLOW SHALL BE INSTALLED. а. ALTERNATIVELY, ROCK RIP-RAP SHALL BE INSTALLED. ANY MATERIALS PLACED IN THE STREAM TO FACILITATE CONSTRUCTION SHALL BE REMOVED DURING b. Π RESTORATION. BANKS SHALL BE STABILIZED AND TEMPORARY SEDIMENT BARRIERS INSTALLED AS SOON AS POSSIBLE AFTER CROSSING, BUT WITHIN 24 HOURS OF COMPLETING THE CROSSING. REVISED MAINTAIN A SILT FENCE OR STRAW BALE BARRIER ALONG THE WATER COURSE UNTIL VEGETATION IS c. ESTABLISHED IN ADJACENT DISTURBED AREAS. 15. WHEN THE STREAMBED HAS BEEN RESTORED, THE CREEK BANKS ARE TO BE CONTOURED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH FLOW VELOCITY BETWEEN DAMS (E.G., EROSION 5 CONTROL BLANKETS, CRIBBING, ROCK RIP-RAP, ETC.). THE DAMS ARE TO BE REMOVED DOWNSTREAM FIRST. KEEP PUMP RUNNING UNTIL NORMAL FLOW IS RESUMED. COMPLETE BANK TRIMMING AND EROSION PROTECTION. IF SANDBAGS REVISIONS ARE USED FOR THE DAMS, PLACE AND REMOVE BY HAND TO AVOID EQUIPMENT BREAKING BAGS. **DESIGNER:** KEYSTONE XL PROJECT **Trans**Canada FIA # 4359 CHAINAGE: DISCIPLINE # In business to deliver 2010-10-21 TITI F JMP exp Energy Services Inc. DETAIL 14A t: +1.850.385.5441 | f: +1.850.385.5523 TYPICAL DAM AND PUMP CROSSING -Tallahassee, FL 32308 CONSTRUCTION PROCEDURES CHECKED BY: DESIGN CHECKER

$\nabla A \nabla_{\bullet}$		DEGIGIN GINEGINE			
ser Engineering Genzuftente, Inc.	WSF	RW P710	SCALE N.T	.S. DWG	[№] 4359-03-ML-03-710
8.5X11	CADD D	RAWING: DO I	NOT MAKE N	MANUAL RE	EVISIONS

USA

www.exp.com

TC_A4_BR.DWG

03

REV 02





CONSTRUCTION PROCEDURES:

IN GENERAL TERMS, THE FOLLOWING IS A SEQUENCE OF CONSTRUCTION PROCEDURES THAT ARE RECOMMENDED TO BE FOLLOWED FOR TEMPORARY BRIDGE CROSSINGS:

- 1. A PORTABLE BRIDGE, FLEXI-FLOAT OR FLUMED VEHICLE CROSSING MAY BE SUBSTITUTED FOR THE TEMPORARY BRIDGE. IT IS IMPORTANT THAT THE SIZE OF THE TOTAL OPENING BE SELECTED SO THE STRUCTURE CAN SAFELY PASS FLOOD FLOWS THAT CAN REASONABLY BE EXPECTED TO OCCUR DURING THE LIFE OF THE CROSSING.
- 2. DETERMINE BRIDGE LENGTH REQUIRED AND FOLLOW EITHER METHOD A) OR B) FOR DETERMINING THE OPENING SIZE. IF A) IS FOLLOWED, A MINIMUM 6.5 FT. SETBACK FROM TOP OF BANK MUST BE PRESERVED AS A "NO DISTURBANCE AREA". IF ABUTMENTS OR PIERS IN THE STREAMBED ARE REQUIRED, METHOD B) IS TO BE FOLLOWED.
- 3. INSTALL THE BRIDGE IN A MANNER THAT WILL MINIMIZE SEDIMENT ENTERING THE WATER. STRINGERS MUST BE DESIGNED TO SUPPORT THE LOADS EXPECTED ON THE BRIDGE. CURBS MUST BE INSTALLED ALONG THE EDGE OF THE DECK TO CONTAIN SEDIMENT AND DEBRIS ON THE BRIDGE. FASTENERS CONNECTING COMPONENTS MUST BE STRONG ENOUGH TO HOLD THEM IN POSITION DURING THE LIFE OF THE BRIDGE. CRIBS ARE TO BE FILLED WITH ROCK OR COBBLE. RIP-RAP EROSION PROTECTION IS TO BE PLACED AROUND THE CRIBS AND ON ANY FILL SLOPES PROJECTING INTO THE WATERBODY.
- 4. ROAD APPROACHES LEADING TO THE BRIDGE MUST BE RAISED AND STABLE SO EQUIPMENT LOADS ARE SUPPORTED A SUFFICIENT DISTANCE BACK FROM THE WATER TO REDUCE SEDIMENT AND DEBRIS ENTERING THE WATERBODY FROM EQUIPMENT TRACKS. THIS MAY REQUIRE USING MATERIALS SUCH AS GRAVEL, ROCK OR CORDUROY. DO NOT USE SOIL TO CONSTRUCT OR STABILIZE EQUIPMENT BRIDGES. IF CUTS ARE NEEDED TO OBTAIN A SATISFACTORY GRADE, THEY ARE TO BE DUG WITH SIDE DITCHES AND STABLE SLOPES. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED TO KEEP SEDIMENT ON LAND (E.G., SILT FENCING, FILTER CLOTH, RIP-RAP, SEED AND MULCH, ETC.)
- 5. MAINTAIN A SILT FENCE ON EACH SIDE OF THE WATERBODY EXTENDING A MINIMUM OF 10 FEET BEYOND THE WIDTH OF DISTURBANCE UNTIL VEGETATION HAS BEEN ESTABLISHED IN UPSLOPE AREAS.
- 6. PERIODICALLY CHECK BRIDGE INSTALLATION AND REMOVE ANY BUILD-UP OF SEDIMENT OR DEBRIS ON THE BRIDGE. DISPOSE OF THIS MATERIAL IN A LOW LYING AREA AT LEAST 100 FEET FROM THE WATERBODY.
- 7. REMOVE TEMPORARY CROSSINGS AS SOON AS POSSIBLE AFTER FINAL CLEAN-UP. MATERIALS PLACED ALONG THE WATERBODY SHOULD BE COMPLETELY REMOVED DURING FINAL CLEAN-UP. REMOVAL SHOULD NOT OCCUR OUTSIDE THE CONSTRUCTION WINDOWS. SURPLUS GRAVEL IS TO BE SPREAD ON THE RIGHT-OF-WAY AS GRAVEL SHEETING, IF GRADATION IS SUITABLE, OR MOVED AT LEAST 100 FEET FROM TOP OF BANK FOR DISPOSAL. BRIDGE MATERIALS ARE TO BE REMOVED FROM THE CROSSING AREA. THE WATERBODY BED AND BANKS ARE TO BE RESTORED TO A STABLE ANGLE AND PROTECTED WITH EROSION RESISTANT MATERIAL COMPATIBLE WITH THE EXPECTED FLOW CONDITIONS.

VISIONS									
Ы К	() TransCanada	DESIGNER:				KEYSTONE	XL PROJECT		
	Iranscanada In business to deliver			FIA #	4359	CHAINAGE:		DISCIPLINE #	03
	exp Energy Services Inc. t: +1.850.385.5441 f: +1.850.385.5523 1300 Metropolitan Bivd Tallahassee, FL 32308	JMP name CHECKED BY:	2010-10-21 DATE	TITLE	TYPIC	DETA CAL TEMPORARY CONSTRUCTION	IL 16A ' BRIDGE CRO N PROCEDUR	OSSING — ES	
	www.exp.com	WSF	RW _{P7100}	SCALE	N.T.S.	DWG № 4359-	03-ML-03-	·713	REV 01

TC_A4_BR.DWG 8.5X11

5



TC_A4_BR.DWG 8.5X11

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS



THESE ARE TYPICAL DRAWINGS; ACTUAL	SITE CONDITIONS MAY VARY FRO	OM THE SITE GRAPHICALLY REPRESENTED

	CONSTR	UCTION PROCEDURES:	
	1. TH CR	IIS TYPICAL DRAWING PROVID Rossing.	ES FOR A RAILCAR BRIDGE EQUIPMENT
	2. BR BA	RIDGE SHOULD BE A MINIMUM	OF 12 FEET LONGER THAN BANK TO
	3. BE SU SE ON	ST MANAGEMENT PRACTICES ICH AS HAY BALES AND SIL DIMENTATION OF THE STREA THE STREAM BANKS.	UTILIZING EROSION CONTROL DEVICES, T FENCE ARE REQUIRED TO PREVENT M. EROSION PROTECTION SHALL BE PLACED
	4. DU AS AN WI [−] STI TEI CO TH BA	JRING FINAL CLEAN-UP, REM SOON AS POSSIBLE. INSTAL D SILT FENCE MUST BE REM TH STATE AND LOCAL REGUL REAMBED, BANKS AND AREA MPORARY EQUIPMENT CROSS NDITION. IF REQUIRED TO PH IE STREAM, SILT FENCE SHO ANKS.	OVE TEMPORARY EQUIPMENT CROSSINGS LED MATERIALS, SUCH AS HAY BALES MOVED AND DISPOSED IN ACCORDANCE LATIONS AND REQUIREMENTS. THE AS AFFECTED BY CONSTRUCTION OF THE SING SHOULD BE RESTORED TO A STABLE REVENT TRANSPORT OF SEDIMENTATION TO JLD BE INSTALLED AT THE TOP OF THE
2010-10-11 REVISED TITLE BLOCK			
10 SNC			
REVISI		DESIGNER:	
-	() TransCanada		FIA # 4359 CHAINAGE: DISCIPLINE # 03
	exp Energy Services Inc.	JMP 2010-10-2 NAME 2010-10-2	1 TITLE DETAIL 18A TYPICAL RAILCAR BRIDGE CROSSING -
	Tallahassee, FL 32308	CHECKED BY: DESIGN CHECKER	
	www.exp.com	WSF RW P710	10^{SCALL} N.T.S. 10^{WG} No 4359-03-ML-03-716 10^{REV} 01
	TC_A4_BR.DWG 8.5X11	CADD DRAWING: DO N	IOT MAKE MANUAL REVISIONS

/

OCK	SOR SOR MIT OF DISTURBANCE MIT OF DISTURBANCE MIT OF DISTURBANCE MIT OF DISTURBANCE MIT OF DISTURBANCE MIT OF DISTURBANCE MIT OF DISTURBANCE
2010-10-11 REVISED TITLE BLC	CHANNEL LINER
11/15/15/15/15/15/15/15/15/15/15/15/15/1	 NOTES: INSTALL AND ANCHOR LINERS FOLLOWING MANUFACTURER'S INSTRUCTIONS. PREPARE SOIL BEFORE INSTALLING CHANNEL LINER, INCLUDING THE APPLICATION OF SEED. CHANNEL LINERS SHOULD EXTEND COMPLETELY ACROSS DISTURBED BANK AREAS TO PROTECT ERODIBLE SURFACES. BEGIN AT THE END OF THE CHANNEL BY ANCHORING THE LINER IN A TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. ROLL LINER IN DIRECTION OF WATER FLOW. INSTALL LINERS END-OVER-END (SHINGLE STYLE) WITH OVERLAP USING A DOUBLE ROW OF STAGGERED STAPLES 4 INCHES BELOW THE FIRST ROW IN A STAGGERED PATTERN. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FEET INTERVALS. USE A ROW OF STAPLES 4 INCHES BELOW THE FIRST ROW IN A STAGGERED PATTERN. INSTALL CHANNEL LINER TO THE TOP OF THE DEFINED CHANNEL SECTION. TWO OR MORE ROWS OF BLANKETS MAY BE NECESSARY, THESE LINERS MUST BE OVERLAPPED 4 INCHES AND STAPLED. THE CHANNEL LINER SHOULD EXTEND TO THE BASE OF THE CHANNEL AND STAPLED. FOR CHANNELS WITH VERY LITTLE OR NO FLOW, EXTEND A MINIMUM OF 1 FOOT BELOW THE LOW WATER LEVEL AND STAPLE IN PLACE. INSTALLATION SPECIFICATIONS TO BE MODIFIED AS NECESSARY TO SUIT ACTUAL SITE CONDITIONS.
REVI	Image: Construction of the service serv















THESE ARE TYPICAL DRAWINGS; ACTUAL SITE CONDITIONS MAY VARY FROM THE SITE GRAPHICALLY REPRESENTED.





TC_A4_BR.DWG 8.5X11





'			/ MAT	(S) OR EQUAL			
					TOPSOIL		
	A t				-SUBSOIL/SPOIL (IF AN NOTE THAT FILTE STRAW BARRIER I IF SUBSOIL/SPOIL A PLACED ON TOPS	Y) R FABRIC OR IS REQUIRED - IS TO BE SOIL	
LE BLOCK		SE			(S) OR EQUAL OPSOIL – SUBSOIL/SPOIL (IF AN – FILTER FABRIC OR BARRIER (IF REQU	Y) STRAW IRED)	
O TITLE	CLEANING	STATION NOTES:					
-11 REVISEI	1. ALL E LOCAT ENVIR	QUIPMENT WILL BE RE TED AS SHOWN ON TH ONMENTAL INSPECTOR	QUIRED TO BE (E CONSTRUCTION	CLEANED AT EQU N DRAWINGS OR	JIPMENT CLEANING STAT AS DIRECTED BY THE	IONS	
2010–10	2. STOCH ENVIR	(PILE TOPSOIL/SUBSOI ONMENTAL INSPECTOR	L AS SHOWN OF	R IN ANY CONFIC	GURATION APPROVED BY	THE	
02	3. Shove Much on Tf	ELS OR OTHER HAND AS MUCH SOIL AS P RACKS AND BLADES.	TOOLS AND/OR RACTICAL FROM	COMPRESSED AI TRACKED EQUIP	R WILL BE USED TO REN MENT. EFFORT WILL BE I	MOVE AS FOCUSED	
	4. IF COL TOOLS	NDITIONS ARE MUDDY, 5 TO REMOVE EXCESS	WHEELED EQUIP SOIL FROM TIRE	PMENT WILL ALSO S AND WHEEL V	D BE CLEANED USING H <i>i</i> VELLS.	AND	
	5. CLEAN MINIMI	NING WILL BE CONDUC	TED ON CONSTR	UCTION MATS OF S BEEN PREVIOU	R OTHER RAISED SURFAC	CE TO	
LS	6. MATS	WILL BE CLEANED BE	tween each pie	ECE OF EQUIPME	NT.		
) LABE	7. SOIL (LOCA)	COLLECTED DURING TH TION NEAR THE CLEAN	IE CLEANING PRO IING STATION AN	OCESS WILL BE ID DISPOSED OF	STOCKPILED AT A CONVI IN AN ACCEPTABLE LAN	ENIENT ND FILL.	
01 REVISED	8. IF THE BACKF COVEF THE S	E SOIL HAS A SIGNIFIC FILLED TRENCH OR IN RED WITH TOPSOIL. IF SOIL WILL BE TAKEN T	CANT COMPONEN THE ADJACENT THE LAND OWNE O AN APPROVED	T OF SUBSOIL, SPOIL STORAGE ER DIES NOT AP DISPOSAL SITE	T WILL BE PLACED OVEF AREA, AND SUBSEQUEN PROVE OF ON-SITE DISF	R THE ITLY POSAL,	
ISIONS	9. SOILS ACCOF	CONTAMINATED WITH RDANCE PROJECT SPC	OIL OR GREASE CC PLAN.	WILL BE REMOV	ED AND DISPOSED OF IN	Ν)
REV	() TransCan	DESIGNER:			KEYSTONE XL PRO		1
	In business to delive	er nc. JMP	<u>2010</u> -10-21	TITLE		0.3 UISOII LINE # 0.3	_
	t: +1.850.385.5441 f: +1.850.385.55 1300 Metropolitan Bivd Tallahassee FI 32309	523 NAME	DATE	EQ	DETAIL 30 JIPMENT CLEANING ST	ATION DETAIL	
		CHECKED BY:	DESIGN CHECKER:	SCALE	DWG No 4359-03-MI	-05-713 REV_02	_
	TC_A4_BR.DWG 8.5	x11 CADD D	RAWING: DO NO)T MAKE MANII			/









APPENDIX C

Proposed Project Description

TABLE OF CONTENTS

1.	Int	roduction1
2.	Pip	eline
3.	An	cillary Facilities1
4.	Ad	ditional Temporary Workspace Areas2
5.	Pip	e Stockpile Sites, Railroad Sidings, and Contractor Yards
6.	Co	nstruction Camps
6	5.1.	Camp Design
6	5.2.	Camp Use
6	5.3.	Camp Decommissioning
7.	Acc	cess Roads
7	7.1.	Roadway Maintenance, Repair, and Safety
8.	Ab	oveground Facilities7
8	8.1.	Pump Stations
8	3.2.	Other Aboveground Facilities
9.	Co	nstruction Procedures9
ç	9.1.	Environmental Compliance Monitoring9
ç	9.2.	General Pipeline Construction Procedures
ç	9.3.	Survey and Staking
ç	9.4.	Clearing and Grading
ç	9.5.	Trenching
ç	9.6.	Pipe Stringing, Bending, and Welding16
ç	9.7.	Lowering In and Backfilling17
ç	9.8.	Hydrostatic Testing
ç	9.9.	Pipe Geometry Inspection
ç	9.10.	Final Tie-ins
ç	9.11.	Commissioning
Ç	9.12.	Cleanup and Restoration
ç	9.13.	Non-Standard Construction Procedures
	9.13	3.1. Road, Highway, and Railroad Crossings
	9.13	3.2. Pipeline, Utility, and Other Buried Feature Crossings21

9.13.3	. Steep Terrain	2
9.13.4	. Unstable Soils	2
9.13.5	. Waterbody Crossings	2
9.13.6	. Wetland Crossings	6
9.13.7	. Fences and Grazing	8
9.14.	Aboveground Facility Construction Procedures	8
9.15.	Construction Workforce and Schedule	9
9.15.1	. Workforce	9
9.15.2	. Schedule29	9
9.16.	Decommissioning	0
10. Opera	ation and Maintenance	2
10.1.	Normal Operations and Routine Maintenance	2
10.2.	Operations	4
11. Electi	rical Transmission and Distribution Lines and Substations	4
11.1.	Construction and Operation of Electrical Transmission and Distribution Lines and	
Substati	ons	5
12. Poten	tial Spills	6
12.1.	Emergency Response Procedures	7
12.2.	Remediation	9
12.3.	Pipeline Incident Analysis 40	0
13. Refer	ences	2

ATTACHMENTS

Attachment 1 Site-Specific HDD Crossings

LIST OF TABLES

Table 1	Construction Camp Permits and Regulations	4
Table 2	Pipeline Construction Spreads Associated with the Proposed Project	. 12
Table 3	Minimum Pipeline Cover	. 15
Table 4	Potential Water Sources along the Project Route ^{a, b, c, d, e}	. 18
Table 5	Waterbodies and Wetlands Crossed Using the HDD Method	. 24
Table 6	Resulting Cross-Country Construction Times Based on Estimates of Schedule	. 30
Table 7	Incident Rate Summary (2010 through 2018)	. 40

LIST OF FIGURES

Figure 1	Typical Pipeline	Construction Sequence	3
	- Jprour - pointe		-

ACRONYMS AND ABBREVIATIONS

APLIC	Avian Power Line Interaction Committee		
BA	Biological Assessment		
BLM	Bureau of Land Management		
BMP	best management practice		
CFR	Code of Federal Regulations		
CMRP	Construction, Mitigation, and Reclamation Plan		
DENR	Department of Natural and Environmental Resources		
DOH	Department of Health		
DPHHS	Department of Public Health and Human Services		
ERP	Emergency Response Plan		
HDD	horizontal directional drilling		
Keystone	TransCanada Keystone Pipeline, LP		
kV	kilovolt		
MAR	Mainline Alternative Route		
MBCB	Montana Building Code Bureau		
MDEQ	Montana Department of Environmental Quality		
MDT	Montana Department of Transportation		
MLV	main line valve		
NDEQ	Nebraska Department of Environmental Quality		
NDHHS	Nebraska Department of Health and Human Services		
NE SFM	Nebraska State Fire Marshal		
OCC	Operations Control Center		
PHMSA	Pipeline and Hazardous Materials Safety Administration		
PS	pump station		
PSRP	Pipeline Spill Response Plan		
ROW	right-of-way		
SCADA	supervisory control and data acquisition		
SD DOT	SD DOT = South Dakota Department of Transportation		
SEIS	Supplemental Environmental Impact Statement		
TWA	temporary work areas		
USEPA	U.S. Environmental Protection Agency		
USDOT	U.S. Department of Transportation		
USFWS	U.S. Fish and Wildlife Service		
WAPA	Western Area Power Administration		

1. INTRODUCTION

This appendix provides additional details to supplement the information provided in the Biological Assessment (BA) related to the description of the proposed Project. Specifically, this appendix includes information regarding the proposed Project's land requirements and other elements, including an overview of pipeline construction and operation activities; ancillary facilities; temporary workspaces; construction camps; access roads; and other aboveground facilities including power lines.

2. PIPELINE

From north to south, the proposed pipeline extends from the United States/Canada border near Morgan, Montana, southeast to Steele City, Nebraska. In total, the proposed Project would consist of approximately 1,209 miles of new, 36-inch-diameter pipeline, with 327 miles in Canada and 882 miles in the United States. Pipeline construction procedures and other supporting information are provided in Section 9, Construction Procedures. Section 10 provides information related to operation and maintenance of the pipeline.

The most recent pipeline route modification occurred in 2017, when TransCanada Keystone Pipeline, LP (Keystone) included the Mainline Alternative Route (MAR) as an alternative to its 2014 Preferred Route¹ in its February 16, 2017, application to the Nebraska Public Service Commission seeking state approval for the proposed Project under Nebraska's Major Oil Pipeline Siting Act. After reviewing Keystone's application, the Nebraska Public Service Commission approved the MAR on November 20, 2017, basing its decision on the application review, hearings, and reviews of the MAR by Nebraska state agencies. Note that the MAR has replaced the corresponding segment of the 2014 Preferred Route; the old route segment is no longer under consideration.

3. ANCILLARY FACILITIES

In addition to the pipeline, Keystone proposes to install and operate aboveground facilities consisting of 19 new pump stations on the Keystone XL line. These pump stations would enable the proposed Project to maintain the pressure required to transport crude oil at the desired throughput volumes. Additionally, Keystone would install and operate one delivery facility, 48 intermediate main line valves (MLVs), in-line inspection facilities, and two densitometer facilities, all of which would be located within the permanent easement or within the footprint of a pump station. Further, check valves would be located within the intermediate MLVs downstream of major river crossings. For a discussion of operations and maintenance that would be performed on ancillary facilities for the proposed Project, see Section 10, Operation and Maintenance.

¹ The 2014 Preferred Route was described in the 2014 Final SEIS (Department 2014).

4. ADDITIONAL TEMPORARY WORKSPACE AREAS

In addition to the typical construction right-of-way (ROW), Keystone has identified special types of additional temporary work areas (TWAs) that would be required. These include areas requiring special construction techniques (e.g., river, wetland, and road/rail crossings, horizontal directional drilling [HDD], entry and exit points, steep slopes, and rocky soils) and construction staging areas. These preliminary areas have been used to quantify effects for the proposed Project (with some in Nebraska that have yet to be determined).

The location of additional TWAs would be adjusted as the proposed Project continues to be refined. This would involve the adjustment of additional temporary workspace, as necessary, related to federally protected species habitat or proximity, actual wetland and waterbody locations, side-hill cuts, and rough terrain. Keystone would adjust additional TWAs at the prescribed setback distance from wetland and waterbody features unless impractical and as determined on a site-specific basis. Examples where a prescribed setback may not be practical include areas where topography does not allow for spoil storage further from streams (e.g., steep slopes located a short distance from streams or wetlands), areas where multiple stream and/or wetland features are in proximity, and areas where trees or other features are identified for avoidance near streams and wetlands.

5. PIPE STOCKPILE SITES, RAILROAD SIDINGS, AND CONTRACTOR YARDS

Extra workspace areas outside of the temporary construction ROW would be required during the construction of the proposed Project to serve as pipe storage sites, railroad sidings, and contractor yards. Locations of these facilities along the MAR are provided in the 2018 MAR Draft Supplemental Environmental Impact Statement (SEIS) (Department 2018). Pipe stockpile sites along the pipeline route have typically been identified in proximity to railroad sidings. Existing public or private roads would be used to access each yard. To the extent practical, Keystone would use existing commercial/industrial sites or sites that previously were used for construction except in the following cases:

- Where said sites are greater than 15 miles from the construction ROW. Doing so would shorten the amount of construction that can be accomplished in a day, prolonging construction, and thereby prolonging reclamation and restoration;
- Where said sites do not exist. The proposed Project area is largely in remote locations of eastern Montana and western/central South Dakota where prior commercial or industrial activity either does not exist or does not exist near the proposed Project area; and,
- Where existing commercial/industrial sites close to the proposed Project area do not have adequate space on their properties for the layout required for pipe or construction yards.

In cases where existing industrial/commercial sites are not available, Keystone looks for already disturbed parcels (mainly in agricultural land use) near the ROW and adjacent to major roads to avoid building roads into a site. The presence of existing power lines along the road that fronts the site is also a requirement to avoid the construction of power lines (if required).

Surveys are then conducted to confirm that no biological (wetlands, listed species habitat, etc.), paleontological or cultural resources are found on site. Once those surveys are completed, Keystone then negotiates with the landowner to ensure it can be used for the duration of construction without hindering the landowner's operations.

All pipe stockpile sites and contractor yards would be used on a temporary basis and would be restored, as appropriate, upon completion of construction. Survey of pipe stockpile sites, railroad sidings, and contractor yards would be completed prior to construction.

Some pipe stockpile sites, railroad sidings, and contractor yards required for the proposed Project have already been built, and the constructed facilities are not located in areas of critical habitat or in areas with known listed species presence. Already-constructed facilities were placed in previously developed areas or in areas with row crop agriculture.

6. CONSTRUCTION CAMPS

Some areas within Montana, South Dakota, and Nebraska do not have sufficient temporary housing in the proposed route vicinity for all construction personnel working in those areas. Temporary work camps would be constructed to meet the workforce housing needs in these remote locations. Some construction camps required for the proposed Project have already been built, and the constructed facilities are not located in areas of critical habitat or in areas with known listed species presence. Already-constructed facilities were placed in previously developed areas or in areas with row crop agriculture. A total of six new temporary construction camps would be established ranging in size from approximately 20 to 90 acres, and totaling approximately 350 acres in size. Four of these new facilities would be located in Montana (McCone, Dawson, and Phillips counties), one in South Dakota (Tripp County), and one in Nebraska (Holt County).

All construction camps would be permitted, constructed, and operated consistent with applicable county, state, and federal regulations. The relevant regulations that would be complied with and the permits required for the construction camps are presented on Table 1. No additional construction camps would be required for the MAR.

State	Permit or Approval	Agency ^a	Submitted by
Montana	Water Main Certified Checklist	MDEQ	Keystone
	Sewer Main Certified Checklist	MDEQ	Keystone
	NOI (Notice of Intent) and Stormwater Pollution Prevention Plan (SWPPP)	MDEQ	Keystone
	Building Permits	MBCB	Camp Contractor
	Driveway Approach Permit	MDT	Camp Contractor
	Work Camp Establishment Plan Review	DPHHS	Camp Contractor
South Dakota	Application for Permit to Discharge Wastewater	DENR	Keystone
	Notice of Intent	DENR	Keystone
	SWPPP	DENR	Keystone
	Temporary Permit to Use Public Waters	DENR	Keystone
	Food License Application	DOH	Camp Contractor
	Application for Highway Access Permit	SD DOT	Keystone
Nebraska	Public Water Supply and Distribution System ^b	NDEQ	Keystone
	Wastewater Collection and Treatment System b	NDEQ	Keystone
	NOI and SWPPP	NDEQ	Keystone
	Food License Application	NDHHS	Camp Contractor
	Building Permits	Local	Camp Contractor
	State Fire Marshal	NE SFM	Camp Contractor

 Table 1
 Construction Camp Permits and Regulations

Source: exp Energy Services 2012

^a MDEQ = Montana Department of Environmental Quality, MBCB = Montana Building Code Bureau; MDT = Montana Department of Transportation, DPHHS = Department of Public Health and Human Services; DENR = Department of Natural and Environmental Resources; SD DOT = South Dakota Department of Transportation; NDEQ = Nebraska Department of Environmental Quality; NDHHS = Nebraska Department of Health and Human Services; NE SFM = Nebraska State Fire Marshal; DOH = Department of Health

^b Submittal for approval requires the submission of a design report, plans, and specifications certified by a professional engineer.

6.1. CAMP DESIGN

The camps would be constructed using modular units and would provide the required infrastructure and systems necessary for complete food service, housing, and personal needs including a convenience store, recreational and fitness facilities, entertainment rooms and facilities, telecommunications/media rooms, kitchen/dining facilities, laundry facilities, and security units. Each camp would also have a medical infirmary to provide first aid and routine minor medical services for the workers and staff. The contractor managing the camps would be responsible for complying with federal, state, and local laws on all waste disposal. There would also be dedicated medical transport vehicles for both the camp sites and for the construction ROW.

The camps' housing facilities would consist of modular, dormitory-like units that house roughly 28 occupants per unit. The units would have heating and air conditioning systems. The camps would be set up with the housing areas clustered together, with both shared and private washrooms. Each camp would contain 600 beds and 300 recreational vehicle spots. Keystone conservatively
intends to permit each camp for 1,000 residents to allow for those instances where there may be more than one person in a recreational vehicle.

Potable water would be provided by drilling a well where feasible and allowed. If Keystone cannot get a permit from the state to install a water well, water would be hauled to the camp from the nearest permitted municipal supply. At the camp in Holt County, Nebraska, no water well would be drilled; water would be purchased and trucked to the camp. Siting of the camps near existing municipal water sources would be a key consideration in locations currently experiencing water restrictions or drought conditions.

A self-contained wastewater treatment facility would be included in each camp except where it is practicable to use a licensed and permitted publicly owned treatment works. Wastewater treated onsite would undergo primary, secondary, and tertiary treatment consisting of solids removal, bioreactor treatment, membrane filtration, and ultraviolet exposure. Final effluent discharge would be consistent with all applicable regulatory requirements. If a publicly owned treatment works is used, Keystone would either pipe or truck wastewater to the treatment facility.

Electricity for the camps would either be generated onsite through diesel-fired generators or would be provided by local utilities from an interconnection to their distribution system. Existing low-voltage power lines lie adjacent to the camp sites or just across the road and would require only short extensions; the longest extension would span approximately 0.25 mile along a roadside to reach the camp in Haakon County, South Dakota.

Keystone would contract with a camp supplier that would provide security 24 hours per day, 7 days per week at each camp. Keystone would work with the supplier to ensure that as many local employees are hired as possible to staff the camps.

6.2. CAMP USE

The camps are planned to service the needs of the proposed Project workforce. As a result, the dormitories do not include facilities for families. Most of the workers would be transported to and from the ROW each day by buses. In addition, individual crews and workers, due to the nature of their work, would be transported to and from job sites by utility trucks or welding rigs. In addition, support workers such as mechanics, parts and supply staff, and supervisory personnel would drive to the ROW in separate vehicles.

6.3. CAMP **D**ECOMMISSIONING

Decommissioning camps would be accomplished in two stages. First, all infrastructure systems would be removed and either hauled away for reuse, recycled, or disposed of in accordance with regulatory requirements. Each site would then be restored and reclaimed in accordance with permit requirements and the applicable procedures described in Keystone's Construction, Mitigation, and Reclamation Plan (CMRP) (see BA Appendix B).

7. ACCESS ROADS

The proposed Project would use public and existing private roads to provide access to most of the construction ROW. Acreages of access roads are provided on Table 2.6-1 of the BA. Paved roads are not likely to require improvement or maintenance prior to or during construction. Gravel roads and dirt roads may require maintenance during the construction period due to high use. Road improvements such as blading and filling would generally be restricted to the existing road footprint; however, road widening may be required in some areas. Private roads and any new temporary access roads would be used and maintained only with permission of the landowner or land management agency.

No off-ROW access roads have been identified for the power lines at this time, except for the power line to Pump Station (PS)-13, which is included in Table 2.6-1 of the BA. Power line access roads, laydown areas, and pulling and tensioning areas would be completed within the ROW to the extent practicable. Any additional areas disturbed outside of the ROW would be subject to additional environmental review.

Keystone proposes to construct short, permanent access roads from public roads to the pump stations and intermediate MLVs. The estimated acres of disturbance associated with the new proposed access roads are listed on Table 2.6-1 of the BA. Prior to construction, Keystone would finalize the location of new permanent access roads along with any temporary access roads. At a minimum, construction of new permanent access roads would require completion of cultural resources and biological surveys, consultations and approvals of the appropriate State Historic Preservation Office and U.S. Fish and Wildlife Service (USFWS) office. Keystone would comply with all federal, state, and local requirements prior to construction. In the future, newly created access road maintenance would be the responsibility of Keystone

To the extent Keystone is required to conduct maintenance of any county roads, it would be done pursuant to an agreement with the applicable county. In the event that oversized or overweight loads would be needed to transport construction materials to the proposed Project work sites, Keystone would submit required permit applications to the appropriate state regulatory agencies.

The acreages of access roads are included in the listing of lands affected on Table 2.6-1 of the BA. Access-road temporary and permanent disturbance estimates are based on the 30-foot roadway width required to accommodate oversized vehicles. In developing the disturbance acreages, all non-public roads were conservatively estimated to require upgrades and maintenance during construction.

7.1. ROADWAY MAINTENANCE, REPAIR, AND SAFETY

Keystone would work with state and local road officials, the pipeline construction contractor, and a third-party road consultant to identify routes to be used for moving materials and equipment between storage and work yards to the pipeline, valve, and pump station construction sites. When these routes are mutually agreed upon, the road consultant would document the existing conditions of roads, including a video record. When construction is completed, the same parties would review the road conditions and Keystone would restore the roads to their preconstruction condition or better. Keystone would pay for this restoration.

Keystone would also perform a preliminary evaluation to determine the design-rated capacity of bridges anticipated to be used during construction and would inspect all bridges it intends to use prior to construction and confirm that the bridge capacity is adequate for the anticipated weights. Keystone would also inspect cattle guard crossings prior to their use. If they are determined to be inadequate to handle anticipated construction traffic, Keystone may place mats on crossings, establish an alternate crossing, enhance existing structures, or install new infrastructure with the landowner's approval, dependent upon specific conditions. Keystone would pay for all such activities.

During construction, Keystone and the pipeline contractor would maintain roads used for construction in a condition that is safe for both the public and work force. Local road officials would be actively engaged in the routine assessment of road conditions.

Keystone would follow all federal, state, and local safety plans and signage as set forth in the various applicable Manuals of Uniform Traffic Control issued by federal, state, or local agencies for streets and highways along the proposed route. This would include compliance with all state and local permits pertaining to road and crossing infrastructure usage.

Keystone would require that each construction contractor submit a road-use plan prior to mobilization, coordinate with the appropriate state and county representatives to develop a mutually acceptable plan, and obtain all necessary road use permits. The road-use plans would identify potential scenarios that may occur during construction based on surrounding land use, known recreational activities, and seasonal influences (such as farming), and would establish measures to reduce or avoid effects to local communities. Keystone would also have inspection personnel monitor road-use activities to ensure that the construction contractors comply with the road-use plans and stipulations of the road.

Some counties in Montana stipulate that a private individual conducting county road maintenance becomes liable for traffic safety on the road. Where this is required, Keystone has stated it would be done pursuant to an agreement with the applicable county, and such agreements would address potential liability, including appropriate indemnity and insurance provisions. Keystone has the necessary insurance coverage to address such potential liability.

8. ABOVEGROUND FACILITIES

As outlined in Table 2.6-1 in the BA, the proposed Project would require approximately 205 acres of land, other than permanent ROW, along the proposed pipeline segments for aboveground pump stations and delivery facilities. Gravel would be used to stabilize the land for permanent facilities, including pump stations, valve sites, and permanent access roads.

8.1. **PUMP STATIONS**

New pump stations, each situated on approximately 15-acre sites, would be constructed for the proposed Project. Each new pump station would consist of up to six pumps driven by electric motors, an electrical equipment shelter, a variable frequency drive equipment shelter, an electrical substation, one sump tank, a remotely operated MLV, a communication tower, a small maintenance building, and a parking area for station maintenance personnel. Stations would operate on locally purchased electric power and would be fully automated for unmanned operation.

The pump stations would have an uninterruptable power supply for all communication and specific controls equipment in the case of a power failure. Backup generators at pump stations are planned as an alternate supply of power for communication and control equipment. As a result of the generators, fuel storage tanks would be required at pump stations. Keystone would install the proper containment structures around the tanks.

Communication towers at pump stations would generally be approximately 33 feet in height. However, antenna height at select pump stations, as determined upon completion of a detailed engineering study, may be taller, but in no event would exceed a maximum height of 190 feet. Communication towers would be constructed without guy wires.

The pipe entering and exiting the pump station sites would be located below grade. The pipe manifolding connected with the pump stations would be above ground. Keystone would use down-lighting wherever possible to minimize effects to wildlife and would install a security fence around the entire pump station site. Inspection and maintenance personnel would access the pump stations through a gate that would be locked when no one is at the pump station.

While most of the pump station locations are identical to those evaluated in the 2014 Final SEIS, as part of the MAR, PS-23B was added and PS-24 and PS-25 were relocated. (See Figure 3.7-3 of the 2018 MAR Draft SEIS.) Of note, previous versions of the proposed Project included two additional pump stations in Kansas along the existing Keystone Pipeline system; however, Keystone has recently determined that these two stations have independent commercial utility and will be constructed regardless of whether the proposed Project is approved. Therefore, they are not part of the proposed Project.

8.2. OTHER ABOVEGROUND FACILITIES

Keystone proposes to construct 48 intermediate MLV sites along the new pipeline ROW. Intermediate MLVs would be sectionalizing block valves generally constructed within a fenced, 50-by-50-foot site located on the permanent easement. Remotely operated intermediate MLVs would be located at major river crossings and upstream of sensitive waterbodies and at intermediate locations. Additional remotely operated MLVs would be located at pump stations. These remotely operated valves can be activated to shut down the pipeline in the event of an emergency to minimize environmental effects in the unlikely event of a spill. The actual spacing intervals between the MLVs and intermediate MLVs would be based on the locations of pump stations, waterbodies wider than 100 feet, and sensitive environmental resources; federal

regulations and the 57 Project-specific conditions (see Appendix Z of the 2014 Final SEIS); and hydraulic profile considerations.

The proposed Project would be designed to permit in-line inspection of the entire length of the pipeline with minimal service interruption. Pig launchers and/or receivers would be constructed and operated completely within the boundaries of the pump stations or delivery facilities. Launchers and receivers would allow pipeline in-line inspection with high-resolution internal line inspection tools and maintenance cleaning pigs.

9. CONSTRUCTION PROCEDURES

Keystone would design, construct, test, and operate the facilities in accordance with all applicable requirements included in U.S. Department of Transportation (USDOT) regulations at 49 Code of Federal Regulations (CFR) 195, Transportation of Hazardous Liquids by Pipeline, other applicable regulations, as well as special conditions set forth in Appendix Z of the 2014 Final SEIS. The 2014 Final SEIS contains detailed descriptions of procedures Keystone would use for pipeline construction. The following sections summarize and incorporate by reference the construction procedures for the proposed pipeline described in Chapter 2 of the 2014 Final SEIS and the Keystone XL CMRP (BA Appendix B). The following sections also discuss the construction of ancillary facilities and connected actions.

9.1. Environmental Compliance Monitoring

To manage construction effects, Keystone would implement its CMRP (BA Appendix B). The CMRP contains procedures that would be used throughout the proposed Project to avoid or minimize effects. Subsections of the CMRP address specific environmental conditions. Procedures to restore effects to the permanent ROW are also described in the CMRP.

The following is one example of the mitigation measures (see Section 7.1 in BA Appendix B) that would be implemented by Keystone for crossing waterbodies and wetlands:

- The contractor shall comply with requirements of all permits issued for the waterbody crossings by federal, state, or local agencies.
- Waterbody includes any areas delineated as jurisdictional, natural, or artificial stream, river, or drainage, and other permanent waterbodies such as ponds and lakes:
 - Minor waterbody includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of construction.
 - Intermediate waterbody includes all waterbodies greater than 10 feet wide, but less than or equal to 100 feet wide at the water's edge at the time of construction.
 - Major waterbody includes all waterbodies greater than 100 feet wide at the water's edge at the time of construction.

In the event a waterbody crossing is located within or adjacent to a wetland crossing, the contractor, to the extent practicable, would implement the provisions in both CMRP Section 6, Wetland Crossings, and Section 7, Waterbodies and Riparian Lands (see BA Appendix B). In some instances, it may not be practicable to implement all of the provisions in the CMRP for wetland and waterbody crossings at select larger stream crossings. In order to meet the pipeline depth of cover requirements and ensure the safety of the workers, some of these crossings may require additional temporary workspace adjacent to the stream banks to store the large volume of spoil generated from the trench excavation. This additional temporary workspace could be greater than the 85 feet width limitation for the construction ROW as stated in Section 6.2 of the CMRP. Additionally, the temporary spoil storage may need to be 10 feet inside of the wetland boundaries in order to avoid ferrying spoil further back because of the limited reach of backhoes. In these instances where it is not practicable to implement all the provisions in the CMRP for wetland crossings adjacent to waterbody crossings where additional temporary workspace is required in the wetland, Keystone will still adhere to ensuring wetland restoration by stripping topsoil and monitoring the site after construction to ensure the wetland is restored.

The contractor must supply and install advisory signs in a readily visible location along the construction ROW at a distance of approximately 100 feet on each side of the crossing and on all roads that provide direct construction access to waterbody crossing sites. Signs must be supplied, installed, maintained, and then removed upon completion of the proposed Project. Additionally, the contractor must supply and install signs on all intermediate and major waterbodies accessible to recreational boaters warning boaters of pipeline construction operations.

The contractor must not store hazardous materials, chemicals, fuels, lubricating oils, or perform concrete coating within 100 feet of any waterbody. The contractor must not refuel construction equipment within 100 feet of any waterbody. If the contractor must refuel construction equipment within 100 feet of a waterbody, it must be done in accordance with the requirements outlined in the CMRP Section 3 (see BA Appendix B). All equipment maintenance and repairs must be performed in upland locations at least 100 feet from waterbodies and wetlands. All equipment parked overnight must be at least 100 feet from a watercourse or wetland, if possible. Situations that may require parking equipment within 100 feet of a watercourse or wetland could include the stationing of water pumps necessary for HDD installation or for water use during construction (dust control, hydrostatic testing, etc.). All pumps and accompanying fuel tanks would be placed in level areas with berms and liners to prevent accidental release of fuel during use. Equipment must not be washed in streams or wetlands. Throughout construction, the contractor must maintain adequate flow rates to protect aquatic life and to prevent the interruption of existing downstream uses.

Keystone may allow modification of the specifications as necessary to accommodate specific situations or procedures. Any modifications must comply with all applicable regulations and permits. The contractor would not make changes to the proposed Project outside the surveyed study corridor on which the present document is based. Acreage of changes would be tracked to keep within the total used for calculating mitigation. If the contractor requires a change outside the previously surveyed corridor, then Keystone would coordinate with the USFWS prior to implementation of the required change.

The Project's Spill Prevention, Control, and Countermeasure Plan (see BA Appendix D) would be implemented to avoid or minimize the potential for harmful spills and leaks during construction. The plan describes spill prevention practices, emergency response procedures, emergency and personnel protection equipment, release notification procedures, and cleanup procedures. Keystone would use environmental inspectors on each construction spread and coordinate with USFWS and other agencies as appropriate.

The environmental inspectors would review the proposed Project activities daily for compliance with state, federal, and local regulatory requirements and would have the authority to stop specific tasks as approved by the chief inspector. The inspectors would also be able to order corrective action in the event that construction activities violate CMRP provisions, landowner requirements, or any applicable permit requirements. The compliance manager for Keystone would be the point person for communication with the USFWS as required. The monitors that would be used in the field would be reporting to the environmental inspectors, who in turn report to the compliance manager. If required, the monitors would discuss any required interpretation or issues with the USFWS with the compliance manager.

Mitigation and other measures contained in the September 7, 2012, TransCanada Keystone XL Pipeline Project Environmental Report would apply to the basic design and construction specifications applicable to lands disturbed by the proposed Project (exp Energy Services 2012). This approach would enable construction to proceed with a single set of specifications, irrespective of the ownership status (federal versus non-federal) of the land being crossed. On private lands, these requirements may be modified slightly to accommodate specific landowner requests or preferences or state-specific conditions. Compiled mitigation measures are listed in Appendix Z of the 2014 Final SEIS.

9.2. GENERAL PIPELINE CONSTRUCTION PROCEDURES

Before starting construction at a specific site, engineering surveys of the ROW centerline and additional TWAs would be finalized and the acquisition of ROW easements and any necessary acquisitions of property in fee would be completed.

As proposed, the pipeline would be constructed in 10 spreads (or sequences) of approximately 13 to 95 miles long (see Table 2). Final spread configurations and the final construction schedule may result in the use of additional spreads or fewer shorter or longer spreads. Pipeline construction generally proceeds as a moving assembly line as shown on Figure 1 and summarized below. Standard pipeline construction is composed of specific activities, including survey and ROW staking, clearing and grading, pipe stringing, bending, trenching, welding, lowering in, backfilling, hydrostatic testing, and cleanup. In addition to standard pipeline construction methods, special construction techniques would be used where warranted by site-specific conditions. These special techniques would be used when constructing across rugged terrain, waterbodies, wetlands, paved roads, highways, and railroads (see Section 8.2, Other Aboveground Facilities).

	Miles by State			Location	Approximate
State		County	Spread Number	(Mile Post)	Length of Construction Spread (Miles)
		Phillips, Valley	Spread 1	0-90.03	90.03
Montana	285.65	McCone, Dawson	Spread 2	90.03-163.06	73.03
Montana	205.05	Dawson, Prairie, Fallon	Spread 3	163.06-256.00	92.94
		Fallon	Spread 4	256.00.250.26	94.26
		Harding	- Spread 4	250.00-550.20	
South	215 20	Harding, Butte, Perkins, Meade,	Spread 5	350.26-4329.67	79.41
Dakota	515.29	Pennington, Haakon, Jones	Spread 6	429.67-524.83	95.16
		Jones, Lyman, Tripp	Spread 7	524.92 (14.02	89.20
	281.05	Keya Paha		524.85-014.05	
Nebraska		Keya Paha, Boyd, Holt, Antelope	Spread 8	614.03-708.67	94.64
		Antelope, Madison, Stanton, Platte, Colfax, Butler	Spread 9	708.67-800.58	91.91
		Butler, Seward, Saline, Jefferson	Spread 10	800.58-882.00	81.42

Table 2Pipeline Construction Spreads Associated with the Proposed Project





Normal construction activities would be conducted during daylight hours, with the following exceptions.

- Completion of critical tie-ins on the ROW may occur after daylight hours. Completion requires tie-in welds, non-destructive testing, and sufficient backfill to stabilize the ditch.
- HDD operations may be conducted after daylight hours, if determined by the contractor to be necessary to complete a certain location. In some cases, that work may be required continuously until the work is completed; this may last one or more 24-hour days. Such operations may include drilling and pull-back operation, depending on the site and weather conditions, permit requirements, schedule, crew availability, and other factors.
- HDD operations are proposed to occur landward of forested corridors to provide a vegetative screen from operations, including night operations. However, in some instances there may be a lack of a vegetative screen between HDD operations and the water feature in an area with active tern and plover colonies or in an area providing suitable roosting habitat for whooping cranes during spring and fall migrations. Should night work be necessary in those instances, downshielding of lights would be done to prevent illumination of the area and disturbance to nesting interior least terns, piping plovers, and roosting whooping cranes.
- While not anticipated in typical operations, certain work may be required after the end of daylight hours due to weather conditions, for safety, or for other proposed-Project requirements.

9.3. SURVEY AND STAKING

Before construction begins at any given location, the limits of the approved work area (i.e., the construction ROW boundaries and any additional TWAs) would be marked and the location of approved access roads and existing utility lines would be flagged. Landowner fences would be braced and cut and temporary gates and fences would be installed to contain livestock, if present. Wetland boundaries and other environmentally sensitive areas also would be marked or fenced for protection at this time. Fencing would be removed following pipeline construction. Before the pipeline trench is excavated, a survey crew would stake the proposed trench centerline and any buried utilities along the ROW.

9.4. CLEARING AND GRADING

A clearing crew would follow the fencing crew and would clear the work area of vegetation (including crops) and obstacles (e.g., trees, logs, brush, rocks). (See Section 9.12 for information regarding cleanup and restoration.) Keystone intends to clear grassland and shrub habitats in the fall prior to construction, where access is granted and where feasible (e.g., terrain limitations may limit mower access, or access into the ROW may be precluded until access roads are built). This timing would avoid effects to nesting birds.

Standard agricultural implements would be used on agricultural lands and standard machinery used in timber clearing would be used in forested lands. The amount of top soil stripping would be determined in coordination with the landowner (based on agricultural use) and the Natural Resources Conservation Service. Full ROW stripping for forested lands would be avoided as practicable.

Temporary erosion control measures such as silt fence would be installed prior to or immediately after vegetation removal along slopes leading to wetlands and riparian areas (for erosion control maintenance procedures, see Section 4.5.1 in BA Appendix B, Construction, Mitigation, and Reclamation Plan). Grading would be conducted where necessary to provide a reasonably level work surface. Where the ground is relatively flat and does not require grading, rootstock would be left in the ground. More extensive grading would be required in steep side slopes or vertical areas and where necessary to safely construct the pipe along the ROW.

9.5. TRENCHING

The trench would be excavated to a depth that provides sufficient cover over the pipeline after backfilling. Typically, the trench would be 7 to 8 feet deep and 4 to 5 feet wide in stable soils. In most areas, the USDOT requires a minimum of 30 inches of cover and as little as 18 inches in rocky areas. To reduce the risk of third-party damage, Keystone proposes to exceed the federal depth-of-cover requirements in most areas. In all areas, except consolidated rock areas, the depth-of-cover for the pipeline would be a minimum of 48 inches (Table 3). In consolidated rock areas, the minimum depth of cover would be 36 inches. Trenching may precede bending and welding or may follow based on several factors, including soil characteristics, water table, presence of drain tiles, and weather conditions at the time of construction. Generally, the crews on each construction spread are synchronized with the welding crews for efficiency. The amount of open trench is minimized to the extent possible. When rock or rocky formations are encountered, tractor-mounted mechanical rippers or rock trenchers would be used to fracture the rock prior to excavation. After the pipeline is padded, excavated rock would be used to backfill the trench to the top of the existing bedrock profile.

Location	Normal Cover (inches)	Cover in Rock Excavation Areas (inches)
Most areas	48	36
All waterbodies	60	36
Dry creeks, ditches, drains, washes, gullies, etc.	60	36
Drainage ditches at public roads and railroads	60	48

Table 3Minimum Pipeline Cover

In agricultural land, rocks that are exposed on the surface due to construction activity would be removed from the ROW prior to and after topsoil replacement to an equivalent quantity, size, and distribution of rocks as that on adjacent, undisturbed lands. Rock clearing may be carried out with a mechanical rock picker or by manual means, provided that topsoil preservation is assured. Rock removed from the ROW would be hauled off the landowner's premises or disposed of on the landowner's premises at a location that is mutually acceptable to the landowner and to Keystone.

Topsoil segregation would be based on site-specific circumstances and one of the following procedures would be implemented. Topsoil would be separated from subsoil only over the trench,

over the trench and spoil side, or over the full width of ROW. Keystone may also conduct full ROW topsoil stripping in other areas where it is beneficial from a construction standpoint, or where required by landowners or land managers. When soil is removed from only the trench, topsoil would typically be piled on the near side of the trench and subsoil on the far side of the trench. This would allow for proper soil restoration during the backfilling process. When soil is removed from both the trench and the spoil side, topsoil would typically be stored on the edge of the near side of the construction ROW and the subsoil on the spoil side of the trench. In areas where the ROW would be graded to provide a level working surface and where there is another need to separate topsoil from subsoil, topsoil would be removed from the entire area to be graded and stored separately from the subsoil.

Topsoil would be piled such that the mixing of subsoil and topsoil would not occur. Gaps would be left between the spoil piles to prevent storm water runoff from backing up or flooding. Temporary erosion control measures such as silt fence would be installed to prevent runoff into surface waters (see BA Appendix B).

9.6. PIPE STRINGING, BENDING, AND WELDING

Prior to or following trenching, sections of externally coated pipe approximately 80 feet long (also referred to as "joints") would be transported by truck over public roads and along authorized private access roads to the ROW and placed or "strung" along the ROW.

After the pipe sections are strung along the trench and before joints are welded together, individual sections of the pipe would be bent to conform to the trench contours by a track-mounted, hydraulic pipe-bending machine. For larger bend angles, fabricated bends may be used.

After the pipe sections are bent, the joints would be welded together into long strings and placed on temporary supports. During welding, the pipeline joints would be lined up and held in position until securely joined. Keystone proposes to non-destructively inspect 100 percent of the welds using radiographic, ultrasonic, or other USDOT-approved methods. Welds that do not meet established specifications would be repaired or removed. Once the welds are approved, a protective epoxy coating would be applied to the welded joints. The pipeline would then be electronically inspected or "jeeped" for faults or "holidays" in the epoxy coating and visually inspected for any faults, scratches, or other coating defects. Damage to the coating would be repaired before the pipeline is lowered into the trench.

In rangeland areas used for grazing, construction activities potentially can hinder the movement of livestock if the livestock cannot be relocated temporarily by the owner. Construction activities may also hinder the movement of wildlife. To minimize the effect on livestock and wildlife movements during construction, Keystone would leave hard plugs (short lengths of unexcavated trench) or install soft plugs (areas where the trench is excavated and replaced with minimal compaction) to allow livestock and wildlife to cross the trench safely. Soft plugs would be constructed with a ramp on each side to provide an avenue of escape for animals that may fall into the trench.

9.7. LOWERING IN AND BACKFILLING

Before the pipeline is lowered into the trench, the trench would be inspected to be sure it is free of livestock or wildlife, as well as rock and other debris that could damage the pipe or its protective coating. In areas where water has accumulated, dewatering may be necessary to permit inspection of the bottom of the trench. Discharge of water from dewatering would be accomplished in accordance with applicable discharge permits. The pipeline then would be lowered into the trench.

On sloped terrain, trench breakers (e.g., stacked sand bags or foam) would be installed in the trench at specified intervals to prevent subsurface water movement along the pipeline. See BA Appendix B, Construction, Mitigation, and Reclamation Plan, for a figure depicting a trench breaker and a discussion of the intervals (CMRP Section 4.5.3). The intervals are determined in the field based on slope length and height. The trench would then be backfilled using the excavated material.

In rocky areas, the pipeline would be protected with an abrasion resistant coating or rock shield (fabric or screen that is wrapped around the pipe to protect the pipe and its coating from damage by rocks, stones, and roots). Alternatively, the trench bottom would be filled with padding material (e.g., sand, soil, or gravel) to protect the pipeline. An estimated 85,000 cubic yards of padding material would be required. No topsoil would be used as padding material. Topsoil would be returned to its original horizon after subsoil is backfilled in the trench.

9.8. HYDROSTATIC TESTING

The pipeline would be hydrostatically tested in sections typically 30 to 50 miles long to ensure the system is capable of withstanding the operating pressure for which it is designed. This process involves isolating the pipe segment with test manifolds, filling the segment with water, pressurizing the segment to a minimum of 100 percent specified minimum yield strength at the high point elevation of each test section, and maintaining that pressure for a minimum 8-hour period. Fabricated assemblies may be tested prior to installation in the trench for a 4-hour period. The hydrostatic test would be conducted in accordance with 49 CFR 195.

Water for hydrostatic testing would generally be obtained from rivers, streams, and municipal sources in close proximity to the pipeline and in accordance with federal, state, and local regulations. Intakes would be screened to prevent entrainment of fish, and intake and discharge locations would be determined with construction contractors. A preliminary list of potential hydrostatic test water sources is included on Table 4. Three primary sources would be used for hydrostatic testing along the MAR: the Elkhorn River, the Platte River, and the Big Blue River. Generally the pipeline would be hydrostatically tested after backfilling and all construction work that would directly affect the pipe is complete. If leaks are found, they would be repaired and the section of pipe retested until specifications are met. Chemicals are not added to the test water. The water is generally the same quality as the source water since there are no additives to the water. Water used for the testing would then be returned to the source or transferred to another pipe segment for subsequent hydrostatic testing. After hydrostatic testing, the water would be tested to ensure compliance with the National Pollutant Discharge Elimination System discharge permit requirements, treated if necessary, and discharged.

County	Waterbody Name	Maximum Water Withdrawal (million gallons)
Phillips	Frenchman Creek	32
Valley	Milk River	32
Valley/McCone	Missouri River	55
Dawson	Yellowstone River	55
Harding	Little Missouri River	27
Harding	Gardner Lake	67
Perkins	North Fork Moreau River	36
Meade	Cheyenne River	35
Haakon	Bad River	22
Tripp	White River	73
Boyd	Keya Paha River	37
Holt	Niobrara River	37
Antelope	Elkhorn River	37
Butler	Platte river	47
Seward	West Fork of Big Blue River	40

Table 4Potential Water Sources along the Project Route a, b, c, d, e

^a These volumes are estimated at this time. Final volumes will be included in appropriate water use permits for each state. At that time, the state permitting agency would determine which rivers can be used, if they approve the volume, and any permitting conditions associated with the withdrawals. Water would be used for hydrostatic test water, drilling mud for HDD operations, and dust control.

^b Additional water sources would be needed for dust control. These additional sources would require lower volumes (up to 6 million gallons on average). Dust-control sources would be permitted in accordance with state permit requirements and could include existing irrigation wells.

^c Ground water sources (irrigation wells) may be used for water sources instead of the rivers listed above. These water sources and the volumes to be used would be purchased from landowners and would be permitted in accordance with state requirements.

^d These water volumes would be required for both years of construction.

^e Additional water would be withdrawn from irrigation wells in several counties crossed by the proposed Project for approximately 55 million gallons of water for dust control, hydrostatic testing, and HDD operations.

Keystone has prepared and filed permit applications with Montana and South Dakota agencies for the use of water from the major rivers in each state to support water needs for construction of the proposed Project. The rivers where water use was requested include the Missouri and Yellowstone rivers in Montana and the Cheyenne, Bad, and White rivers in South Dakota. These large rivers have ample capacity to allow a one-time withdrawal for the proposed uses, the majority of which is for hydrostatic testing, which will eventually return the water to its source, resulting in no loss to the watershed or effects to downstream habitats. The agencies have indicated that Keystone's request will be weighed against the existing water rights in each river, the requirements to maintain downstream fish and wildlife habitat, and tribal rights for these rivers. Keystone's request would only be granted if it does not impinge on these requirements during low-flow conditions (e.g., drought). Agencies would also dictate the withdrawal rate and volume of water that would be permitted, which would result in water use occurring over a period of time to maintain existing rights/uses as well as downstream habitat.

If inadequate water is available from rivers, Keystone would use alternative water sources nearby such as local private wells or municipal sources for HDD operations, mainline hydrostatic testing, and dust control during these dry conditions. Keystone has indicated that in the event surface water

is unavailable, groundwater would be used for HDD operations, hydrostatic testing, and dust control. Water would be purchased from nearby willing sellers and would not increase overall groundwater use.

The used hydrostatic test water would be discharged either to the source waterbody within the same water basin or to a suitable upland area near the test discharge. To reduce the discharge velocity to upland areas, energy dissipating devices would be employed. Energy dissipation devices that are consistent with best management practice (BMP) protocols include the following:

- Splash Pup—a splash pup consists of a piece of large-diameter pipe (usually over 20-inch outside diameter) of variable length with both ends partially blocked. The splash pup is welded perpendicular to the discharge pipe. As the discharge hits against the pup's inside wall, the velocity is rapidly reduced and the water allowed to flow out either end. A splash pup design variation, commonly called a diffuser, has capped ends and many holes punched in the pup to diffuse the energy.
- Splash Plate—the splash plate is a quarter section of 36-inch pipe welded to a flat plate and attached to the end of a 6-inch-diameter discharge pipe. The velocity is reduced by directing the discharge stream into the air as it exits the pipe. This device would also be effective for most overland discharge.
- Plastic Liner—in areas where highly erodible soils exist or in any low-flow drainage channel, it is a common practice to use layers of construction fabric to line the receiving channel for a short distance. A small load of rocks may be used to keep the fabric in place during the discharge. Additional methods, such as the use of plastic sheeting or other material to prevent scour, would be used as necessary to prevent excessive sedimentation during dewatering.
- Straw Bale Dewatering Structure—straw bale dewatering structures are designed to dissipate and remove sediment from the water being discharged. Straw bale structures could be used alone for on-land discharge of hydrostatic test water or in combination with other energy dissipating devices for high-volume discharges. Dewatering filter bags may be used as alternatives to straw bale dewatering structures.

Hydrostatic test water would not be discharged into state-designated exceptional value waters, waterbodies that provide habitat for federally protected species, or waterbodies designated as public water supplies, unless appropriate federal, state, or local permitting agencies grant written permission. To avoid effects from introduced species, no inter-basin transfers (discharge) of hydrostatic test water would occur without specific permitting approval to discharge into an alternative water basin. Discharge lines would be securely supported and tied down at the discharge end to prevent whipping during discharge. Hydrostatic testing is discussed further in Section 8 of the CMRP (see BA Appendix B).

9.9. PIPE GEOMETRY INSPECTION

The pipeline would be inspected prior to final tie-ins using an electronic caliper (geometry) pig to ensure the pipeline does not have any dents, bulging, or ovality that might be detrimental to pipeline operation.

9.10. FINAL TIE-INS

Following successful hydrostatic testing, test manifolds would be removed and the final pipeline tie-in welds would be made and inspected.

9.11. COMMISSIONING

After the final tie-ins are complete and inspected, the pipeline would be cleaned and dewatered. Commissioning involves verifying that equipment has been installed properly and is working, that controls and communications systems are functional, and that the pipeline is ready for service. In the final step, the pipeline would be prepared for service by filling the line with crude oil.

9.12. CLEANUP AND RESTORATION

During cleanup, construction debris on the ROW would be disposed of and work areas would be final-graded. Preconstruction contours would be restored as closely as possible. Segregated topsoil would be spread over the ROW surface and permanent erosion controls would be installed. After backfilling, final cleanup would begin as soon as weather and site conditions permit. Every reasonable effort would be made to complete final cleanup (including final grading and erosion control device installations) within approximately 20 days after backfilling the trench (approximately 10 days in residential areas), subject to weather and seasonal constraints. Construction debris would be cleaned up and taken to an appropriate disposal facility.

After permanent erosion control devices are installed and final grading complete, all disturbed work areas except annually cultivated fields would be seeded as soon as possible. Seeding is intended to stabilize the soil, revegetate areas disturbed by construction, and restore native vegetation. Timing of the reseeding efforts would depend on weather and soil conditions and would be subject to the prescribed rates and seed mixes specified by the landowner, land management agency, or Natural Resources Conservation Service recommendations. In recognition of the importance of milkweed and other flowering forbs to wildlife, native seed mixes containing such species would be given preferential consideration for reseeding native grasslands, subject to landowner agreement. On agricultural lands, seeding would be conducted only as agreed upon with the landowner. Once operation begins, Keystone is required to monitor the pipeline no more frequently than every 3 weeks. Monitoring would mostly be done from aerial reconnaissance, but also ground inspections. In addition, landowners would be asked to report on areas where seeds may have not germinated or erosion has appeared. Keystone would then dispatch crews to repair and address the issues (see Section 4.16 in BA Appendix B, Construction, Mitigation, and Reclamation Plan).

Keystone would restore and replace fences where they occur. Keystone would also restrict access to the permanent easement using gates, boulders, or other barriers to minimize unauthorized access by all-terrain vehicles in wooded areas or other previously unfenced areas if requested by the landowner. Pipeline markers would be installed at road and railroad crossings and other locations (as required by 49 CFR 195) to show the pipeline location. Markers would identify the pipeline owner and convey emergency contact information. Special markers providing information and guidance to aerial patrol pilots also would be installed.

The ROW would be inspected after the first growing season to determine revegetation success and noxious weed control. Eroded areas would be repaired and areas that were unsuccessfully reestablished would be revegetated by Keystone or Keystone would compensate the landowner for reseeding. The CMRP (see BA Appendix B) provides information on revegetation and weed control procedures that Keystone would incorporate into the proposed Project.

9.13. NON-STANDARD CONSTRUCTION PROCEDURES

In addition to standard pipeline construction methods, special construction techniques would be used where warranted by site-specific conditions. These special techniques would be used when crossing roads, highways, and railroads, steep terrain, unstable soils, waterbodies, wetlands, and residential and commercial areas. These special techniques are described below.

9.13.1. Road, Highway, and Railroad Crossings

Construction across paved roads, highways, and railroads would be in accordance with the requirements of the appropriate road and railroad crossing permits and approvals. In general, all major paved roads, all primary gravel roads, highways, and railroads would be crossed by boring beneath the road or railroad. Boring requires excavating a pit on each side of the feature, placing boring equipment in the pit, and boring a hole under the road at least equal to the pipe diameter. Once the hole is bored, a prefabricated pipe section would be pulled through the borehole. For long crossings, sections can be welded onto the pipe string just before pulling through the borehole. Each boring would be expected to take 1 to 2 days for most roads and railroads and 10 days for long crossings such as interstate or four-lane highways.

Most smaller, unpaved roads and driveways would be crossed using the open-cut method where permitted by local authorities or private owners. Most open-cut road crossings can be finished and the road resurfaced in 1 or 2 days.

9.13.2. Pipeline, Utility, and Other Buried Feature Crossings

Keystone and its pipeline contractors would comply with USDOT regulations, utility agreements, and industry BMPs with respect to utility crossing and separation specifications. One-call notification would be made for all utility crossings so respective utilities are identified accordingly.

Unless otherwise specified in a crossing agreement, the contractor would excavate to allow pipeline installation across the existing utility with a minimum clearance of 12 inches. The clearance would be filled with sandbags or suitable fill material to maintain the clearance. Backfill of the crossing would be compacted in lifts to ensure continuous support of the existing utility.

For some crossings, the utility owner may require their own employees to excavate and expose the facility before the Keystone contractor arrives. In those cases, Keystone would work with owners to complete work to the satisfaction of the owner.

Where the owner of the utility does not require pre-excavation, generally, the pipeline contractor would locate and expose the utility before conducting machine excavation.

9.13.3. Steep Terrain

Although there are no steep slopes that need to be avoided in the current route alignment, microadjustments to the route may necessitate grading in areas where the proposed pipeline route would cross steep slopes. Keystone would avoid or minimize, to the extent practicable, microadjustments that would encounter steep slopes. Steep slopes often need to be graded down to a gentler slope for safe construction equipment operation and to accommodate pipe-bending limitations. In such areas, the slopes would be excavated prior to pipeline installation and reconstructed to a stable condition (see Section 7.11 in BA Appendix B, Construction, Mitigation, and Reclamation Plan).

In areas where the pipeline route crosses laterally along the side of a slope, cut-and-fill grading may be required to obtain a safe, flat work terrace. Topsoil would be stripped from the entire ROW and stockpiled prior to cut-and-fill grading on steep terrain. Generally on steep slopes, soil from the high side of the ROW would be excavated and moved to the low side of the ROW to create a safe and level work terrace. After the pipeline is installed, the soil from the low side of the ROW would be returned to the high side, and the slope's contour would be restored as near as practicable to preconstruction condition. Topsoil from the stockpile would be spread over the surface, erosion control features installed, and seeding implemented.

In steep terrain, temporary sediment barriers such as silt fence would be installed during clearing to prevent disturbed soil movement into wetland, waterbody, or other environmentally sensitive areas. Temporary slope breakers consisting of mounded and compacted soil would be installed across the ROW during grading and permanent slope breakers would be installed during cleanup. Following construction, seed would be applied to steep slopes and the ROW would be mulched with hay or non-brittle straw or covered with erosion control fabric. Sediment barriers would be maintained across the ROW until permanent vegetation is established. Additional temporary workspace may be required for storing graded material and/or topsoil during construction (see Section 4.5.2 and 7.11 in BA Appendix B, Construction, Mitigation, and Reclamation Plan).

9.13.4. Unstable Soils

Construction in unstable soils, such as those within the fragile soils of South Dakota and Nebraska, would be in accordance with measures outlined in the CMRP (see BA Appendix B). Construction in these areas could require extended TWAs. Special construction and mitigation techniques would be applied to areas with high potential for landslides and erosion-prone locations. To facilitate restoration, Keystone could implement measures such as the use of photodegradable mats and livestock controls (see Section 4.15.3 in BA Appendix B).

9.13.5. Waterbody Crossings

According to the 2018 National Hydrography Dataset (USGS 2018), there are approximately 975 waterbody crossings along the proposed pipeline route, including 44 perennial rivers/streams, 848 intermittent streams, 15 canals, and 68 waterbodies identified as either artificial impoundments, ditches, artificial or natural lakes, ponds, or reservoirs. Of those, the MAR would cross a total of 105 waterbodies, including 31 perennial rivers and streams, 60 intermittent/ephemeral streams,

and 14 other waterbodies (e.g., levee and water control structures such as manmade ditch, etc.). Perennial waterbodies would be crossed using one of four techniques: the open-cut wet method (the preferred method), dry flume method, dry dam-and-pump method, or HDD. Each method is described below. In the final design phase of the proposed Project, qualified personnel would assess waterbody crossings with respect to the potential for channel aggradation or degradation and lateral channel migration. The level of assessment for each crossing would vary based on the qualified design personnel's professional judgment.

The pipeline would be installed as necessary to address any hazards the assessment identifies. The pipeline would be installed at the design crossing depth for at least 15 feet beyond the design lateral migration zone, as determined by qualified personnel. The crossing design also would include the specification of appropriate stabilization and restoration measures. The actual crossing method employed at a perennial stream would depend on permit conditions from the U.S. Army Corps of Engineers and other relevant regulatory agencies, as well as additional conditions that may be imposed by landowners or land managers at the crossing location.

The preferred crossing method would be to use the open-cut crossing method. The open-cut method involves trenching through the waterbody while water continues to flow through the construction work area. Pipe segments for the crossing would be fabricated adjacent to the waterbody. Generally, backhoes operating from one or both banks would excavate the trench within the streambed. In wider rivers, in-stream operation of equipment may be necessary. Temporary bridge access would be used for construction equipment to cross streams. Waterbody crossing construction methods are explained in Section 7.4 in BA Appendix B, Construction, Mitigation, and Reclamation Plan.

Hard or soft trench plugs would be placed to prevent water flow into the upland portions of the trench. Trench spoil excavated from the streambed generally would be placed at least 10 feet away from the water's edge unless stream width is great enough to require placement in the stream bed. Sediment barriers would be installed where necessary to control sediment and to prevent excavated spoil from entering the water. After the trench is excavated, the prefabricated pipeline segment would be carried, pushed, or pulled across the waterbody and positioned in the trench. When crossing saturated wetlands with flowing waterbodies using the open-cut method, the pipe coating would be covered with reinforced concrete or concrete weights to provide negative buoyancy. The need for weighted pipe would be determined by detailed design and site conditions at the time of construction. The trench would then be backfilled with native material or with imported material if required by applicable permits.

Following backfilling, the banks would be restored and stabilized. Keystone designs the crossing burial depth as well as distance from the existing banks to meet regulatory requirements and future potential stream migration. Routine inspections during operations also require Keystone to check on and maintain Pipeline and Hazardous Materials Safety Administration (PHMSA) required burial depth.

The proposed Project would use dry flume or dry dam-and-pump methods where technically feasible on environmentally sensitive waterbodies as warranted by resource-specific sensitivities. The flume crossing method involves diverting the water flow across the trenching area through

one or more flume pipes placed in the waterbody. The dam-and-pump method is similar to the flume method except that pumps and hoses would be used instead of flumes to move water around the construction work area. In both methods, trenching, pipe installation, and backfilling are done while water flow is maintained for all but a short reach of the waterbody at the actual crossing. Once backfilling is complete, the streambanks are restored and stabilized and the flume or pump hoses are removed.

Keystone plans to use the HDD method for crossing 18 waterbodies that would be crossed one time by the proposed pipeline (Table 5). The HDD method involves drilling a pilot hole under the waterbody and banks, and then enlarging the hole through successive reaming until the hole is large enough to accommodate a prefabricated pipe segment. Plans for the HDD sites are included in Attachment 1, Site-Specific HDD Crossings.

State	County	Approximate Mile Post	Waterbody Name
Montana	Phillips	25.3	Frenchman Creek
	Valley	83.4	Milk River
	McCone	89.6	Missouri River
	McCone	99.0	West Fork Hungry Creek
	Dawson	198.1	Yellowstone River
	Prairie	220.0	Cabin Creek headcuts
South Dakota	Harding	295.1	Little Missouri River
	Meade/Pennington	429.9	Cheyenne River
	Meade/Pennington	431.0	Ash Creek Bluff
	Haakon	433.6	Bridger Creek
	Haakon	480.8	Ash Creek
	Haakon	486.0	Bad River
	Tripp	541.3	White River
Nebraska	Boyd	618.1	Keya Paha River
	Holt	626.1	Niobrara River
	Antelope	716.3	Elkhorn River
	Madison/Stanton	747.0	Union Creek
	Colfax/Butler	781.0	Platte River
	Seward	808.0	Big Blue River

Table 5Waterbodies and Wetlands Crossed Using the HDD Method

Throughout the process of drilling and enlarging the hole, slurry consisting mainly of water and bentonite clay is circulated to power and lubricate the drilling tools, remove drill cuttings, and provide stability to the drilled holes. Bentonite is a naturally occurring clay that is commonly used in the industry during the drilling process. HDD drilling muds are non-toxic and have been used for decades on many pipeline projects. Material Safety Data Sheets can be provided when a contractor is selected and they determine which drilling mud they would use. HDD drilling muds are not the same as well drilling muds and have no toxic constituents added.

Pipe sections long enough to span the entire crossing would be staged and welded along the construction work area on the opposite side of the waterbody and then pulled through the drilled hole. The HDD method is used to minimize disturbance to the banks, bed, or water quality of the waterbody being crossed. These measures may include, where possible, the drill head advance pace, down-hole pressures, and adjustments to drilling fluid properties (i.e., density, viscosity).

The proposed minimum depth for HDD pipeline sections is 25 feet below the streambed. During HDD construction, an accidental release of pressurized drilling mud from the borehole, or fracout, could potentially occur. In some instances, the pressurized fluids and drilling lubricants may escape the active bore, migrate through the soils, and come to the surface at or near the construction site. Most leaks of HDD drilling fluids occur near the drill entry and exit locations and are quickly contained and cleaned up.

Frac-outs that may release drilling fluids into aquatic environments are more difficult to contain primarily because bentonite readily disperses in flowing water and quickly settles in standing water. While the HDD method poses a small risk of frac-out, potential releases would be contained by BMPs that are described within the HDD contingency plans required for drilled crossings that the pipeline contractor prepares prior to construction. These practices include monitoring the directional drill, monitoring downstream for evidence of drilling fluids, and mitigation measures to address a frac-out should one occur.

Waterbodies considered for directional drill include:

- Commercially navigable waterbodies;
- Waterbodies wider than 100 feet;
- Waterbodies with terrain features that prohibit open crossing methods;
- Waterbodies adjacent to features such as roads or railroads that would complicate construction by an open crossing method; and
- Sensitive environmental resource areas that could be avoided by HDD.

Keystone proposes to use conventional upland cross-country construction techniques in the event these intermittent waterbodies are dry or have non-moving water at the time of crossing. If an intermittent waterbody is flowing when crossed, Keystone would install the pipeline using the open-cut wet crossing method discussed previously. When crossing waterbodies, Keystone would adhere to the guidelines outlined in Keystone's CMRP (see BA Appendix B) and the requirements of its waterbody crossing permits.

Additional TWAs would be required on both sides of all conventionally crossed waterbodies to stage construction, fabricate the pipeline, and store materials. Most of these workspaces would be located at least 50 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. However, workspaces for spoils pile storage and footprints for excavation equipment may need to be as close as 10 feet from the water's edge. Before construction, temporary bridges (e.g., clean fill over culverts, timber mats supported by flumes, railcar flatbeds, or flexi-float apparatus) would be installed across all perennial waterbodies to allow construction equipment to cross (see Section 7.3 in BA Appendix

B, Construction, Mitigation, and Reclamation Plan). Construction equipment would be required to use the bridges, except the clearing crew, which would be allowed one pass through the waterbodies before the bridges are installed.

During clearing, sediment barriers such as silt fence and staked straw bales would be installed and maintained on drainages across the ROW adjacent to waterbodies and within additional TWAs to minimize the potential for sediment runoff. Silt fence and straw bales located across the working side of the ROW would be removed during the day when vehicle traffic is present and would be replaced each night. Alternatively, drivable berms could be installed and maintained across the ROW in lieu of a silt fence.

In general, equipment refueling and lubricating at waterbodies would take place in upland areas that are 100 feet or more from the water. When circumstances dictate that equipment refueling and lubricating would be necessary in or near waterbodies, Keystone would follow its Spill Prevention, Control, and Countermeasure Plan to address the handling of fuel and other hazardous materials (see BA Appendix D, Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan, and Section 3 in BA Appendix B, Construction, Mitigation, and Reclamation Plan).

After the pipeline is installed beneath the waterbody, restoration would begin. Waterbody banks would be restored to preconstruction contours or to a stable configuration. Appropriate erosion control measures such as rock riprap, gabion baskets (rock enclosed in wire bins), log walls, vegetated geogrids, or willow cuttings would be installed as necessary on steep banks in accordance with permit requirements. More stable banks would be seeded with native grasses and mulched or covered with erosion control fabric. Waterbody banks would be temporarily stabilized within 24 hours of completing in-stream construction. Sediment barriers, such as silt fences, straw bales, or drivable berms would be maintained across the ROW at all waterbody approaches until permanent vegetation is established. Temporary equipment bridges would be removed following construction (see Section 7.11 in BA Appendix B, Construction, Mitigation, and Reclamation Plan).

9.13.6. Wetland Crossings

Data from wetland delineation field surveys, aerial photography, and National Wetland Inventory maps were used to identify wetlands crossed by the proposed pipeline. Pipeline construction across wetlands would be similar to typical conventional upland cross-country construction procedures, with several modifications where necessary to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. HDD techniques may be considered in certain sitespecific wetland conditions due to the presence of special-status plant or wildlife species or other factors and would be determined during the Clean Water Act Section 404 permitting process in coordination with the appropriate USFWS office.

The wetland crossing method used would depend largely on the stability of the soils at the time of construction. If wetland soils are not excessively saturated at the time of construction and can support construction equipment without equipment mats, construction would occur in a manner similar to conventional upland cross-country construction techniques. Topsoil would be

segregated over the trench line. In most saturated soils, topsoil segregation would not be possible. Additional TWAs would be required on both sides of particularly wide saturated wetlands to stage construction, fabricate the pipeline, and store materials. These additional TWAs would be located in upland areas a minimum of 10 feet from the wetland edge. More information is located in the Site-Specific Waterbody Crossing Plans in the September 7, 2012, Environmental Report (exp Energy Services 2012).

Construction equipment working in saturated wetlands would be limited to that area essential for clearing the ROW, excavating the trench, fabricating and installing the pipeline, backfilling the trench, and restoring the ROW. In areas where there is no reasonable access to the ROW except through wetlands, non-essential equipment would be allowed to travel through wetlands only if the ground is firm enough or has been stabilized to avoid rutting.

Vegetation clearing in wetlands would be limited to trees and shrubs, which would be cut flush with the ground surface and removed from the wetland. To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation, and excavation would be limited to the area immediately over the trench line to the maximum extent practicable. Situations in which it may be impossible to implement this provision could include crossing of existing utilities, roads, railroads, or streams, in which case extra workspace or the full ROW may be necessary to complete the crossing of that feature after topsoil has been removed. It is also possible that stumps may need to be removed from the working side and/or travel lanes for safety reasons. Trench width would be that required to provide an even safe work area, which depends upon topography, soil moisture content, and groundwater levels. Severe topography may require additional disturbance to create an even safe work area. More saturated soils usually require a wider trench to maintain a safe ditch and to avoid unstable trench walls. During clearing, sediment barriers, such as silt fence and staked straw bales, would be installed and maintained on down slopes adjacent to saturated wetlands and within additional TWAs as necessary to minimize the potential for sediment runoff.

Where wetland soils are saturated or inundated, the pipeline can be installed using the push-pull technique. The push-pull technique involves stringing and welding the pipeline outside the wetland and excavating and backfilling the trench using a backhoe supported by equipment mats or timber riprap. The prefabricated pipeline is installed in the wetland by equipping it with floats and pushing or pulling it across the water-filled trench. After the pipeline is floated into place, the floats are removed and the pipeline sinks into place. Most pipe installed in saturated wetlands would be coated with concrete or installed with set-on weights to provide negative buoyancy. Final locations requiring weighted pipe for negative buoyancy would be determined by detailed design and site conditions at the time of construction.

Because little or no grading would occur in wetlands, restoration of contours would be accomplished during backfilling. Prior to backfilling, trench breakers would be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil would be backfilled first followed by the topsoil. Topsoil would be replaced to the original ground level leaving no crown over the trench line. In some areas where wetlands overlie rocky soil, the pipe would be padded with rock-free soil or sand before

backfilling with native bedrock and soil. Equipment mats, timber riprap, gravel fill, geotextile fabric, and straw mats would be removed from wetlands following backfilling except in the travel lane to allow continued, but controlled, access through the wetland until construction is complete. Upon construction completion, these materials would be removed.

Where wetlands are located at the base of slopes, permanent slope breakers would be constructed across the ROW in upland areas adjacent to the wetland boundary. Temporary sediment barriers would be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers would be removed from the ROW and disposed of properly.

In wetlands where no standing water is present, the construction ROW would be seeded in accordance with the recommendations of the local soil conservation authorities or land management agency.

9.13.7. Fences and Grazing

Fences would be crossed or paralleled by the construction ROW. Before cutting any fence for pipeline construction, each fence would be braced and secured to prevent the slacking of the fence. To prevent livestock passage, the fence opening would be closed temporarily when construction crews leave the area. If pipeline construction creates gaps in natural barriers used for livestock control, the gaps would be fenced according to the landowner's requirements. All existing improvements, such as fences, gates, irrigation ditches, cattle guards, and reservoirs, would be maintained during construction and repaired to preconstruction conditions or better upon construction. For instance, Keystone would restore the land to preconstruction conditions to the extent practicable, but may leave access roads at landowner request.

9.14. ABOVEGROUND FACILITY CONSTRUCTION PROCEDURES

Construction activities at each of the new pump stations would follow a standard sequence of activities: clearing and grading, installing foundations for the electrical building and support buildings, and erecting the structures to support the pumps and/or associated facilities. A block valve would be installed in the mainline with two side block valves; one to the suction piping of the pumps and one from the discharge piping of the pumps. Construction activities and building materials storage would be confined to the pump station construction sites.

The pump stations sites would be cleared of vegetation and graded as necessary to create a level surface for construction vehicle movement and to prepare the area for the building foundations. Foundations would be constructed for the pumps and buildings and soil would be stripped from the construction footprint.

Each pump station would include one electrical equipment shelter, and a variable frequency drive equipment shelter. The electrical equipment shelter would include electrical systems, communication, and control equipment. The variable frequency drive equipment shelter would house variable frequency drive equipment. The crude oil piping, both aboveground and belowground, would be installed and pressure-tested using methods similar to those used for the main pipeline. After testing is successfully completed, the piping would be tied into the main pipeline. Piping installed below grade would be coated for corrosion protection before backfilling. In addition, a cathodic protection system would protect all below-grade facilities. Before being put into service, pumps, controls, and safety devices would be checked and tested to ensure proper system operation and activation of safety mechanisms.

Where delivery and in-line inspection facilities are co-located with a pump station or the tank farm, the delivery and in-line inspection facilities would be located entirely within the facility. Construction activities would include clearing, grading, trenching, installing piping, erecting buildings, fencing the facilities, cleaning up, and restoring the area. The delivery facilities would operate on locally provided power. Construction procedures for electrical transmission and distribution lines and substations are described briefly in Section 11.

Intermediate MLV construction would be carried out concurrently with the pipeline construction. Wherever practical, intermediate MLVs would be located near public roads to allow year-round access. If necessary, permanent access roads or approaches would be constructed to each fenced MLV site.

9.15. CONSTRUCTION WORKFORCE AND SCHEDULE

9.15.1. Workforce

Keystone anticipates a peak workforce of approximately 5,000 to 6,000 construction personnel. Construction personnel would consist of Keystone employees, contractor employees, construction inspection staff, and environmental inspection staff.

Keystone is planning to build the proposed Project in 10 construction spreads. The spread breakdowns are listed in Table 2. The spread configuration is subject to adjustment. The construction schedule may affect the final spread configuration, which may result in the need for additional but shorter spreads. Construction activity would occur simultaneously on spreads within each phased segment of the proposed Project.

It is anticipated that 500 to 600 construction and inspection personnel would be required for each spread. Each spread would require 6 to 8 months to complete. New pump station construction would require 20 to 30 additional workers at each site. Construction of all pump stations would be completed in 18 to 24 months.

Keystone, through its construction contractors and subcontractors, would attempt to hire temporary construction staff from the local population. Provided qualified personnel are available, approximately 10 to 15 percent (50 to 100 people per spread) may be hired from the local workforce for each spread.

9.15.2. Schedule

As an industry rule-of-thumb, cross-country construction progresses at a rate of approximately 20 completed miles per calendar month per spread, which could be used for scheduling purposes. Based on experience, the construction schedule may be estimated as follows:

- Two to three weeks (14 to 21 calendar days) of work on the ROW before production welding starts. These activities include clearing, grading, stringing, and trenching.
- Production welding, based on an average of 1.25 miles per working day and a 6-day work week (7 calendar days), would be completed at 7.5 miles per week, on average.
- Seven weeks (49 calendar days) of work after completing production welding. These activities include non-destructive testing, field joint coating, lowering-in, tie-ins, backfill, ROW cleanup and restoration, hydrostatic testing, reseeding, and other ROW restoration work.

Using this as a basis for determining the duration of construction activities on the ROW yields the following time requirements for various spread lengths (Table 6). Construction in areas with greater congestion, higher population, industrial areas, or areas requiring other special construction procedures, may result in a slower rate of progress.

Spread Length	Pre-welding	Welding Time	Post-welding and Clean-up	Duration
80 miles	21 days	75 days	49 days	145 days (21 weeks)
90 miles	21 days	84 days	49 days	154 days (22 weeks)
100 miles	21 days	94 days	49 days	164 days (24 weeks)
120 miles	21 days	112 days	49 days	182 days (26 weeks)

Table 6Resulting Cross-Country Construction Times Based on Estimates of Schedule

In addition, about 1 month for contractor mobilization before the work is started and 1 month after the work is finished for contractor demobilization should be factored into the overall construction schedule.

9.16. **D**ECOMMISSIONING

PHMSA has requirements that apply to decommissioning crude oil pipelines in 49 CFR 195.402(c)(10), 49 CFR 195.59, and 195.402. These regulations require that for hazardous liquid pipelines, the procedural manuals for operations, maintenance, and emergencies must include procedures for abandonment, including safe disconnection from an operating pipeline system, purging of combustibles, and sealing abandoned facilities left in place to minimize safety and environmental hazards (49 CFR 195.402). Further, these regulations require that for each abandoned onshore pipeline facility that crosses over, under, or through a commercially navigable waterway, the last operator of that facility must file a report upon abandonment of that facility. The report must contain all reasonably available information related to the facility, including information in the possession of a third party. The report must contain the location, size, date, method of abandonment, and a certification that the facility has been abandoned in accordance with all applicable laws.

Keystone would adopt operating procedures to address these requirements for the proposed Project as it has for previous pipeline projects, including the existing Keystone Pipeline. TC Energy typically does not abandon large-diameter pipelines but generally idles or deactivates pipe as market conditions dictate. This allows a dormant pipeline to be reactivated or converted to another purpose in the future, subject to applicable regulatory approvals. When a pipeline or a segment of a pipeline is idled or deactivated, the pipe generally is purged of its contents, filled with an inert gas, and left in place with warning signage intact. Cathodic protection would be left functional, as would other integrity measures such as periodic inspections under the integrity management plan.

The proposed Project pipeline would traverse approximately 44 miles of federal land under the management and jurisdiction of the Bureau of Land Management (BLM); all of this federal land is in Montana. The portion of the proposed Project that would cross BLM-administered land would be subject to the following pipeline decommissioning and abandonment requirements stipulated in the BLM ROW grants and permanent easement permits:

- Boundary adjustments in oil and gas would automatically amend the ROW to include that portion of the facility no longer contained within the above. In the event of an automatic amendment to this right-of way grant, the prior on-lease/unit conditions of approval of the facility would not be affected even though they would now apply to facilities outside the lease/unit as a result of a boundary adjustment. Rental fees, if appropriate, would be recalculated based on the conditions of this grant and the regulations in effect at the time of an automatic amendment.
- Prior to ROW termination, the holder would contact the authorized officer to arrange a predetermination conference to review the grant termination provisions.
- Prior to ROW termination, the holder would contact the authorized officer to arrange a joint inspection of the ROW. This inspection would be held to agree to an acceptable termination (and rehabilitation) plan. This plan would include, but would not be limited to, removal of facilities, drainage structures, or surface material, recontouring, topsoiling, or seeding. The authorized officer would approve the plan in writing prior to the holder's commencement of any termination activities.

The ROW grant on federal lands under the management of BLM for the proposed Project would have a maximum term not-to-exceed 30 years. For the proposed Project to extend beyond 30 years, the approved ROW grant would require a renewal authorization-certification decision by BLM. While there are no state regulations applicable to pipeline decommissioning in Montana, South Dakota, or Nebraska, environmental specifications developed by the Montana Department of Environmental Quality that would address restoration of areas disturbed during abandonment would be required.

Decommissioning activities would be conducted consistent with all applicable regulatory requirements in place at the time of decommissioning. Since regulations at the federal, state, and local level change over time, it would be highly speculative to estimate what regulatory framework would apply to the proposed Project decommissioning at the end of the useful life of the proposed Project more than 50 years in the future.

Prior to decommissioning, Keystone would identify the decommissioning procedures it would use along each portion of the route, identify the regulations it would be required to comply with, and submit applications for the appropriate environmental permits. At that point, Keystone and the issuing agencies would address the environmental effects of implementing the decommissioning procedures and identify the mitigation measures required to avoid or minimize effects. After decommissioning, there would likely be fewer land use restrictions than during operation of the proposed Project since either the ROW would no longer have strict encroachment limitations for protecting the purged pipeline, or the pipeline may have been removed and there would no longer be use limitations of the former ROW.

As noted above, PHMSA regulations require that hazardous liquids pipelines be purged of combustibles prior to decommissioning. Therefore, the potential for contaminants release from the decommissioned pipeline would be negligible.

10. OPERATION AND MAINTENANCE

The proposed Project's facilities would be maintained in accordance with 49 CFR 194, 49 CFR 195, the Project-specific special conditions recommended by PHMSA and agreed to by Keystone, and other applicable state and federal regulations. In most cases, Keystone personnel would operate and maintain the pipeline system. The permanent operational pipeline workforce is estimated at about 20 U.S. employees.

Keystone would implement an annual Pipeline Maintenance Program to ensure pipeline integrity. The program would include valve maintenance, periodic inline inspections, and cathodic protection readings underpinned by a company-wide goal to ensure facilities are reliable and in service. Data collected in each year of the program would be fed back into the decision-making process for developing the following year's program. In addition, the pipeline would be monitored 24 hours per day, 365 days per year from the Operations Control Center (OCC) using leak detection systems and supervisory control and data acquisition (SCADA). During operations, Keystone would have a Project-specific Emergency Response Plan (ERP) in place to manage a variety of events.

10.1. NORMAL OPERATIONS AND ROUTINE MAINTENANCE

Keystone considers that this BA covers the following routine maintenance: periodic ROW mowing in non-agricultural areas, ROW tree clearing, aerial and ground patrols of the ROW, periodic inspections of operating equipment on the ROW (e.g., MLVs, pump stations), and potential excavation of the proposed pipeline within the first 6 months to 2 years for coating and other inspections.

Keystone may need to repair or replace a portion of the proposed pipeline or replace aboveground facilities in the ROW during the operational life of the pipeline. Since the frequency, location, and extent of such activities cannot be predicted with certainty, Keystone would consult with agencies at that time prior to initiating that maintenance work. If an emergency or spill from the proposed pipeline occurs, Keystone would respond to the spill or emergency and then address any effects. Effects would usually be covered under a Natural Resource Damage Assessment conducted by the U.S. Environmental Protection Agency (USEPA).

The pipeline would be inspected periodically via aerial surveillance, as well as limited ground surveillance as operating conditions permit, at a frequency consistent with the requirements of

49 CFR 195 and the Project-specific special conditions. These surveillance activities would provide information on possible encroachments and nearby construction activities, erosion, exposed pipe, and other potential concerns that may affect the safety and operation of the pipeline. Evidence of population changes would be monitored and High Consequence Areas identified as necessary. Intermediate MLVs and MLVs would be inspected twice annually and the results documented.

To maintain permanent easement accessibility and to accommodate pipeline integrity surveys, woody vegetation along the pipeline permanent easement would be periodically cleared. Cultivated crops would be allowed to grow in the permanent easement; however, trees would be removed from the permanent easement. Keystone would use mechanical mowing or cutting along its permanent easement for normal vegetation maintenance. Trees along the paths of areas where the pipe was installed via HDDs would only be cleared as required on a site-specific basis.

The ROW would be monitored to identify any areas where soil productivity has been degraded as a result of pipeline construction, and restoration measures would be implemented to rectify any such concerns. Applicable restoration measures are outlined in the CMRP (see BA Appendix B).

Multiple overlapping and redundant pipeline integrity systems would be implemented, including a Quality Assurance program for pipe manufacture and pipe coating, fusion-bonded epoxy coating, cathodic protection, non-destructive testing of 100 percent of the girth welds, hydrostatic testing to a minimum of 100 percent of the maximum operating pressure, periodic internal cleaning and high-resolution in-line inspection, depth of cover exceeding federal standards, periodic aerial surveillance, public awareness program, SCADA system, and an OCC (with complete redundant backup) providing monitoring of the pipeline every 5 seconds, 24 hours a day, every day of the year.

SCADA facilities would be located at all pump station, remotely operated MLV, and delivery facilities. The pipeline SCADA system would allow the control center to perform the following functions:

- Remotely read automated MLV positions;
- Remotely start and stop at pump stations;
- Remotely read tank levels;
- Remotely close and open automated MLVs;
- Remotely read line pressure and temperature at all automated intermediate valve sites, at all pump stations, and at delivery metering facilities; and
- Remotely read delivery flow and total flow.

The proposed Project would have an OCC staffed by an experienced and highly trained crew 24 hours per day every day of the year. A fully redundant backup OCC would be available as needed.

Real-time information communication systems, including backup systems, would provide up-todate information from the pump stations to the OCC plus the ability to contact field personnel. The OCC would have highly sophisticated pipeline monitoring systems and multiple leak detection systems as discussed above.

10.2. OPERATIONS

Preparing manuals and procedures for responding to abnormal operations complies with the CFR, including 49 CFR 195.402. Section 195.402(a) requires a pipeline operator to prepare and follow a manual of written procedures for conducting normal operations and maintenance activities and handling abnormal operations and emergencies. Section 195.402(d) (Abnormal Operation) requires the manual to include procedures to provide safety when operating design limits have been exceeded.

11. ELECTRICAL TRANSMISSION AND DISTRIBUTION LINES AND SUBSTATIONS

For the new substations, construction would potentially include purchasing land, clearing, grading and leveling, fencing, graveling the site, and installing water management devices for proper drainage. Construction would occur during daylight hours and would likely occur over 6 months. However, seasonal restrictions would be observed for protected species as required.

Construction of transmission and distribution lines would proceed in several steps, starting with engineering surveys and investigations and ending with reclamation and closeout. These engineering surveys, such as geotechnical borings, would provide detailed information for structure location and foundation design. Additional natural resource and cultural resource surveys may be necessary to site structures in a way that reduces effects. Construction would occur during daylight hours and would likely occur over 9 months to a year. Section 3 of the BA discusses effects of the proposed Project activities on habitat and on listed species. Clearing the ROW in preparation for construction would consist of mowing, crop removal, and limited tree and shrub removal to address safety and reliability requirements. Given the open nature of the landscape, it is expected that almost all clearing would be limited to the proposed structure location. Any other ROW clearing would be limited to the creation of TWAs, pulling sites, and the removal of any tall growing vegetation (typically greater than 10 feet high) that could potentially cause risks to the line's overall reliability. In some areas, localized grading could be required if there is a slope or uneven ground. All the necessary material and hardware would be transported and stored at developed areas, such as power provider equipment yards, or within the ROW prior to installation. Pulling and tensioning areas would be established within the ROW and would be restored to natural conditions after construction. No off-ROW access roads or staging areas are planned except for one access road for the line to PS-13.

During the operations and maintenance phase of the proposed Project, each of the transmission and distribution lines would be visually inspected by air, on foot, or by vehicle on a permanent road on an annual or semi-annual basis, depending on the policies of the individual power providers. Given the nature of the landscape, it is unlikely that vegetation management would be necessary beyond limited tree and shrub removal or limbing to maintain reliability. No herbicides would be sprayed along the ROW, though individual stump applications may occur for certain tree species.

11.1. CONSTRUCTION AND OPERATION OF ELECTRICAL TRANSMISSION AND DISTRIBUTION LINES AND SUBSTATIONS

New electrical transmission and distribution lines and substations would be required to power the 19 pump stations required for the proposed Project. Although the final siting and configuration of these lines would be determined by the individual power providers, these lines are discussed here as they relate to the Proposed Federal Decisions and the proposed Project.

For the purpose of this analysis, electric power lines are classified based on their voltage as either transmission (higher than 69 kilovolts [kV]) or distribution (69 kV and lower). Most of the proposed lines would be 115-kV lines strung on a single pole and/or H-frame wood poles. The poles would typically be about 25 to 85 feet high with wire span distances of about 250 to 450 feet. In some cases, a new extension or branch of an existing line would be constructed to reach the pump station. In other cases, new line would be run from an existing substation to the pump station. New or rebuilt electrical substations would be necessary for the lines that would feed PS-09, PS-10, PS-11, PS-13, PS-17, PS-21, and PS-22. Expansions of existing substations would be necessary for the lines that would feed PS-10², PS-13³, PS-15, PS-16, PS-19, and PS-20. A description of the Western Area Power Administration's (WAPA) and Rural Utilities Service's actions related to each of these is provided in Sections 2.2 and 2.3, respectively, of the BA.

The different power providers have sited each proposed line to traverse the shortest, most efficient route that avoids or minimized overlap with environmentally sensitive areas. Minor modifications to each power line may occur during structure (pole) placement to better avoid or minimize effects. Each line would be constructed consistent with national electric safety code standards. Some lines would be constructed in their entirety to be consistent with the Avian Power Line Interaction Committee's (APLIC) guidance, such as that described in *Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006* (APLIC 2006) and, possibly, *Reducing Avian Collisions with Power Lines: The State of the Art in 2012* (APLIC 2012) (see BA Appendix A, Letters of Section 7 Consultation and Supporting Communications). Some other lines would incorporate APLIC guidance along portions of the lines (see BA Appendix A). Power providers may choose to construct and operate the lines to higher standards in order to minimize effects on the environment, including protected species. Additional minor changes to design and routing may result through coordination with appropriate local, state, and federal agencies pursuant to local zoning and laws such as the National Historic Preservation Act of 1966 and the Endangered Species Act.

² PS-10 would require the expansion of an existing substation by Western Area Power Administration (WAPA), and also a new substation near the proposed pump station (the analysis assumes the new substation would require eight acres of ground disturbance).

³ Like PS-10, PS-13 would require the expansion of an existing substation by WAPA, and also a new substation near the proposed pump station (the analysis assumes the new substation would require eight acres of ground disturbance).

12. POTENTIAL SPILLS

Keystone proposes to use a SCADA system to remotely monitor and control the pipeline system. Keystone's SCADA system would include the following highlights:

- Redundant fully functional backup system available for service at all times;
- Automatic features installed as integral components within the SCADA system to ensure operation within prescribed pressure limits;
- Additional automatic features installed at the local pump station level to provide pipeline pressure protection in the event communications with the SCADA host are interrupted; and
- Pipeline monitoring every 5 seconds, 24 hours a day, every day of the year.

Keystone also would have a number of complementary leak detection methods and systems available within the OCC. These methods and systems are overlapping in nature and progress in leak detection thresholds. Leak detection includes the following methods:

- OCC operator remote monitoring, which consists primarily of monitoring pressure and flow data received from pump stations and valve sites fed back to the OCC by the Keystone SCADA system. Remote monitoring is typically able to detect leaks down to approximately 25 to 30 percent of pipeline flow rate.
- Software-based volume balance systems that monitor receipt and delivery volumes. These systems are typically able to detect leaks down to approximately 5 percent of pipeline flow rate.
- Computational pipeline monitoring or model-based leak detection systems that divide the pipeline system into smaller segments and monitor each of these segments on a mass balance basis. These systems are typically capable of detecting leaks down to a level approximately 1.5 to 2 percent of pipeline flow rate.
- Computer-based, non-real time, accumulated gain/loss volume trending to assist in identifying low rate or seepage releases below the 1.5 to 2 percent by volume detection thresholds.
- Direct observation methods, which include aerial patrols, ground patrols, and public and landowner awareness programs designed to encourage and facilitate reporting of suspected leaks and events that may suggest a threat to pipeline integrity.

Appendix Z of the 2014 Final SEIS includes descriptions of best management practices and other measures to mitigate the effects of potential spills. Section 9 of that appendix provides a summary of the measures for listed species. Appendix Z Section 14, Potential Spills, lists the measures for potential releases, and includes a description of the special conditions recommended by the PHMSA.

12.1. Emergency Response Procedures

A Project-specific ERP would be prepared for the proposed Project, which would be submitted to PHMSA for approval prior to commencing system operations. A comprehensive ERP for the existing Keystone Pipeline Project has been reviewed and approved by PHMSA. The publicly available portion of the Keystone Oil Pipeline System ERP is included as BA Appendix D, Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan (parts of the ERP and the Pipeline Spill Response Plan [PSRP] are considered confidential by PHMSA and the U.S. Department of Homeland Security). As described in Section 4.13 of the 2014 Final SEIS, the existing Keystone Oil Pipeline Project documents would be used as templates for the plans for the proposed Project. Project-specific information would be inserted into the plans as it becomes available.

In addition, response equipment would be procured and strategically positioned along the route, staff would be trained in spill response and the Incident Command System, and emergency services and public officials would be educated on all aspects of the proposed Project and what their roles would be if an accidental leak were to occur. If a spill were to occur, Keystone and its contractors would be responsible for recovery and cleanup. PHMSA would require a certification from Keystone that necessary emergency response equipment is available in the event of an unplanned spill prior to providing Keystone with an authorization to begin operating the proposed Project.

The specific locations of Keystone's emergency responders and equipment would be determined upon conclusion of the pipeline detailed design and described in the PSRP and ERP. Company emergency responders would be placed consistent with industry practice and with applicable regulations, including 49 CFR 194 and 49 CFR 195. The response time to transfer additional resources to a potential leak site would follow an escalating tier system, with initial emergency responders capable of reaching all locations within 6 hours in the event of a spill for high volume areas; the spill response for all other areas is 12 hours. Typically, Keystone's emergency responders would be based in closer proximity to the following areas:

- Commercially navigable waterways and other water crossings;
- Populated and urbanized areas; and
- Unusually sensitive areas, including drinking water locations, ecological, historical, and archaeological resources.

The following types of emergency response equipment would be situated along the pipeline route:

- Pick-up trucks, one-ton trucks and vans
- Vacuum trucks
- Work and safety boats
- Containment boom
- Skimmers
- Pumps, hoses, fittings and valves
- Generators and extension cords
- Air compressors
- Floodlights
- Wind socks
- Signage
- Air horns
- Flashlights
- Megaphones

- Fluorescent safety vests
- Communications equipment, including cell phones, two way radios, and satellite phones
- Containment tanks and rubber bladders
- Expendable supplies, including absorbent booms and pads
- Assorted hand and power tools, including shovels, manure forks, sledge hammers, rakes, hand saws, wire cutters, cable cutters, bolt cutters, pliers, and chain saws
- Ropes, chains, screw anchors, clevis pins, and other boom connection devices
- Personal protective equipment, including rubber gloves, chest and hip waders, and airborne contaminant detection equipment

Emergency response equipment would be maintained and tested in accordance with manufacturer's recommendations. These materials would be stored in a trailer; the locations would be determined once the system design is complete and the risk analysis finalized. Additional equipment, including helicopters, fixed-wing aircraft, all-terrain vehicles, snowmobiles, backhoes, dump trucks, watercraft, bulldozers, and front-end loaders could also be accessed depending upon site-specific circumstances. Other types, numbers, and locations of equipment would be determined upon conclusion of the pipeline detailed design and the completion of the PSRP and the ERP for the proposed Project.

Several federal regulations define the notification requirements and response actions in the case of an accidental release, including the 40 CFR 300 (National Oil and Hazardous Substances Pollution Contingency Plan), the Clean Water Act, and Oil Pollution Act of 1990. In the event of a suspected leak or if a spill is reported to the OCC, after verification the operators would perform an emergency pipeline shutdown. Details on the type of verification to be used, what conditions get reported, and what release magnitude would trigger a shutdown are provided in BA Appendix D, Spill Prevention, Control and Countermeasure Plan and Emergency Response Plan.

The emergency shutdown would involve stopping all operating pumping units at all pump stations. The on-call response designate would respond to and verify an incident. Once the OCC notifies the individual and an assessment of the probability and risk is established, field personnel could elect to dispatch other resources as soon as practical. Response efforts would first be directed to preventing or limiting any further contamination of the waterway, once any concerns with respect to health and safety of the responders have been addressed. Other procedures would include

immediate dispatch of a first responder to verify the release and secure the site. Simultaneously, an Incident Command System would be implemented and internal and external notifications would take place.

The National Response Center would be notified immediately in the event of a release of crude oil that violates water quality standards, creates a sheen on water, or causes a sludge or emulsion to be deposited beneath the water surface or upon adjoining shorelines (40 CFR 112). In addition to the National Response Center, timely notifications would also be made to other agencies, including the appropriate local emergency planning committee, sheriff's department, the appropriate state agency, the USEPA, and affected landowners. Keystone must provide immediate notification of all reportable incidents in accordance with 49 CFR Part 195, and must notify the appropriate PHMSA regional office within 24 hours of any non-reportable leaks occurring on the pipeline.

Under the National Contingency Plan, the USEPA is the lead federal response agency for oil spills occurring on land and in inland waters. The USEPA would evaluate the size and nature of a spill, its potential hazards, the resources needed to contain and clean it up, and the ability of the responsible party or local authorities to handle the incident. The USEPA would monitor all activities to ensure that the spill is being contained and cleaned up appropriately. All spills meeting legally defined criteria (see criteria above per 40 CFR 112) must be monitored by the USEPA, even though most spills are small and cleaned up by the responsible party. In the unlikely event of a large spill, Keystone and its contractors would be responsible for recovery and cleanup. The usual role of local emergency responders is to notify community members, direct people away from the hazard area, and address potential effects to the community such as temporary road closings.

12.2. REMEDIATION

Corrective remedial actions would be dictated by federal regulations and enforced by the USEPA, and in some specific situations, the U.S. Coast Guard, PHMSA, and the appropriate state agencies. Required remedial actions may range from the excavation and removal of contaminated soil to allowing the contaminated soil to recover through natural environmental fate processes (e.g., evaporation, biodegradation). Decisions concerning remedial methods and cleanup extent would account for state mandated remedial cleanup levels, potential effects to sensitive receptors, volume and extent of the contamination, potential violation of water quality standards, and the magnitude of effects caused by remedial activities.

In the event of a spill, several federal regulations define the notification requirements and response actions, including the National Oil and Hazardous Substances Pollution Contingency Plan (40 CFR 300), the Clean Water Act, and the Oil Pollution Act. At the most fundamental level, these interlocking programs mandate notification and initiation of response actions in a timeframe and on a scale commensurate with the threats posed. The appropriate remedial measures would be implemented to meet federal and state standards designed to ensure protection of human health and environmental quality.

12.3. PIPELINE INCIDENT ANALYSIS

The revised pipeline incident analysis determined that a 50-barrel (small), 1,000-barrel (medium), or 10,000-barrel (large) spill could spread over land up to 150 feet, 500 feet, or 1,200 feet, respectively. In areas of moderate (greater than 9 percent) to steep (greater than 20 percent) slopes, large spills could travel up to 5,000 feet downslope. However, there are no steep slopes that need to be avoided in the current route alignment, and Keystone would avoid or minimize microadjustments to the route that would lead to an encounter with steep slopes. If a spill reached groundwater, modeling conducted for the 2014 Final SEIS found that some components, such as benzene, could spread an additional 640 feet, 820 feet, or 1,050 feet for a 50-barrel, 1,000-barrel, or 20,000-barrel spill, respectively. The results of modeling data from a worst-case analysis of a release to the Missouri River and information from other major crude oil spills were used to develop a maximum reasonable transport distance of 40 river-miles for reviewing potential downstream effects.

According to nationwide data from 2010 through 2018, onshore crude oil pipelines spilled an average of 574 barrels per thousand miles of pipeline. Over the same period, TransCanada's existing crude oil pipelines in the United States spilled an average of 823 barrels per thousand miles of pipeline and the year with the largest spill, 2017, equaled a rate of 5,050 barrels per thousand miles of pipeline. Although the large spill in 2017 causes the volume spilled per mile-year to be higher for TransCanada than for the industry average in the timeframe analyzed, the frequency of spills of all sizes is higher for the industry average than for TransCanada (Table 7).

	Incident Rate Per	Total Volume of		
Pipeline Operator	Small Spills	Medium Spills	Large Spills	All Spills (barrels)
Industry Average	2.54	0.51	0.07	293,383
TransCanada	0.81	0.14	0.07	7,434

Table 7Incident Rate Summary (2010 through 2018)

A Site-Specific Risk Assessment was prepared by Keystone as part of its Section 408 permit application to the U.S. Army Corps of Engineers for the Keystone XL Project's Missouri River crossing near the Fort Peck Reservoir in Montana (Stantec 2017). The model analysis calculated downstream transport distances of crude oil along the Missouri River under a worst-case discharge scenario, which according to the report, would have a probability of occurring once in 2,230,000 years. The analysis calculated the distance the released crude oil might travel within 6 hours, which is the maximum response time in high-volume areas stipulated by federal pipeline safety regulations in Title 49 CFR Part 194. The downstream transport distance ranged from approximately 0.3 mile (at very low flow) to a maximum worst-case scenario of 33 miles (using record 2011 historic flood conditions) (Stantec 2017). In addition, review of other major oil spill data indicates in most instances, resource impacts primarily occur within the 40 river-mile distance that is used as a maximum reasonable transport distance for reviewing potential downstream effects.
Keystone also prepared a similar site-specific risk assessment for the pipeline's Bear Creek crossing in Montana to further analyze the potential for impacts to the Fort Peck Reservoir (Stantec 2017). The model analysis calculated downstream transport distances of crude oil along Bear Creek under several scenarios, including incidental, small, medium, large, and worst-case discharge scenarios. The analysis calculated the probability of a release of any size occurring at the Bear Creek crossing to be once in 16,600 years, while the probability of a worst-case discharge occurring was calculated to be once in 5,940,000 years. The analysis also calculated maximum transport distance scenarios. The Bear Creek crossing is located 15 stream miles upstream of the mouth of Bear Creek Bay, 20.9 miles upstream of the main portion of the Fort Peck Reservoir, and 22.8 miles and 23.5 miles upstream of the Fort Peck Spillway and Fort Peck Dam, respectively. Unlike the Missouri River, which is a perennial waterbody, Bear Creek is an ephemeral stream that typically has no stream flow to help facilitate downstream movement of crude oil. However, crude oil transport distance modeling was performed under both flow and no-flow conditions. The model determined that maximum downstream transport distance would be 2.0 miles during a noflow scenario. Under a representative high flow scenario, the model estimated that a release would take approximately 3.8 hours to reach Bear Creek Bay, and another 31.4 hours to reach the reservoir. After reaching the reservoir, the same release would take an additional 10.2 to 14.4 hours to reach the Fort Peck Spillway or Fort Peck Dam, respectively. In total, the analysis determined it would take almost 45 to 50 hours for a release at the Bear Creek Crossing to reach the Fort Peck Spillway or Fort Peck Dam.

Continuous scour caused by water currents or other hydrodynamic forces can threaten the integrity of pipelines buried beneath or along water bodies. As part of the U.S. Army Corps of Engineers Section 408 review process (as codified at 33 USC 408), Keystone prepared a Missouri River Scour Analysis on the integrity of the Keystone XL pipeline to withstand scour action at the proposed Missouri River water crossing in Montana. At this crossing location (downstream of the Fort Peck spillway), the pipeline would be installed using HDD for 2,592 feet at a depth of approximately 43 feet below the lowest surveyed river elevation. In accordance with the ERP, pipeline inspections would be conducted following flash flood events to inspect for damage to or exposure of the pipeline caused by soil erosion. The hydraulic model and scour analysis estimated that the 500-year flood frequency event could result in a river-bottom scour depth of 12.7 feet, which would leave 30.3 feet of covering over the pipe. The analysis also considered a worst-case scenario, the equivalent of a 40,000-year event, whereby the Fort Peck spillway outflows exceed design capacity (resulting in a full spillway release) adding an additional 350,000 cubic feet per second of flow. Modeling indicated that this type of event could generate a river-bottom scour depth of 23.5 feet, leaving 19.5 feet of cover over the Keystone XL pipeline. Based on the hydraulic modeling analysis, the report concluded that the current design depth would be adequate to protect against potential scouring.

13. REFERENCES

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

____. 2012. *Reducing Avian Collisions with Power Lines: The State of the Art in 2012*. Edison Electric Institute and APLIC. Washington, D.C.

- exp Energy Services Inc. 2012. TransCanada Keystone XL Pipeline Project: Environmental Report. September 7, 2012.
- Stantec Consulting Services, Inc. 2017. Site-Specific Risk Assessment for Keystone XL Project's Missouri River Crossing. July 31. Prepared for TransCanada Keystone Pipeline LP. Accessed September 25, 2019. Retrieved from: http://kxl.staging.wpengine.com/wpcontent/uploads/2018/07/transcanada-keystone-xl-missouri-river-crossing-site-specificrisk-assessment.pdf
- U.S. Department of State (Department). 2014. *Final Supplemental Environmental Effect Statement for the Keystone XL Project*. January 2014. Accessed January 17, 2019. Retrieved from: https://keystonepipeline-xl.state.gov/documents/organization/221135.pdf

____. 2018. Draft Supplemental Environmental Effect Statement Keystone XL Mainline Alternative Route. September 2018. Accessed January 17, 2019. Retrieved from: https://keystonepipeline-xl.state.gov/documents/organization/286279.pdf.

United States Geological Survey (USGS). 2018. *National Hydrography Dataset*. Accessed February 22, 2019. Retrieved from: https://www.usgs.gov/core-sciencesystems/ngp/national-hydrography/national-hydrography-dataset?qtscience_support_page_related_con=0#qt-science_support_page_related_con.

ATTACHMENT 1

Site-Specific HDD Crossings



			/				2380
							0760
							2360
						+	2340
							2320
	USCS	SOIL CL	ASSIFIC	ATION		11	
· . U]	GW=WELL GI GRAVEL	RADED	14		WATER	_	2300
	GP=POORLY GRAVEL	GRADED	(15)		PEAT	_	2280
	GM=SILTY G	RAVEL	(16)	* * * *	TOPSOIL		2260
	SW=WELL GF SAND	RADED	17		SHALE		
8	SP=POORLY SAND	GRADED		J.	GRAVEL	_	2240
	SM=SILTY S	AND	(19)	· ·	SANDSTON	Ε_	2220
	SC=CLAYEY	SAND	20		SILTSTONE	_	2200
	ML=LOW PL/ SILT	ASTICITY	21		LIMESTONE		
	CL=LOW PLA CLAY	ASTICITY	22		MUDSTONE		2180
	OL=LOW PLA ORGANIC SIL	ASTICITY .T/CLAY	23	\\\\ \\\\\ \\\\\	MARL	$\left \right $	2160
	MH=HIGH PL SILT	ASTICITY	24		CLAYSTONE	Ξ	2140
	CH=HIGH PL CLAY	ASTICITY	25	/	GYPSUM		
	OH=HIGH PL ORGANIC SIL	ASTICITY T/CLAY	26		COAL	_	2120
		70.0					



	12	11	10		9	
G	4200' PULLBACK MAKE-UP AREA ALONG R. 4015' X 25'	D.W. 100' HDD ED LAT: N ² LONG:	КП +8°08'26.19" W106'23'25.63"	H-2-1.01-01	MP B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3 B3	
	- <u>- 20</u>	150' X 50'	Contraction of the second seco	PROPOSED PIPELINE	BH-2-1.01-02	1
F	€ CAR-11 0 200 400 Fee Scale: 1" = 200'	9 et			2	4
E	2220 EXISTING GROUND PROFILE 2200 2180 2180 2160 2140 2140 2140 2140 2120 2120 2120 212	CLASSIFICATION (14) (14) (15) (15) (15) (15) (14) (15) (15) (15) (15) (15) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (16) (1	-119 12 10-101-15 12 12 24			
D	2100 3 GM=SILTY GRAVEL 2100 4 5 SW=WELL GRADED 2080 5 SM=SILTY GRAVEL 2080 5 SM=SILTY GRADED 2060 6 SM=SILTY SAND 2040 7 SC=CLAYEY SAND 2020 9 CL=LOW PLASTICITY CLAY 2000 10 OL=LOW PLASTICITY ORGANIC SILT/CLAY 11 MH=HIGH PLASTICITY	16 TOPSOIL 17 SHALE 18 GRAVEL 19 SANDSTONE 20 SILTSTONE 21 LIMESTONE 22 MUDSTONE 3 MARL COMBINATION COMBINATION COMBINATION COMBINATION COMBINATION COMBINATION COMBINATION COMBINATION CONSTRUCT CONSTRUCT <th>PROPOSED PIPELINE 200 400 EVALUATE STATES AND A PROPOSED PIPELINE 200 FILE IS BASED ON A Feet PROPOSED PIPELINE Feet FOFILE IS BASED ON A N OF AVAILABLE LIDAR DATA AND PROFUSE VERIFIED ONTROL AND BENCHMARK SHALL ONTROL AND BENCHMARK SHALL</th> <th>POINT OF TANGENT BE STA: 53+63.29 ELEV: 2014 69</th> <th></th> <th>24 24</th>	PROPOSED PIPELINE 200 400 EVALUATE STATES AND A PROPOSED PIPELINE 200 FILE IS BASED ON A Feet PROPOSED PIPELINE Feet FOFILE IS BASED ON A N OF AVAILABLE LIDAR DATA AND PROFUSE VERIFIED ONTROL AND BENCHMARK SHALL ONTROL AND BENCHMARK SHALL	POINT OF TANGENT BE STA: 53+63.29 ELEV: 2014 69		24 24
С	1980 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960 1960	r 25 gypsum Y 26 coal Vert. Sc +00 43+00 45+00	Scale: $1'' = 200'$ cale: $1'' = 40'$	51+00 53	+00 55+00 57+0	
	CROSSING INFORMATION (ESTIMATED STATIONING) P.I. 69°24' RT. C STA. 4327+93	43+10.67 HDD EXIT POINT LAT: N48°08'26.19" LONG: W106°23'25.63" 43+71.90 € CAR-119	48+79 BH-2.1.01-01		53+63.29 PT OF TANGENT 56+97.50 € US HWY 2	
B	PIPELINE DATA SEE NOTE 14 -	25'	T			<u> </u>
A	TOPSOIL SALVAGE METHOD STREAMS WETLANDS TIMING CONSTRAINTS MILEPOST MONITORING RECLAMATION					
l	SPECIAL CONSIDERATIONS R DRAWING No 4360-03-ML-02-024 ALIGNMEN	EFERENCE DRAWINGS TITLE T SHEET		REV No DATE 00 2013-05-31 00A 2018-07-12	REVIS	JON DESC



/		12		11			10			9		
G	E	FIELD ROAD			Construction	Contraction of the second seco	CAR-1	2.2		300'	0'	BURIED CABLE
F	0 L Scale:	200 1" = 200	400 Feet		VALI		INTY	BH-2	2-1.02-01	250'		HDD ENTRY LAT: N48'03 LONG: W106
E	2060 2050 2040 2030 2020 2010		USCS SOIL CLAS	SSIFICATION 14 WATER 15 PEAT		EXIST		ROFILE	HDD ENTF STA: 19+ ELEV: 203	9 9 5 0 0 0	L. 1. A6.	
D	2000 (LEATION 1990 1980 1970 1960 1950		M=SILTY GRAVEL W=WELL GRADED AND P=POORLY GRADED AND M=SILTY SAND C=CLAYEY SAND L=LOW PLASTICITY LT L=LOW PLASTICITY CAY RGANIC SILT/CLAY	16 Image: Constraint of the second secon	L			POINT STA: ELEV:	OF CURVATUR 20+44.97 2011.69'	BH-2-1.02-01 (9) (9) (9) (9)		(9) BH-2-1.02-02 (9) (9) BH-2-1.02-02 (9) (9) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10) 0 0 0 (10)
С	1940		H=HIGH PLASTICITY LT H=HIGH PLASTICITY H=HIGH PLASTICITY RGANIC SILT/CLAY 6+00	24 CLAYST 25 GYPSUN 26 COAL 8+00	10+00	12+00	14+00		16+00	5	20+00	22+00
	CROSSING INFORMATION (ESTIMATED STATIONING)	0+00 P.I. 06*40' RT. & STA. 4705+85	E FIELD RD		9+90 R-124/GARWOOD RD. 2				16+34 CAR-124	18+13 BH-2-1.02-01 19+01.44 HDD ENTRY POINT LAT: N48'03'24.98" ONG: W106'19'32.43"	20+44.97 PT OF CURVATURE	 € MAN MADE DITCH € MAN MADE DITCH 22+04 22+07.61 € UNNAMED ROAD
B _	ATAD CONSTRUCTION WORKSPACE	LENGTH SC.	SEE NOTE 15 ALE: N.T.S. 975' x 2	25' -	5 NOTE 16 65' x 25	20°-		E 15	, -	300'		1 7 0
A	ENVIRONMENTAL MITIGATION/RECLAMATION	TOPSOIL SALV STREAMS WETLANDS TIMING CONST MILEPOST MONITORING RECLAMATION	800' × 25'		350'	× 25' 15	50' x 50'		250' x 50'-			D ENTRY
	>	JFEUIAL CUNS	REFERE	INCE DRAWI	NGS							REVISION
	DRAWIN(4360-03-M	G No L-02-030	ALIGNMENT SHEET		TITLE			No 00	DATE 2013-05-3	I ISSUED FOR C	CONSTRUCTIO	DESC
	4360-03-M	L-02-031	ALIGNMENT SHEET	-				00A	2018-07-12	2 ISSUED FOR E	BID	
	TC_UD_BR.DW	G 22X34							1			



		12			11			10			9		
G		P HWY 528		iog 12		1255'	× 60'		31	00'	ВН-2-	·1.31-01	
				500' × 25'		0 P.I. 10°11'LT.			HDD LAT:	ENTRY N47*56'21.21"	,		9Q F
F	0 Scale:	200 $1" = 200$ 7	400 Feet	*		STA. 0+0							
E	2680 2660 2640 2620 2600 2580		USCS SOIL CI W=WELL GRADED RAVEL P=POORLY GRADED RAVEL		WATER	EXISTING GRC	DD ENTRY						7)
D	2560 (1) 2540 NOLEX 2520 2500 2480 2460		M=SILTY GRAVEL W=WELL GRADED AND P=POORLY GRADED AND M=SILTY SAND C=CLAYEY SAND L=LOW PLASTICITY L=LOW PLASTICITY CAY L=LOW PLASTICITY H=HIGH PLASTICITY LT		TOPSOIL SHALE GRAVEL SANDSTONE SILTSTONE LIMESTONE MUDSTONE MARL CLAYSTONE		IA: 3+36.12 LEV: 2606.7	POINT OF STA: 6+2 ELEV: 253	CURVATI 8.25 33.94' PRC	URE	John State	BH-2-1.31-01	19 22 24 19 19 19 19 19
С	2440 2420 	12 Cr 13 Or 3+00	H=HIGH PLASTICITY AY H=HIGH PLASTICITY RGANIC SILT/CLAY -6+00	25 / c 26 c -4+00	GYPSUM COAL -2+00	0+00	2+0	0	4+00	6+00	8+00	10+00	POIN STA: ELEV 12+00
	CROSSING INFORMATION					0+00 P.I. 10°11' LT. € STA. 5241+99		3+36.12 HDD ENTRY POINT LAT: N47*56'21.21"	-ONG: W10613'30.42"	6+28.25 PT OF CURVATURE		10+89 BH-2-1.31-01	
Β	PIPELINE ATA CONSTRUCTION WORKSPACE	165 165			W.T., API 5L PS	5L 2-X70M W/ 1 1255'	HDD ENTRY		3				36
A	ENVIRONMENTAL MITIGATION/RECLAMATION	TOPSOIL SALV STREAMS WETLANDS TIMING CONST MILEPOST MONITORING RECLAMATION SPECIAL CONST	AGE METHOD										
	DRAWING	G No	REFE	RENCE DF	RAWINGS TITLI	E			REV	DATE		RE	/ISION DESC
	4361-03-M	L-02-001	ALIGNMENT SH	EET					00	2013-05-31 2018-07-12	ISSUED FOR C		
									00B	2018-12-01	ISSUED FOR N	IULTI-DISCIPLINE	REVIEW
			1							L	1		

TC_UD_BR.DWG 22X34





	12	11	10	9	
G	PRAIRIE COUNTY	And	0 178' 00 00 00 00 00 00 00 00 00 00 00 00 00	BH-2-1.32-01 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-2-1.32 BH-	
F	0 $300Scale: 1" = 300'$	25' x 50' 600 Feet	HDD ENIRT LAT: N46'39'45.62" LONG: W104'40'31.52"		
	USCS_SOL USCS_SOL USCS_SOL CW=WELL GRADEL GRAVEL CP=POORLY GRAGE CM=SILTY GRAVE CM=SILTY SAND CL=LOW PLASTIC CL=LOW PLASTIC CL=LOW PLASTIC	CLASSIFICATION WATER 14 WATER DED 15 16 TOPSOIL 17 SHALE DED 18 GRAVEL 9 19 SANDSTONE SILTSTONE HDD ENTRY STA: 1+70.34 ELV 26 MUDSTONE STA:			
D	2640 2640 2640 10 10 0C=LOW PLASING ORGANIC SILT/CL 0RGANIC SILT/CL 11 12 CH=HIGH PLASING CLAY 0H=HIGH PLASING 0RGANIC SILT/CL 12 0H=HIGH PLASING 0RGANIC SILT/CL 0RGANIC SILT/CL 12 0H=HIGH PLASING 0RGANIC SILT/CL 0RGANIC SILT/CL	AY 23 ARL ARL ARL ARL ARL CLAYSTONE CL	9 9 9 19 24 24 19 19 19 19 19 19 19 19 19 24 24 24 24 24 24 24 24 24 24 24 24 24	$ \begin{array}{c} $	24 24 24 24 19 -24 -24 -24 -24 -24 -24
С	2520 GROUND PROFILE IS BASE COMBINATION OF AVAILABLI CIVIL SURVEY DATA. PRIOR VERTICAL CONTROL AND B ESTABLISHED AND PROFILE Horiz. Scale: 1" 2440 -12+00 -10+00 -8+00	D ON A E LIDAR DATA AND TO CONSTRUCTION ENCHMARK SHALL BE VERIFIED. ' = 300' = 60' -6+00 -4+00 -2+00 0+00	L=628'- 3600' RADIUS 2+00 4+00 6+00 8+	-00 10+00 12+00 14+0	TANGENT 56.32 9.92 00 16+00 18+00
	CROSSING INFORMATION	0+00 P.I. 7'38' RT. & STA. 11600+28	HDD ENTRY POINT LAT: N46'39'45.62" DNG: W104'40'31.52" ONT OF CURVATURE 6+07 BH-2-1.32-01	10+56.32 POINT OF TANGENT 10+63 BH-2-1.32-02	17+27 BH-2-1.32-03 17+80.94 HORIZONTAL POINT OF CURVATURE
B	PIPELINE DATA	API 5L PSL 2-X70M W/ 14-20 MILS FBE			36" O.D. X
A	TOPSOIL SALVAGE METHOD STREAMS WETLANDS TIMING CONSTRAINTS MILEPOST MONITORING RECLAMATION SPECIAL CONSIDERATIONS		540' x 80'		
lD	DRAWING No 4363-03-ML-02-013 ALIGNMEN 4363-03-ML-02-014 ALIGNMEN	LFERENCE DRAWINGS TITLE IT SHEET	REV 00 00A 00B	DATE 2013-05-31 ISSUED FOR CO 2018-07-12 ISSUED FOR BID 2018-11-05 ISSUED FOR MU	REVISION DESC





TC_UD_BR.DWG 22X34

8			7			6			5		4	
	<u> </u>	A V	4995'	ll .								
1.11		陷	<i>,</i>			16						
1.14												1.2
RIVER	& PROPOSED F	PPELINE	101.50		Ŷ				1			
CHEYENNE		- CAL	in find	·								1 i a 4 i a
e e e e e e e e e e e e e e e e e e e	A Carl		and a second			1		PENN	NINGTON CO	UNTY		
		45 JA	11 h 2 1		1. 1. 1			-			A	•
	4995' HORIZ	ZONTAL DISTA	NCE									
LE RIVER	5009	HDD LENGTH										
CHEYENN	CHEYENNE	RIVER										
- لدی	STA: 22+61.9	98 0'										
												L=628 3600' R
	L	=3265'										POINT
									P S E	OINT OF CUR TA: 42+14.23 LEV: 1820.00		STA: 4 ELEV:
		USCS SOIL	CLASSIFICATION									
9 (10	CL=LOW PLASTICITY CLAY OL=LOW PLASTICITY ORGANIC SILT/CLAY		OH=HIGH PL ORGANIC SIL	ASTICITY T/CLAY (17 SHA 18 GRA	LE VEL	(21)		(i (i	25) / / GYP 26) COA		
	MH=HIGH PLASTICITY SILT			(19 SAN	DSTONE		MARL				
	CH=HIGH PLASTICITY CLAY			(20 SILT	STONE	24 ////	CLAYSTONE				
22+00	24+00	26+00	28+00	30+00) 32+	00 32	++00	36+00	38+00	40+00	42+00	44+00 46+
-61.98 ENNE RIVEF											-14.23 SURVATURE	
22+ € CHEYE											42+ PT 0F 0	
API 5L PSL 2-2	X70M W/ 14-20	MILS FBE &	16-20 MILS A	RO (NOT TO	EXCEED 40 M	ILS TOTAL) —						
			PERMANENT	EASEMENT								
		ł										
			S	EE ALIGNMENT	SHEET							
			S	EE ALIGNMENT	SHEET SHEET							
			S	EE ALIGNMENT	SHEET							
			S S	EE ALIGNMENT	SHEET SHEET SHEFT							
RIPTION			PROJECT	DRAFTER	DRAFTING CHECKFR	APPROVAL designer	- DESIGN CHECKFR	PROJECT MANAGER	COMPANY	PROFESSI	ONAL ENGINEER/RPT	PERMIT/ E
			2095406 2095406	EXP EXP	TLB ADH	BLS	KJM REW	KJM SAS	EXP EXP	FIRM	LICENSE: C-6263	
			2095406	EXP	ADH	JMP	REW	SAS	EXP			
										REV. NO.	DATE	PERMIT NUMBER:

PLOTTED SIZE: ANSI D (22x34)

_ HEADCUT AREA

REV 00B/

		12		11		10			9		
G	o L Scale:	200 1" = 2	400 Feet			OVERHEAD POWERLINE		STA. 0+00 P.I. 8°35' RT. 5TA. 0+00 P.I. 8°35' RT. 6. STA. 28584+20	HDD LAT: LON	ENTRY N43'42'30.3 G: W100'10'1	4" 3.50" BH
F		WREAD	WATER LINE	W W		EENO		LY	100' 50' E	unty	CAR-080
E	1680 1660 1640 1620 1600 1580		USCS SOIL CL GW=WELL GRADED GRAVEL GP=POORLY GRADED GRAVEL GM=SILTY GRAVEL SW=WELL GRADED SAND SP=POORLY GRADED SAND SM=SILTY SAND SC=CLAYEY SAND	ASSIFICATION 14 15 15 16 17 18 18 19 SANDSTONE 20		EXISTING GROU	UND PROFILI HDD EI STA: 0 ELEV:	NTRY		بېدل BH-2-1.06-01	
D	1560 (Leel) 1540 1520 1500 1480	8 9 10 11 12 13	ML=LOW PLASTICITY SILT CL=LOW PLASTICITY CLAY OL=LOW PLASTICITY ORGANIC SILT/CLAY MH=HIGH PLASTICITY SILT CH=HIGH PLASTICITY CLAY OH=HIGH PLASTICITY ORGANIC SILT/CLAY	21 LIMESTONE 22 MUDSTONE 23 MARL 24 CLAYSTONE 25 GYPSUM 26 COAL				POINT OF STA: 2+9 ELEV: 15	INE		
С	1460 1440 1420	Horiz. So -Vert. Sc -14+00	cale: $1" = 4$ ale: $1" = 4$ -12+00	0 20 GROUND PROFILE COMBINATION OF CIVIL SURVEY DAT VERTICAL CONTRC ESTABLISHED AND -10+00 -8+0	00 400 Feet IS BASED ON A AVAILABLE LIDAR DATA TA. PRIOR TO CONSTRU DL AND BENCHMARK SHO PROFILE VERIFIED. 0 -6+00	AND JCTION IALL BE -4+00	-2+00	0+0	D 2+	00	4+00
	CROSSING CROSSING INFORMATION (ESTIMATED STATTONING)							0+00 P.I. 8°35' RT. € STA. 28584+20	HDD ENTRY POINT LAT: N43'42'30.34" LONG: W100'10'13.50"	2+92.68 PT OF CURVATURE 3+95	BH-2-1.06-01
B 	ATA ATA CONSTRUCTION WORKSPACE		36" O.D. CALE: N.T.S.	X 0.515" W.T., API 5L PSL 2	2-X70M W/ 14-20 MILS	FBE		- 28 28 28 25		HDD E	O.D. X 0.748" W.
А	ENVIRONMENTAL MITIGATION/RECLAMATION	STREAMS WETLANDS TIMING CONS MILEPOST MONITORING RECLAMATION	TRAINTS								
-	DRAWIN 4369-03-M 4369-03-M	G No L-02-027 L-02-028	ALIGNMENT SHEE	ENCE DRAWINGS TITLE			REV No 00 2 00A 2	DATE 2013-05-31 2018-07-12	ISSUED FOR C ISSUED FOR E	CONSTRUCTION	REVISION DESC
 	TC UD BR DW	/G 22X34									

INSTALLATION NOTES

- ACCESS: ALL EQUIPMENT MUST ACCESS THE SITE ALONG THE CONSTRUCTION RIGHT-OF-WAY FROM PUBLIC OR APPROVED PRIVATE ROADS.
- VEHICLE AND EQUIPMENT ACCESS CROSSING MAY BE INSTALLED IF APPROVED BY THE COMPANY REPRESENTATIVE AND APPROPRIATE REGULATORY AGENCIES.
- 3) WORKSPACE: WORKSPACE LIMITS ARE DEPICTED. CLEARING WILL BE RESTRICTED TO THE WORKSPACES INDICATED AT THE ENTRY AND EXIT POINTS AND PULLBACK MAKE UP AREA ALONG THE RIGHT-OF-WAY. NO CLEARING BETWEEN THE ENTRY AND EXIT POINTS OF THE HDD EXCEPT WHERE APPROVED BY THE COMPANY REPRESENTATIVE AND APPROPRIATE REGULATORY AGENCIES.
- WATER SOURCE: DRILL WATER AND PRE-INSTALLATION HYDROSTATIC TEST WATER SHALL BE OBTAINED FROM AN APPROVED SOURCE. THE CONTRACTOR SHALL SCREEN THE INTAKE HOSE TO PREVENT THE ENTRAINMENT OF FISH OR DEBRIS AND IN ACCORDANCE WITH THE LIQUID PIPELINE CONSTRUCTION SPECIFICATION (LPCS) AND PROJECT REQUIREMENTS. THE HOSE SHALL BE KEPT OFF THE BOTTOM OF THE WATERBODY.
- 5) HYDROSTATIC TEST: PRE-INSTALLATION HYDROSTATIC TEST SHALL BE CONDUCTED IN ACCORDANCE WITH PERMIT REQUIREMENTS. THE CONTRACTOR SHALL DISCHARGE HYDROSTATIC TEST WATER IN ACCORDANCE WITH PROJECT PERMITS. DISCHARGES WILL BE SENT TO AN UPLAND LOCATION NEAR THE WITHDRAWAL POINT AS DIRECTED BY THE COMPANY REPRESENTATIVE AND APPROPRIATE REGULATORY AGENCIES. DISCHARGES SHALL NOT CAUSE EROSION OR SEDIMENTATION. TO REDUCE THE VELOCITY OF THE DISCHARGE, THE CONTRACTOR SHALL UTILIZE AN ENERGY-DISSIPATING DEVICE AS DESCRIBED IN THE LPCS.
- 6) SPILL-PREVENTION: ALL PUMPS SHALL BE SET IN SECONDARY CONTAINMENT AND IN ACCORDANCE WITH THE SPILL PREVENTION CONTROL AND COUNTERMEASURE PLAN (SPCC). EQUIPMENT AND PUMPS OPERATING WITHIN 100 FEET OF ANY WATERBODY OR WETLAND SHALL BE OPERATED AND REFUELED IN ACCORDANCE WITH THE SPCC PLAN. EQUIPMENT REFUELING AND STORAGE OF HAZARDOUS MATERIALS, FUELS, ETC. SHALL BE CONDUCTED AT LEAST 100 FEET FROM WATER BODIES AND WETLANDS. EACH CONSTRUCTION CREW SHALL HAVE ON HAND SUFFICIENT TOOLS AND MATERIALS TO STOP LEAKS AND SUPPLIES OF ABSORBENT AND BARRIER MATERIALS TO ALLOW RAPID CONTAINMENT AND RECOVERY OF SPILLED MATERIALS.
- 7) EROSION AND SEDIMENT CONTROL: CONTRACTOR SHALL SUPPLY, INSTALL AND MAINTAIN SEDIMENT CONTROL STRUCTURES IN ACCORDANCE WITH CONTRACT DOCUMENTS. CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL STRUCTURES AS DIRECTED BY THE COMPANY REPRESENTATIVE AND APPROPRIATE REGULATORY AGENCIES.
- 8) PRIOR TO PIPE PULLBACK, CONTRACTOR'S ACTUAL DRILL PROFILE SHALL BE SUBMITTED TO THE COMPANY REPRESENTATIVE AND APPROPRIATE REGULATORY AGENCIES FOR APPROVAL.
- THE CONTRACTOR HAS TO PROVIDE PLANNED DRILL PROFILE TO COMPANY PRIOR TO STARTING THE PILOT HOLE.
- 10) INSTALLATION: THE PIPE SECTION FOR THE DRILLED CROSSING SHALL BE MADE UP WITHIN THE RIGHT-OF-WAY AT THE DRILL EXIT POINT AS SHOWN. CONTRACTOR SHALL ASSESS THE NEED FOR AND SUPPLY APPROPRIATE BALLAST DURING PULLBACK. PIPING FOR BALLAST MUST BE IN CONTINUOUS ROLL (NOT JOINTS) UNLESS APPROVED BY THE
- 11) MUD DISPOSAL: CONTRACTOR SHALL DISPOSE OF EXCESS DRILLING MUD AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS. UNDER NO CIRCUMSTANCES SHALL DRILLING FLUID BE DISPOSED OF IN WATERBODIES OR WETLANDS. ANY DRILLING MUD WHICH INADVERTENTLY EXITS AT POINTS OTHER THAN THE ENTRY AND EXIT POINTS SHALL BE CONTAINED AND COLLECTED TO THE EXTENT PRACTICAL AND DISPOSED OF AS DIRECTED BY THE COMPANY REPRESENTATIVE IN ACCORDANCE WITH PERMIT CONDITIONS.
- 12) CLEANUP/STABILIZATION/RESTORATION: ALL DISTURBED AREAS SHALL BE RETURNED TO THE ORIGINAL CONTOURS. DISTURBED AREAS SHALL BE SEEDED AS SPECIFIED IN PROJECT DOCUMENTS.
- 13) CONTRACTOR SHALL FOLLOW REFERENCE SPECIFICATIONS. REFER TO LPCS, LIQUIDS PIPELINE CONSTRUCTION SPECIFICATIONS, PROJECT ENVIRONMENTAL REQUIREMENTS FOR THIS SITE SPECIFIC DETAIL, PART 195 OF THE CODE OF FEDERAL REGULATIONS (LATEST EDITION), ASME B31.4, AND API 1102.
- 14) WALL THICKNESS TRANSITION FROM THE 0.748-INCH W.T. HDD PIPE TO THE LINE PIPE SHALL BE MADE USING 0.618-INCH W.T. COATED WITH FBE AND ARO, 8 FEET IN LENGTH. THE 0.618-INCH WILL BE JOINED BY 0.515-INCH PIPE UPSTREAM AND DOWNSTREAM FOR THE ENTRY AND EXIT VERTICAL FIELD BENDS.
- 15) 36" O.D. X 0.515" W.T., API 5L PSL 2-X70M W/ 14-20 MILS FBE
 16) TREE CLEARING WILL BE MINIMIZED THROUGH NARROWING OF THE CONSTRUCTION RIGHT-OF-WAY, AND FINAL CENTERLINE LOCATION NEAR CROSSING OF THE STREAM.

				I EGEND	
·····	www.e		CL P.I.		
			BOREHOLE	PROPERTY PARCEL	
		Z .	 PIPELINE ROUTE CATHODIC PROTECTION TEST STATION 	SECTION LINE COUNTY LINE	
			- ROAD CL		r
			— ROAD EDGE	BOUNDARY	~
			- FIELD PATH	WORKSPAC BOUNDARY	E
			- FENCE	PERMANENT	
			FOREIGN	ACCESS RO TEMPORARY	DAD Y
				ACCESS RO	DAD
			OVERHEAD	GROUND	
		P_	POWERLINE		
		_		BOUNDARY	
NG. APPROVAL		I	EXP Energ	y Services Inc.	
		4~	t: +1.850.385.544 1300 Metropolitan Tallabassee EL	1 f: +1.850.385.5523 Blvd 32308	
DATE	Irans Callac	bl	USA		
			www.exp.com		-
	KEYSTO)NE XL (NPS 36) C	COLOME SECTION	1
	FIA # 4479 CHAINA	AGE:	MP 618.58	3	DISCIPLINE # 03
	KEYA PAF	ia riv	ER HD	DINSIALL	ATION
	KE`	YSTON	IE XL	PROJECT	
	BOY	D COI	JNTY, I	NEBRASKA	
	- SCALE DRAWING I	No 4479	9-03-M	L-03-001	REV
L REVISIONS		PLOTTE	ED SIZE: A	NSI D (22x34)	

	12	11	10	9	
G		+00 P.I. 4°53' RT. ??+??		300'	ВН-2-1.08-02
		STA. 0+ E STA.			T
			20' 4		*
F			HDD ENTRY		BH-2-1.08-0
			LAT: N42 50 5 LONG: W99*07	7'45.80"	
		and the second	S. F. C.		TAKE
)0 Feet			31.00
	Scale: 1" = 200'	E	BOYD COUNTY		
E	1800				
	1780 1780 SW=WELL GRADE GRAVEL				
	1760 2 GP=POORLY GRA	DED (15) PEAT			
	1740				
		NDED (18) GRAVEL			
Γ	Image: Solution of the second seco	(19) SANDSTONE	EXISTING GROUND PROFILE	io I	
	TTOO TOTAL SAN				
	1680 8 ML=LOW PLASTIC		200 400 ST	DD ENTRY A: 9+20.46	³⁰ 6,
	1660 9 CL=LOW PLASTIC CLAY OL=LOW PLASTIC			EV: 1702.80	
	1640	AY (23) AND FR AVAILABLE L CITY (24) CLAYSTONE N.E.D. DATA	JDAR DATA AND CIVIL SURVEY DATA, TED WITH 10M AND 30M RESOLUTION WHERE REQUIRED.	N POINT OF CURVA	
	1620 12 CH=HIGH PLAST		cale: $1" - 200'$	ELEV: 1649.70'	360
С	1600 13 OH=HIGH PLASTI ORGANIC SILT/CL	$\begin{array}{c} \text{CITY} \\ \text{LAY} \end{array} \begin{array}{c} \hline 26 \end{array} \begin{array}{c} \hline \\ \hline \\ \hline \\ \hline \\ \end{array} \begin{array}{c} \text{COAL} \end{array} \begin{array}{c} \hline \\ \hline \\ \hline \\ \hline \\ \end{array} \begin{array}{c} \text{Vert.} \\ \hline \\ \end{array} \begin{array}{c} \\ \end{array} \end{array}$	Scale: 1" = 200		
	-6+00 -4+00	-2+00 0+00 2+0	00 4+00 6+00	8+00 10+00	12+00 14+00
		3' RT. ??+??			-81 -08-01 -1.70 -11.70 -11.70 -08-02 -08-02
	CROS INFORM STATIO	0+- 6 STA. 51A.		9+20 DD ENTF 	11+ 12+2 1 OF CL BH-2-1
	PIPELINE			I S G	<u>۵</u>
В	DATA LENGTH SCALE: N.T.S	36 U.D. X U.STS W.T., APT 5L 2-X70M S.	W W/ 14-20 MILS FBE	NOTE 14 300'	
	CTION				Ŧ
	MORKS CONSTRU				
			· · · · · · · · · · · · · · · · · · ·		HDD ENTRY
	STREAMS				
А	TIMING CONSTRAINTS				
	MILEPOST				
	A LE MONITORING RECLAMATION				
	SPECIAL CONSIDERATIONS	SEFERENCE DRAWINGS			REVISION
	DRAWING No	TITLE	RE	DATE	DESC
	4479-03-ML-02-017 ALIGNME	NT SHEET	00,	2013-11-01 ISSUED FOR A 2017-02-03 ISSUED FOR	CONSTRUCTION REVIEW
- - -					

		The second s				THE PARTY OF				CRASSING ST		
4375' HORIZONTAL D	ISTANCE											
4388' HDD LENG	TH											
		TOP OF BANK	TOE OF BANK							∕–ିହ ୯ନ	EEK	
			-TOP OF BAN	NK					/	<u></u>		
										<u> </u>		
			6-6-6									5
				5)								
				20								
			m L	24)								μ ^{6^λ}
				7)							· ·	
			HE HE									
				17)								
								L=50	DIUS		STA:	77+12.90
								3600			ELEV:	1327.00
L=2558'							1					
					POINT O	- CURVATURE -						
					STA: 72- ELEV: 12	+11.87 92.62						
	ASSIFICATION							7				
(9) CL=LOW PLASTICITY (13) CLAY	ORGANIC SILT/CLAY	(17)	SHALE			IESTONE	(25)	GYPSUM				
	WATER	(18)			(22) MU	DSTONE	(26)	COAL				
			<u>>(</u>				0					
	PEAT	(19)		Ξ	(23) MA	RL						
12 CH=HIGH PLASTICITY (16)	TOPSOIL	20	SILTSTONE		(24) (///) CL	AYSTONE						
00 57+00 59+00 6	61+00 6	3+00	65+00	67+00	69+00	71+00	73+()0 75	+00 7	7+00	79-	+00
							RE			5		
			4 8 - 3 2				.87 WATU		90 90	NGEN		2 8 - 4
			-1.0				CUR CUR		+ 36 CRE + 12	TA .		79+9 -1.0
			BH				72 0F		۲ 20 20	, 5 L		BH
							Ы			<u>م</u>		
D. X 0.748 W.I., API SL PSL 2-X/UM W/ 14-20	MILS FBE & 10-	ZU MILS ARU (N		40 MILS TOTAL)								
— LIMI	I OF PERMANENT	EASEMENT										HDD E
/////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////////_///_////	////	////	///	// //	////	////	////	////	//////	//-	//	_//
Ť												
	S	EE ALIGNMENT	SHEET									
	S											
	ے د											
	S											
	S	EE ALIGNMENT S	SHEET									
	S	EE ALIGNMENT S	SHEET									
	S	EE ALIGNMENT S	SHEET									
	S	EE ALIGNMENT S	SHEET									
			,	APPROVAL	_			PROFESSIO	NAL ENGINEER	/RPT	f	PERMIT/
CRIPTION	PROJECT	DRAFTER	DRAFTING	DESIGNER	DESIGN		COMPANY	FIRM: EXP E	ENERGY SERVICE	S, INC.		
	2095406	EXP	TLB	UUD	KJM	KJM	EXP	FIRM LICENS	E: CA-2224			
	2095406	EXP	ADH	ОТВ	REW	SAS	EXP					
										I		
							,	REV. NO.	DATE		PERMIT	NUMBER
	1	1	1	1	1	1	· /					

PLOTTED SIZE: ANSI D (22x34)

PLOTTED SIZE: ANSI D (22x34)

APPENDIX D

Spill Prevention, Control and Countermeasures (SPCC) Plan and Emergency Response Plan (ERP) -Page intentionally left blank-

Keystone XL Pipeline Project Spill Prevention, Control and Countermeasure Plan

Note: This document is a template for the Project's Spill Prevention, Control and Countermeasure Plans and will be finalized by each contractor based on all required site-specific information.

Table of Contents

1	Intr	troduction	1
	1.1	Scope	1
2	Cor	ontractor Supplied Site-Specific Information	1
3	Pre	evention	2
	3.1	Training	2
	3.2	Site Security	3
	3.3	Equipment Inspection and Maintenance	3
	3.4	Materials Storage and Handling	4
	3.4.	4.1 Tanks	4
	3.4.	4.2 Containers	5
	3.4.	4.3 Concrete Coating	6
	3.4.	4.4 Disposal of Solid and Hazardous Wastes	6
	3.4.	4.5 Equipment Refueling and Servicing	6
	3.4.	4.6 Spill Response Equipment	7
	3.4.	4.7 Activities in Environmentally Sensitive Areas	8
4	Spi	bill Control and Countermeasures	8
5	Doc	ocumentation and Reporting	8
6	Insp	spection and Record Keeping	9
7	Арр	oplicable State Requirements	9
8	Cer	ertification of Non-Substantial Harm	. 10
At	tachm	ment A SPCC Cross Reference Table	
At At	tachm	nent B Contractor Yard or Fueling Station Facility Diagram ment C Hazardous Materials Inventory and Reportable Quantities	
At	tachm	ment D Contractor's Training Program	
At At	tachm	nent E Emergency Response Contacts nent E Contractor's Emergency Response Procedures	
At	tachm	nent G Contractor's Commitments	
At At	tachm	nent H Professional Engineer's Certification	
At	tachm	nent J Contractor's Material Safety Data Sheets (MSDS)	
At	tachm	ment K Typical Layouts; Fuel Transfer Stations	
At	tachm	nent M Certification of the Applicability of the Substantial Harm Criteria	

1 Introduction

The purpose of this Spill Prevention, Control and Countermeasure (SPCC) Plan is to establish procedures to prevent the discharge of hazardous or regulated materials during construction of the Keystone XL Pipeline Project (Project), particularly into or upon Waters of the U.S. The SPCC Plan is designed to reduce the likelihood of a spill, provide for prompt identification and proper removal of contaminated materials if a spill does occur, comply with applicable state and federal laws (e.g., Title 40 Code of Federal Regulations [CFR] Parts 112 and 122) and Project permits, and to protect human health and the environment. The SPCC Plan is designed to complement existing laws, regulations, rules, standards, policies and procedures pertaining to safety standards and pollution rules, in order to minimize the potential for unauthorized releases of hazardous materials, fuels and lubricants.

TransCanada Keystone Pipeline, L.P. (Keystone) anticipates that the Project Pipeline construction contactor (Contractor) will store or handle more than the threshold quantities of oil products and will therefore be subject to federal SPCC preparation requirements. In conformance with federal regulations, a cross-reference table is provided in **Attachment A** that lists the relevant sections in Title 40 CFR 112.7 and the equivalent sections in this SPCC Plan.

Amendments to the SPCC Plan will be made as necessary during construction to account for increases in the volumes of materials stored or other changes associated with the handling or storage of hazardous materials.

1.1 Scope

This SPCC Plan applies to all construction and reclamation activities on the Project, but does not cover pipeline or pump station operations or maintenance. The Keystone XL Project Emergency Response Plan will contain the SPCC requirements for operation and maintenance of the pipeline and pump stations.

This plan outlines the procedures for prevention, containment, and control of potential spills during Project construction and reclamation. The SPCC Plan applies to the use of hazardous materials on the right-of-way and all ancillary facilities. This includes the refueling or servicing of all equipment with diesel fuel, gasoline, lubricating oils, grease, hydraulic and other fluids during normal upland work and for special applications located within 100 feet of streams and wetlands. In addition, site-specific information to be provided by the Contractor is identified and will be attached to the document.

This document is not a complete summary of all requirements. The Contractor is responsible for thoroughly researching, understanding, and complying with all applicable federal, state, and local requirements related to all aspects of work on the Project, including polluting, toxic, and hazardous materials handling, storage, transportation, spill prevention, clean-up and disposal, documentation, notification, hazardous waste, and training.

2 Contractor Supplied Site-Specific Information

This document is a template for the Project's SPCC Plans and will be finalized by each contractor based on all required site-specific information.

The following information must be supplied by the Contractor for review and approval by Keystone at least 30 days prior to construction activities.

- Contractor yard or fueling station facility diagram (**Attachment B**) showing at a minimum the following:
 - o storage tanks, including content and capacity;

- mobile portable containers that store 55 gallons or more (including contents and capacity);
- oil-filled equipment, electrical transformers, circuit breakers, etc. that store 55 gallons or more;
- o any other oil-filled equipment (including content and capacity);
- o oil/fuel transfer area;
- o secondary containment structures;
- o storm drain inlets and surface waters that could be affected by a discharge;
- direction of flow in the event of a discharge (topography) and potential receiving waters;
- o legend that indicates scale and identifies symbols used in the diagram;
- o location of response kits and firefighting equipment;
- location of valves or drainage system control that could be used in the event of a discharge to contain materials on the site; and
- o compass direction.
- A complete inventory of all hazardous materials that will be used or stored on site, including reportable quantities in compliance with state and federal law (**Attachment C**);
- Contractor's training program for fuel truck drivers and mechanics (See Attachment D and Section 3,1 Training section below for details);
- Designation of the Contractor's Spill Response Coordinator (to be included in Attachment E Emergency Response Contacts);
- Emergency response procedures (Attachment F), as described in the Construction Mitigation and Reclamation Plan. In addition, the Contractor will include a prediction of the direction, rate of flow, and total quantity of oil/fuel which has the reasonable potential to be discharged, based on experience. A form has been provided in Attachment F;
- Contractor's Commitment to providing the necessary emergency response support for the Project (Attachment G);
- Certification by a registered Professional Engineer (Attachment H);
- A complete discussion of applicable state-specific requirements regarding oil product and hazardous materials handling that are stricter than the federal requirements (to be included in **Attachment I** State Requirements), if any. If none, then the Contractor will clearly state that in the discussion;
- Material Safety Data Sheets (MSDS) as supplied by the Contractor (Attachment J); and
- Any mutual aid agreements between the Contractor and other emergency response personnel.

The Contractor is encouraged to use the Environmental Protection Agency's (EPA) guidance document for preparing facility diagrams provided at the following website: www.epa.gov/oilspill/pdfs/guidance/6 FacilityDiagrams.pdf.

Amendments to the Contractor-Supplied SPCC Plan will be made as necessary during construction to account for increases in the volumes of materials stored or other changes associated with the handling or storage of hazardous materials.

3 Prevention

Keystone's goal is to prevent spills or exposure to hazardous or dangerous substances during construction of the Project. The Contractor is required to follow the prevention measures outlined below and implement other measures as necessary and required to promote spill prevention.

3.1 Training

Personnel accountable for carrying out the procedures specified in this plan will be designated before construction and informed of their specific duties and responsibilities with respect to environmental compliance and hazardous materials. The Contractor will be required to provide

additional spill prevention, response and hazardous materials handling training to all of their staff who handle hazardous materials, fuels and lubricants on a regular basis. The Contractor will provide the details of this training to Keystone prior to the start of work (**Attachment D**). At a minimum, training will include:

- A review of this SPCC Plan;
- An overview of all regulatory requirements;
- Waste minimization practices;
- Proper storage and handling methods for hazardous materials, fuels, lubricants, gases, etc.;
- Spill prevention, clean-up, and reporting requirements;
- Proper disposal techniques for hazardous materials, fuels, lubricants, etc.;
- Proper procedures for transferring fuels and containing fluids while doing maintenance on vehicles;
- Special requirements for refueling within 100 feet of wetlands and waterbodies;
- The location of the MSDSs and the SPCC Plan;
- The proper use of personal protective equipment;
- Emergency and spill response material locations, proper use, and maintenance;
- Emergency contact information and notification procedures; and
- Procedures for documenting spills and standard spill information to be provided to Keystone for agency notification.

All personnel working on the Project, including all Contractor personnel, are required to attend a Project-sponsored training session prior to starting work. Keystone will conduct training to ensure all responsible Contractor employees know of and comply with all project-specific environmental and TransCanada environmental policy requirements. The environmental training program will address refueling restrictions, hazardous materials handling, spill prevention and cleanup requirements, as well as other Project environmental and safety topics.

3.2 Site Security

The Contractor's site-specific plan and documentation for the construction yard will address site security procedures. Bulk fuel storage areas (including valves and switches), fuel trucks, lubricants and hazardous materials will be secured to minimize tampering and accidental releases by unauthorized personnel. Site security will include the following, in compliance with 40 CFR 112.7(g):

- The oil/fuel storage site will be fully fenced with a locked or guarded entrance gate when facility is unattended;
- Container master flow and drain valves will be secured so that they will remain in the closed position when not in use;
- Fuel pump starter controls will be locked in the "off" position where only authorized personnel can access them when not in use; and
- Facility lighting at night that will assist leak detection and vandalism prevention.

If the above procedures will not be followed, the Contractor will provide a detailed explanation of why the site cannot be secured as described above and the equivalent method the Contractor will use to secure the site.

All storage containers will be closed when not in use and the storage areas will be secured (gated, locked and/or guarded) at night and/or during non-construction periods.

3.3 Equipment Inspection and Maintenance

The Contractor will ensure that all equipment is free of leaks prior to use on the Project, and prior to entering or working in or near waterbodies or wetlands. Throughout construction, the

Contractor will conduct regular maintenance and inspections of the equipment to reduce the potential for spills or leaks.

Contractor mechanics will assess the general condition of equipment valves, lines and hoses and all deteriorated parts will be promptly repaired or replaced. Vehicles and equipment that develop leaks during construction activities will cease work, move to a location at least 100 feet from streams or wetlands, and buckets or absorbent materials will be placed under the equipment until the leak can be repaired. Soils contaminated by the leaking material will be collected and removed from the right-of-way for proper disposal. Equipment that requires extensive repairs will be removed from the right-of-way until the repairs are completed or a protection plan will be developed by the Keystone Environmental Inspector if the equipment can not be moved.

All equipment maintenance and repairs will be performed in upland locations at least 100 feet from waterbodies and wetlands. Mechanics will take precautionary measures when performing equipment maintenance or repair activities by placing absorbent pads (or equivalent materials) on the ground beneath the equipment when changing crankcase oil, repairing hydraulic lines, or adding coolant to construction equipment and when appropriate for other repair activities.

All equipment parked overnight shall be at least 100 feet from a watercourse or wetland, if possible. Equipment shall not be washed in streams or wetlands.

3.4 Materials Storage and Handling

The Contractor shall ensure that all oil products, fuels, gases, hazardous and potentially hazardous materials are transported, stored and handled in accordance with all applicable legislation.

Staging areas (including contractor yards and pipe yards) will be set up for each construction spread. Contractors conducting work in each of these areas will establish bulk fuel storage tanks within the staging area, or they will fill their fuel trucks at existing bulk fuel dealerships. In addition, a variety of lubricants and materials will be stockpiled at the staging area for use during construction of the Project. Bulk fuel storage tanks, fuel trucks and stockpiles of lubricants or hazardous materials will be stored only in the designated staging areas and equipment storage yards, and at least 100 feet from all streams and wetlands. No hazardous materials will be stored in areas subject to flooding or inundation.

Spent oils, lubricants, filters, etc. shall be collected and disposed of or recycled at an approved location in accordance with state and federal regulations.

Keystone contractors will not keep on site or operate the following:

- Completely or partially buried storage tanks
- Buried piping
- Internal steam heat coils
- Large, field-erected storage tanks

The following sections detail Project requirements associated with storage of bulk fuels and lubricants, as well as temporary storage of hazardous materials at staging areas.

3.4.1 Tanks

Keystone contractors will maintain commonly used fuels such as gasoline and diesel in bulk storage tanks in the pipeline contractor yards. All storage tanks or trailers, rigid steel piping, valves and fittings and fuel transfer or dispensing pumps will be contained within a secondary containment structure providing 110 percent containment volume of the largest storage tank or trailer within the containment structure. This containment structure will consist of sandbag or earth berms lined with a chemical resistant membrane liner or a concrete structure. The Contractor will remove any collected precipitation from the containment structure to maintain 110 percent capacity. The Contractor will inspect accumulated precipitation first for evidence of oil or contamination and then collect the material for proper disposal off-site.

The attached drawings are typical layouts for diesel and gasoline fuel transfer stations. Selfsupporting tanks will be constructed of carbon steel or other materials compatible with contents of each tank, and all tanks will be elevated above grade and inspected weekly and when the tank is refilled. To prevent overfill, all tanks will have visual level gauges and actual tank levels will be checked against the gauge reading during inspections. Inspection records shall be maintained by the Contractor.

For receiving and offloading fuels from a fuel distributor into the bulk storage tanks, the distributor will connect a petroleum rated hose from the delivery tanker to the fuel transfer stations fill line at the fill truck connection. The fill truck connection and fill line will consist of a cam-loc connection followed by a block valve, rigid steel piping, tank block valve(s) and check valve(s) just upstream of the connection to the tank. Off-loading of fuel is normally accomplished by a transfer pump powered by the delivery vehicle's power take off. Proper grounding of equipment shall be undertaken during fuel transfer operations. Fuel trucks from fuel distributors will be inspected closely prior to leaving the contractor yard to ensure that all valves are tightly closed and no leaks occur during transit.

For transfer of fuels from the bulk storage tanks in the contractor yards to fuel distribution trucks, the truck will connect a petroleum rated hose between the truck's tank and the bulk storage tank's withdrawal connection. The withdrawal truck connection and withdrawal line will consist of rigid steel piping from the tank, through a block valve(s) to an electric explosion-proof fuel transfer pump. Downstream of the fuel transfer pump will be a cam-loc connection. The fuel transfer pump will be equipped with an emergency shut-off at the pump and a secondary emergency shut-off at least 100 feet away. Proper grounding of equipment shall be undertaken during fuel transfer operations. Fuel truck drivers will inspect the truck after each re-filling from the bulk fuel tanks in the contractor yard to ensure that all valves are tightly closed and no leaks occur during transport.

For dispensing gasoline and on-road diesel to equipment or vehicles, the transfer pump will be a dispensing pump with petroleum rated hoses with automatic shut-off nozzles. Refueling operations will be attended closely at all times by personnel familiar with the operation of the refueling equipment. Warning signs requiring drivers to set brakes and chock wheels shall be displayed at all fixed refueling points. Proper grounding of equipment shall be undertaken during fuel transfer operations.

3.4.2 Containers

All containers 55 gallons or greater shall be stored on pallets within a secondary temporary containment structure. Secondary containment structures may consist of temporary earthen berms with a chemical resistant liner or a portable containment system constructed of steel, PVC, or other suitable material. The secondary containment structure will be capable of containing 110 percent of the volume of material stored in these areas. The Contractor will inspect all container storage areas for leaks and deterioration at least weekly, and leaking or deteriorated containers will be replaced as soon as the condition is first detected. In the event of a leak or deterioration of the container or liner, cleanup measures would be implemented to remediate all contamination.

No incompatible materials will be stored in the same containment area and the containers must be suitable and compatible with the wastes or materials in them. If a container leaks or sustains damage, its contents must be transferred to a container in good condition. Waste and hazardous materials will be kept in separate containers for proper disposal.

Containers holding hazardous substances will be closed during transport and storage, except as necessary to add or remove the substance.

3.4.2.1 Container Labeling Requirements

The Contractor will comply with labeling requirements for any on-site containers, including tanks that store fuels, lubricants, accumulated hazardous wastes and other materials. Hazardous waste containers will be labeled, as required in Title 40 CFR Part 262, and will display at least the following:

- Chemical name (e.g., oil, diesel, etc.);
- When the container reaches 55 gallons in volume, the accumulation start date and/or the start date of the 90-day storage period; and
- The words "Hazardous Waste" and warning words specifying the relevant hazards, such as "flammable", "corrosive", or "reactive".

3.4.3 Concrete Coating

Concrete coating and any washout necessary will be conducted at least 100 feet from wetlands or waterbodies boundaries whenever possible. In some circumstances, it may not be possible to maintain this buffer due to topography or the extent of the resource. If it is necessary to apply concrete coating less than 100 feet from a wetland or waterbody boundary, then sufficient containment (such as plastic sheeting and berms, etc.) will be provided by the Contractor to prevent any uncured concrete or concrete washout from reaching the ground. Excess concrete shall not be disposed of in wetlands or waterbodies. Concrete washout shall be contained within the work area and will not be allowed to enter wetlands, waterbodies, or storm drains.

3.4.4 Disposal of Solid and Hazardous Wastes

The Contractor will be responsible for ensuring that the regular collection and disposal of all solid and hazardous wastes generated during its operations is in compliance with all applicable laws. If state laws pertaining to waste disposal are more stringent than federal laws, state laws will take precedence. The Contractor will determine the details on the proper handling and disposal of hazardous waste, and will assign responsibility to specific individuals before construction.

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

Hazardous wastes will typically include contaminated soils, spent batteries, and other items. The Contractor will make every effort to minimize hazardous waste production during the Project, including, but not limited to:

- Minimizing the amount of hazardous materials needed for the Project;
- Using alternative non-hazardous substances when available; and
- Recycling usable materials, such as batteries, to the extent possible.

3.4.5 Equipment Refueling and Servicing

All equipment refueling will be performed in upland areas at least 100 feet from all wetlands and waterbodies, and at least 150 feet from private and public water wells, respectively. If site-specific constraints require refueling/servicing the equipment closer than 100 feet from the wetland or waterbody, special precautions may be implemented with the Environmental Inspector's approval – as described below.

At all refueling locations along the right-of-way, the Contractor will ensure that absorbent materials are on hand at all times. Each refueling vehicle shall have a sufficient number of

shovels, brooms, 10-mil polyethylene sheeting, and fire protection equipment to contain a moderate spill.

During refueling, the Contractor will take appropriate measures to reduce the risk of a spill, including not overfilling fuel tanks and placing an absorbent pad under the fuel nozzle while fueling equipment. Contractor personnel will observe and control refueling at all times to prevent overfilling. Drivers of tank trucks are responsible for safety and spill prevention. Procedures for loading and unloading tank trucks shall meet the minimum requirements established by the Department of Transportation.

3.4.6 Spill Response Equipment

The Contractor will be required to have emergency response equipment available at all areas where hazardous materials are handled or stored. This equipment shall be readily available to respond to a hazardous material emergency. The Contractor is required to have the appropriate spill response materials on site to address spills of materials stored or handled at the location. Such equipment shall include, but not be limited to, the following:

- First aid kits and supplies, sized to meet the needs of the numbers of personnel anticipated;
- Telephone or communications radio;
- Personal protective equipment (Tyvek® or equivalent suits, gloves, goggles, hard hat, and other personal protective equipment appropriate to the materials to be handled);
- Fire extinguishers;
- Absorbent materials;
- Storage containers;
- Non-sparking bung wrench; and
- Shovels.

Hazardous material emergency containment and clean-up materials and equipment shall be carried in all fuel trucks, mechanic and supervisor (foremen) vehicles. This equipment shall include, at a minimum:

- 2 shovels;
- First aid kit and supplies;
- Telephone or communications radio;
- Phone numbers for emergency contacts;
- 2 sets of protective clothing (Tyvek® or equivalent suit, gloves, goggles, boots);
- 6 heavy duty plastic garbage bags (30 gallon);
- 5 absorbent socks;
- 10 spill pads;
- 20 lb. fire extinguisher;
- Barrier tape;
- 2 orange reflector cones; and
- 200 square feet 10-mil plastic sheeting.

Fuel and service trucks shall also carry a minimum of 20 pounds of suitable commercial sorbent material and a catch-pan for fluids.

Each construction crew, including clean-up crews shall have on hand sufficient tools and materials to stop leaks and supplies of absorbent and barrier materials to allow rapid containment and recovery of spilled materials.

The Contractor shall inspect emergency equipment weekly, and service and maintain equipment regularly, replenishing supplies as necessary. Records shall be kept of all inspections and service.

3.4.7 Activities in Environmentally Sensitive Areas

The Contractor will obtain approval from the Keystone Environmental Inspector prior to refueling or performing equipment repair (involving lubricants, fuels, oil products, or hazardous materials) within 100 feet of a wetland or waterbody boundary. The Contractor shall monitor the refueling and equipment operation at all times. The Contractor will take precautions to prevent spillage by not overfilling fuel tanks, placing an absorbent pad under the fuel nozzle while fueling, and wiping the nozzle when fueling is complete.

Stationary equipment will be placed within a secondary containment if it will be operated or require refueling within 100 feet of a wetland or waterbody boundary.

In order to respond quickly to a potential spill in a major waterbody, the Contractor shall have on hand during all river crossings at least 400 feet of sorbent boom/sock and provide in **Attachment F** a method for deployment and collection.

4 Spill Control and Countermeasures

It is Keystone's goal to promptly stop spills, however the safety and health of Project personnel and the public is the foremost priority. Personnel should only respond to a spill if they have adequate training to do so safely.

All spills and leaks of hazardous materials and petroleum products will be cleaned up. Upon discovery of a spill, the Contractor will immediately:

- 1. Assess the area for safety: identify the material spilled, the cause, and any potential hazards. If it is an emergency threatening human health, dial 911. If telephone service is not available or 911 does not work in the area, immediately contact the spread office so emergency responders can be notified. Implement appropriate safety procedures, based on the nature of the hazard.
- 2. Extinguish or remove ignition sources, if the spilled material is flammable.
- 3. Shut off leaking equipment, if safe to do so.
- 4. Stop leaks, if possible.
- 5. Contain the spill using spill response materials and by creating a berm or dike, if necessary. Block culverts, storm sewers, and other points, if necessary to limit spill travel.
- 6. Notify supervisor of the spill, including material, quantity, time, and location. Supervisors are responsible for notifying Keystone of spills (see section below).

Personnel entry and travel on contaminated soils shall be minimized. The Contractor will commence spill clean-up immediately, if it is safe to do so. The Contractor is responsible for removing and disposing of contaminated material in accordance with applicable federal, state, and local laws. It is anticipated that most spills will be small and easily removed with a shovel, with contaminated soil deposited in plastic bags or similar containers for transport to the Contractor's yard. Larger spills may require the use of equipment or special services.

All efforts will be made to prevent a release to water resources; however, if the spilled material reaches water, sorbent booms, socks, and/or pads will be deployed to contain and remove the spilled material.

5 Documentation and Reporting

The Contractor shall notify Keystone immediately of any spill of a potentially hazardous substance that meets government reporting criteria as well as any existing soil contamination

discovered during construction. If pre-existing contamination is suspected, the Contractor shall stop work in the area and not resume work until authorized to do so by Keystone.

In the event of a spill that meets government reporting criteria, the Contractor shall notify the Keystone representative immediately, who, in turn, shall notify the appropriate regulatory agencies. Any material released into water that creates a sheen must be reported immediately to Keystone. The Contractor is required to notify Keystone immediately if there is any spill of oil, oil products, or hazardous materials that reaches a wetland or waterbody. Incidents on public highways shall be reported to Keystone and the appropriate agencies. A sample spill report form is provided in **Attachment L**.

The Contractor is responsible for documenting spills as required by federal, state, and local regulations.

As described on the EPA's website, facilities that spill more than 1,000 gallons of oil into navigable waters or onto adjoining shorelines in a single incident, or have two reportable oil spills of more than 42 gallons within any 12-month period, must submit a report to the appropriate EPA Regional Administrator within 60 days from the time the spill occurs. More details can be found at the EPA website. EPA will review the report and may require the facility owner or operator to amend the SPCC Plan if it does not meet the regulations or if an amendment is necessary to prevent and contain oil spills from the facility.

6 Inspection and Record Keeping

The Contractor will regularly inspect all storage facilities (not less than weekly) and record the condition of the facility in a weekly log. In addition to inspection items discussed in previous sections, inspections will include the outside of all containers for signs of deterioration, discharges, or accumulation of oil inside containment structures or dikes. Inspections will also include all aboveground valves, piping appurtenances and the general condition of items such as flange joints, expansion joints, valve glands and bodies, pipe supports, and metal surfaces.

In addition to the weekly log, the Contractor will maintain records for hazardous materials and hazardous wastes, as required by all applicable federal, state, and local regulations and permit conditions. Record-keeping requirements include, at a minimum:

- Hazardous materials/Waste inspection log,
- Transportation documents,
- Bills of lading,
- Manifests,
- Shipping papers,
- Training records,
- Release report forms, and
- Spill history and documentation of clean-up/handling.

The Environmental Inspector will monitor, inspect, document and report on the Contractor's compliance with hazardous materials and hazardous waste management practices. Inspection records will be kept with the SPCC Plan for at least three years.

7 Applicable State Requirements

The Contractor is required to include in submittals to Keystone a complete discussion of applicable state-specific requirements regarding oil product and hazardous materials handling that are stricter than the federal requirements, if any, to be included in **Attachment I**. If none, then the Contractor will clearly state that in the discussion.
8 Certification of Non-Substantial Harm

Keystone does not anticipate that this Project will satisfy the "substantial harm" criteria set forth in 40 CFR 112.20(e). The EPA requires that facilities that do not meet the criteria maintain a certification form to that affect with the SPCC Plan. This certification form is included in **Attachment M**.

Attachment A

SPCC Cross Reference Table

SPCC Rule	Description of Section	Page/Section	
§ 112.7	General requirements for SPCC Plans for all facilities and all oil types.	1/1	
§ 112.7(a)(1)	General requirements; discussion of facility's	1/1; throughout SPCC	
8 112 7(a)(2)	Deviations from Plan requirements	2/3 2: 4 & 5/ 3 4 1	
§ 112.7(a)(3)	Facility characteristics that must be described in the Plan and the Facility Diagram.	1 & 2/2	
§ 112.7(a)(3)(i)	Types of oil and container storage capacity.	Attachment C	
§ 112.7(a)(3)(ii)	Discharge prevention measures.	2 through 8/3	
§ 112.7(a)(3)(iii)	Discharge or drainage controls.	3 through 7/3.2; 3.3; 3.4	
§ 112.7(a)(3)(iv)	Countermeasures for discharge, discovery, response, and cleanup	8/4	
§ 112.7(a)(3)(v)	Methods of disposal of recovered or waste materials	4 through 6/3.3; 3.4; 3.4.3; 3.4.4	
§ 112.7(a)(3)(vi)	Contact list and phone numbers.	Attachment E	
§ 112.7(a)(4)	Spill reporting information in the Plan.	8/5; Attachment I	
§ 112.7(a)(5)	Emergency procedures.	2/2; 9/4; Attachment F	
<u>§ 112.7(b)</u>	Fault analysis. Equipment failure information.	2/2; Attachment F	
§ 112.7(c)	Secondary containment.	4/3.4.1; 5/3.4.2; 7/3.4.7	
§ 112.7(d)	integrity testing.	4/3.4.1; 5/3.4.2; 8/4; Attachment F	
§ 112.7(e)	Inspections, tests, and records.	4/3.4.1; 5/3.4.2; 9/6	
§ 112.7(f)	Employee training and discharge prevention procedures.	2 & 3/3.1	
§ 112.7(g)(1)	Security (excluding oil production facilities).	3/3.2	
§ 112.7(g)(2)	Flow valves secured.	3/3.2	
§ 112.7(g)(3)	Oil pumps controls locked.	3/3.2	
§ 112.7(g)(4)	Secure loading/unloading connections on oil piping.	Not Applicable	
§ 112.7(g)(5)	Provide facility lighting.	3/3.2	
§ 112.7(h)(1)	Loading/unloading (excluding offshore facilities): provide containment system for loading and unloading area.	Not Applicable	
§ 112.7(h)(2)	Loading/unloading: systems to prevent vehicles from departing before complete disconnection.	5/3.4.1	
§ 112.7(h)(3)	Loading/unloading: inspect vehicle to prevent liquid discharge while in transit.	4/3.4.1	
§ 112.7(i)	Brittle fracture evaluation requirements.	Not applicable	
§ 112.7(j)	Discuss conformance with more stringent State rule, regulations, and guidelines.	7/9	
§ 112.8 / § 112.12	Requirements for onshore facilities (excluding production facilities).	-	
§ 112.8(a) / § 112.12(a)	General and specific requirements	See above and below	
§ 112.8(b) / § 112.12(b)	Facility drainage.	4/3.4.1	
§ 112.8(c) / § 112.12(c)	Bulk storage containers.	4/3.4.1; 5/3.4.2	
§ 112.8(d) / § 112.12(d)	Facility transfer operations, pumping, and facility process.	4/3.4.1; 5/3.4.2	
§ 112.9 / § 112.13	Requirements for onshore production facilities	Not applicable	

SPCC Rule	Description of Section	Page/Section
§ 112.9(a) / § 112.13(a)	General and specific requirements	Not applicable
§ 112.9(c) / § 112.13(c)	Oil production facility bulk storage containers.	Not applicable
§ 112.9(d) / § 112.13(d)	Facility transfer operations, oil production facility.	Not applicable
§ 112.10 / § 112.14	Requirements for onshore oil drilling and workover facilities.	Not applicable
§ 112.10(a) / § 112.14(a)	General and specific requirements.	Not applicable
§ 112.10(b) / § 112.14(b)	Mobile facilities.	Not applicable
§ 112.10(c) / § 112.14(c)	Secondary containment - catchment basins or diversion structures.	Not applicable
§ 112.10(d) / § 112.14(d)	Blowout prevention.	Not applicable
§ 112.11 / § 112.15	Requirements for offshore oil drilling, production, or workover facilities.	Not applicable
§ 112.11(a) / § 112.15(a)	General and specific requirements.	Not applicable
§ 112.11(b) / § 112.15(b)	Facility drainage.	Not applicable
§ 112.11(c) / § 112.15(c)	Sump systems.	Not applicable
§ 112.11(d) / § 112.15(d)	Discharge prevention systems for separators and treaters.	Not applicable
§ 112.11(e) / § 112.15(e)	Atmospheric storage or surge containers; alarms.	Not applicable
§ 112.11(f) / § 112.15(f)	Pressure containers; alarm systems.	Not applicable
§ 112.11(g) / § 112.15(g)	Corrosion protection.	Not applicable
§ 112.11(h) / § 112.15(h)	Pollution prevention system procedures.	Not applicable
§ 112.11(i) / § 112.15(i)	Pollution prevention systems; testing and inspection.	Not applicable
§ 112.11(j) / § 112.15(j)	Surface and subsurface well shut-in valves and devices.	Not applicable

Attachment B

Contractor Yard or Fueling Station Facility Diagram

Attachment C

Hazardous Materials Inventory and Reportable Quantities

Attachment D

Contractor's Training Program

Attachment E

Emergency Response Contacts

Emergency Response Contacts

DIAL 911 IN CASE OF EMERGENCY

The Contractor is to fill out the applicable information required below. Contractor will attach additional sheets as necessary.

Contractor:		Spread/Sta	tion:	
Contractor Spill Response Coord	dinator:	NAME		TELEPHONE NUMBER
Keystone Representative:	NAME			TELEPHONE NUMBER
Sheriffs' Telephone Numbers, County	by County Telephone Number	Ca	ounty	Telephone Number
Highway Patrol:				
U.S. Poison Control Center: 800	-222-1222			
Hospitals Near Work Areas Name	Address	T	elephone lumber	County
Spill Response and Cleanup Con	ntractor:	NAME		TELEPHONE NUMBER
Spill Response and Cleanup Con	ntractor:	NAME		TELEPHONE NUMBER
Spill Response and Cleanup Con	ntractor:	NAME		TELEPHONE NUMBER

Keystone is the designated contact for all agency notifications.

Agency Telephone Number Home Page Website		Online Spill Report Form Webpage			
Federal					
National Response Center	800-424-8802	http://www.nrc.uscg.mi l/nrchp.html	http://www.nrc.uscg. mil/report.html		
Montana					
Montana Department of Environmental Quality	800-424-8802	http://www.deq.mt.gov/ enf/spillpol.asp	http://www.deq.mt.go v/enf/spill.asp		
South Dakota					
South Dakota Department of Environment & Natural Resources	605-773-3296 and 605-773-3231 after hours	http://www.state.sd.us/ denr/DES/ground/Spill s/SpillReporting.htm	http://www.state.sd.u s/denr/DES/ground/S pills/SpillsFollowUp.a sp		
Nebraska					
Department of Environmental Quality	402-471-2186 or 877-253-2603 and Nebraska State Patrol at 402-471-4545 after hours	http://www.deq.state.n e.us/	Not applicable		
Kansas					
Kansas Emergency Management	800-275-0297 or 785-296-8013	http://www.kansas.gov /kdem/hazards/hmenr g.shtml	http://www.kansas.g ov/kdem/pdf/hazards /082102_formA.pdf		
Oklahoma					
Oklahoma Corporation Commission	918-367-3396 and 405-521-2240 after hours	http://www.occ.state.o k.us/Divisions/OG/spill (c).htm	Not applicable		
Texas					
Texas Commission on Environmental Quality (TCEQ)	800-832-8224	http://www.tceq.state.t x.us/response/spills.ht ml	Not applicable		

Attachment F

Contractor's Emergency Response Procedures

ediction ¹	
ource Pre	
ial Spill S	
nd Potent	
Failure ar	
uipment	
Щ	

			Containment				
			Direction of Flow				
, , ,	Rate of	Flow	(gpm) ²				
•	Total	Quantity	(gallons)				
		Type of	Failure				
	_	_	Source				

¹ Title 40 CFR 112 states: "where experience indicates a reasonable potential for equipment failure (such as loading or unloading equipment, tank overflow, rupture, or leakage, or any other equipment known to be a source of a discharge), include in your Plan a prediction of the direction, rate of flow, and total quantity of oil which could be discharged from the facility as a result of each type of major equipment failure." ² GPM = gallons per minute

Attachment G

Contractor's Commitments

Contractor's Commitments

I hereby certify that I am at a level with the authority to, and do hereb to implement this SPCC Plan (40 therein.	I of management within, by commit the necessary manpower, equipment, and materials CFR Part 112) in accordance with the provisions set forth
Name:	
Name:	(Signature)
Title/Company:	
Date:	

Attachment H

Professional Engineer's Certification

Registered Professional Engineer Certification

By means of this certification, I attest that:

- I have reviewed this Spill Prevention, Control and Countermeasure Plan (SPCC);
- I am familiar with the requirements of Title 40 Code of Federal Regulations (CFR) Part 112;
- I or my agent has visited and examined the facility;
- This SPCC Plan has been prepared in accordance with good engineering practice, including consideration of applicable industry standards, and with the requirements of Title 40 CFR Part 112;
- Procedures for required inspections and testing have been established; and
- This SPCC Plan is adequate for the facility.

Signature of Registered Professional Engineer

Name (Printed)

Date

Attachment I

State Requirements

Attachment J

Contractor's Material Safety Data Sheets (MSDS)

Attachment K

Typical Layouts; Fuel Transfer Stations

Attachment L

Spill Report Form

SPILL REPORT FORM

LOCATION AND DATE DETAILS	Facilit	y Telephone Number:
Form Completed by:		Date:
Date of spill:		Time of spill:
Date of spill discovery:		Time of spill recovery:
Location:		County:
Short legal description: TR	S	Weather Conditions:
Directions from nearest community:		
Name and Title of Discoverer:		
	NAME	TITLE
SPILL AND MATERIAL DETAILS		
Type of material spilled and product nam	ne:	
Manufacturer's name:		
Estimated volume spilled:		Estimated volume recovered:
Topography and surface condition of spi	Il site:	
Spill medium: Devement Development Development	Vater 🛛 Other:	(Check all that
apply)		
Responsible party (Name, Phone Numb	er):	
	NAME	TELEPHONE NUMBER
Describe the causes and circumstances	resulting in the s	spill:

WATER RESOURCES AFFECTED

ſ

🗆 No	If "Yes", was a sheen present?	Yes				
	Feet					
Estimated quantity of material that entered surface waters or wetland:						
Direction and time of travel (if in stream):						
	□ No	No If "Yes", was a sheen present?Feet ace waters or wetland:				
SPILL REPORT FORM CONTINUED

DESCRIPTION OF SPILL/ HARMFUL EFFECTS

Describe extent of observed contamination, both horizontal and vertical:

Resources and installations that may be affected:

Describe any injuries or potential impact on human health caused by the spill: _

COURSE OF ACTION

Describe immediate spill control and/or cleanup methods used and implementation schedu	ıle:
Evacuation necessary? Yes No Describe:	
Current status of cleanup actions:	
Future follow-up required, if any:	

NAME/COMPANY/TELEPHONE NUMBER FOR THE FOLLOWING

Contractor Superintendent:	1		
	NAME	COMPANY	TELEPHONE NUMBER
Contractor's Environmental Coo	ordinator:		
	NAME	COMPANY	TELEPHONE NUMBER
Lead Environmental Inspector:	_		
	NAME	COMPANY	TELEPHONE NUMBER
Other:			
	NAME	COMPANY	TELEPHONE NUMBER

Contractor must complete this form for any spill that meets state or federal reportable quantities, and for petroleum spills that enter waterbodies or wetlands, affect human health, or exceed 42 gallons, and submit the form to the Lead Environmental Inspector immediately.

Attachment M

Certification of the Applicability of the Substantial Harm Criteria

Certification of the Applicability of the Substantial Harm Criteria

Facility Name:Keystone Pipeline ProjectFacility Address:Various locations along the pipeline route in Montana, South Dakota, Nebraska, Kansas,Oklahoma, and Texas. Mailing address:

Keystone XL Pipeline Project 7509 Tiffany Springs Parkway Northpointe Circle II, Suite 200 Kansas City, Missouri 64153

1. Does the facility transfer oil over water to or from vessels and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes ____ No <u>X</u>

2. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank plus sufficient freeboard to allow for precipitation within any aboveground oil storage tank area?

Yes ____ No <u>X</u>

3. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C–III to this appendix or a comparable formula³) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments? For further description of fish and wildlife and sensitive environments, see Appendices I, II, and III to DOC/NOAA's "Guidance for Facility and Vessel Response Plans: Fish and Wildlife and Sensitive Environments" (see Appendix E to this part, section 13, for availability) and the applicable Area Contingency Plan.

Yes ____ No <u>X</u>

4. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and is the facility located at a distance (as calculated using the appropriate formula in Attachment C-III to this appendix or a comparable formula¹) such that a discharge from the facility would shut down a public drinking water intake⁴?

Yes ____ No _X

5. Does the facility have a total oil storage capacity greater than or equal to 1 million gallons and has the facility experienced a reportable oil discharge in an amount greater than or equal to 10,000 gallons within the last 5 years?

Yes <u>No X</u>

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate, and complete.

Signature

Name (please type or print)

Title

³ If a comparable formula is used, documentation of the reliability and analytical soundness of the comparable formula must be attached to this form.

⁴ For the purposes of 40 CFR part 112, public drinking water intakes are analogous to public water systems as described at 40 CFR 143.2(c).

TransCanada Keystone Pipeline, LP

Keystone XL Pipeline Project Response to United States Department of State Data Request 5.0 September 3, 2010 Page 66 of 74

United States Department of State 5.6.5

Reference: Keystone XL Project Environmental Report Oil Risk Assessment and Environmental Consequences Analysis

Request:

We understand that under current regulations, Keystone will not be required to submit an Emergency Response Plan (ERP) until 6 months prior to Project operation. However, DOS has determined that it is appropriate to include a draft ERP in the EIS to provide the public with basic information on the likely procedures that would be followed in the event of an accidental release from Project facilities. As a result, Keystone should provide a draft ERP that reasonably describes the key procedures, coordination activities, anticipated contacts, equipment to be used, possible cleanup activities, and other information needed to understand how Keystone would respond to an accidental release of crude oil during operation of the Project. This draft could be developed using previously approved EPR's, such as the ERP for the Keystone Pipeline Project.

Response:

Attached are responsive portions of the Keystone Pipeline Emergency Response Plan. This plan will be updated to include Keystone XL-specific emergency preparedness and emergency response information prior to Keystone XL project commencing operations.

Prepared By: Niki Affleck, TransCanada

SECTION 1

NOTIFICATION PROCEDURES

This Section is a guide for notification procedures that should be implemented immediately after discovering a discharge incident and, if possible, securing the source. Internal and external notifications are described separately for clarification purposes only. All notifications are of extreme importance and must be completed in a timely manner.

1.1 INTERNAL NOTIFICATION

The following internal notifications will be made for each emergency event (reference is provided in Figure 1.2). Internal notification protocols are developed and implemented to ensure effective communications between all internal parties and support provided by pre-determined on call corporate and business units. The notification protocol includes those responding to an emergency as well as notification to all senior management up to the Chief Executive Officer of the company.

Employee Discovering Discharge

- Immediately notify the Oil Control Center (contact information is listed in Figure 1.2).
- Notify the local fire department, police department, and rescue, as needed.

Oil Control Center

- Verify emergency.
- Immediately notify the Oil Control Center Manager.
- Notify Regional On-Call Manager.
- Notify Corporate Emergency Operations Manager.

Regional Manager On-Call

- Initiates the field response
 - Contacts employees to staff the Incident Command Post
 - Contacts employees to staff the Regional EOC

Regional EOC

- Completes local notifications
- Establishes an emergency communication line (conference line) for use between the Corporate and Regional EOC and the Incident Commander Post for information sharing and support

Corporate Emergency Operations Center Manager

- Contact Oil control Center and review emergency particulars
- Activate Corporate / Business support departments
 - Thirteen pre-determined departments on call 24/7 to provide tactical and strategic support
 - Departments implement their notification protocols advising their line management of the event
- Corporate Security is a Support Department

Corporate Security

- Determine if incident meets the criteria of a crisis
- If criteria met Notify the Chairman of the Crisis Management Team

Chairman of Crisis Management Team

• Notify members of the Crisis Management Team





FIGURE 1.2 INTERNAL NOTIFICATION REFERENCES

CORPORATE RESPONSE PERSONNEL / OTHER COMPANY CONTACTS INTERNAL NOTIFICATIONS

POSITION/TITLE	NAME	OFFICE	HOME	CELL	PAGER
	Keystone Oil Control Center	(403) 920-8080			

There are no Field Personnel currently working on this proposed Pipeline.

1.2 EXTERNAL NOTIFICATIONS

External notifications are those made to entities outside of the Company including Federal, Province/State and local regulatory agencies, railroad and utility companies and contractors. These notifications include both verbal and written requirements.

Employee Discovering the Discharge

• Notify local emergency services immediately.

Oil Control Center

• Notify the emergency response contractor if this has not been completed by the Regional Manager On-Call.

Regional Manager On-Call

• Notify the contracted Spill Management Team, the O'Brien's Group, and the Spill Response Contractor, National Response Corporation.

TransCanada Personnel

• Notify the U.S. National Response Center, the Cdn Transportation Safety Board, the National Response Corporation, Cdn National Energy Board, appropriate Federal agencies, County Emergency management, Province/State Environmental Agencies, and the Utilities One Call, as needed (notification requirements and contact information are listed in Figure 1.5).

Verbal Notification Requirements

Immediate internal notification is to be made in accordance with the Internal Notification Procedures found in Section 1.1 when a system operational failure or other type of incident occurs. This will allow immediate evaluation and classification of incidents and prompt immediate telephonic notification as detailed in Figure 1.4 and 1.5 to the Transportation Safety Board, National Response Center (NRC), Province/State agencies, local agencies, and other Federal agencies as required. The information found on the Notification Data Sheet, Figure 1.3, should be used to disseminate incident information to the appropriate agencies.

For the purpose of this procedure, immediate reporting means reporting the instant a person has knowledge of an actual or suspected leak, uncontrolled release of product, any unplanned spill or other pipeline system failure. Information that causes any employee to reasonably suspect a leak or uncontrolled release of product must be immediately reported, even when the actual existence or location of a leak or release cannot yet be confirmed.

Written Notification Requirements

In addition to the verbal notification requirements, written notifications are required in both Canada and the United States. In the United States, a written report is to be filed as soon as practical, but not later than 30 days after discovery of the incident to the Information Resources Manager, Office of Pipeline Safety, Pipeline and Hazardous Materials Safety Administration, US Department of Transportation. Information concerning the event shall be reported on Pipeline and Hazardous Materials Safety Administration Form 7000-1 on-line on the Pipeline and Hazardous Materials Safety Administration website via log-in. Paper reports are not required. This report is to be filed for all incidents reported telephonically and other incidents required to be reported in accordance with the criteria listed below.

The information required for completing the 30-day written report will be furnished by the Area Offices to the Department of Transportation Regulatory Compliance Department for submission to the Department of Transportation. Any subsequent or additional information that was not reported on the initial written report must be reported to the Department of Transportation Regulatory Compliance Department by the Area Office. This information will be utilized in filing a supplemental written report to the Department of Transportation as soon as possible, but no later than 30 days after its discovery.

In Canada, a detailed written incident report is required as soon as practicable to the Transportation Safety Board (TSB) and National Energy Board (NEB).

Transportation Safety Board of Canada Pipeline Occurrence Reporting		
Citation	Description	
Extracts from Transportation Safety Board Regulations Sections 5(1) and 5 (5)	When a reportable pipeline accident or incident takes place, the operator and any employee of the operator having direct knowledge of the accident or incident shall report to the Board as soon as possible and by the quickest means available. Where any person mentioned above makes a report, no other person referred to is required to make such a report.	
Transportation Safety Board Regulations Section 2(1)	A "reportable pipeline accident" is an accident resulting directly from the operation of a pipeline, where (a) a person sustains a serious injury or is killed as a result of being exposed to i. a fire, ignition or explosion, or ii. a commodity released from the pipeline, or (b) the pipeline i. sustains damage affecting the safe operation of the pipeline as a result of being contacted by another object or as a result of a disturbance of its supporting environment, ii. causes or sustains an explosion, or a fire or ignition that is not associated with normal operating circumstances, or iii. sustains damage resulting in the release of any commodity.	
Transportation Safety Board Regulations Section 2(1)	 A "reportable pipeline incident" means an incident resulting directly from the operation of a pipeline where (a) an uncontained and uncontrolled release of a commodity occurs, (b) the pipeline is operated beyond design limits, (c) the pipeline causes an obstruction to a ship or to a surface vehicle owing to a disturbance of its supporting environment, (d) any abnormality reduces the structural integrity of the pipeline below design limits, (e) any activity in the immediate vicinity of the pipeline poses a threat to the structural integrity of the pipeline, or (f) the pipeline, or a portion thereof, sustains a precautionary or emergency shut-down for reasons that relate to or create a hazard to the safe transportation of a commodity 	

NOTE: Refer to Figure 1.5 for any additional Province/State written reporting requirements.

FIGURE 1.3

NOTIFICATION DATA SHEET				
Date: Time:				
	INCIDE	NT DESCRIPTION		
Reporter's Full Name		Position:		
Day Phone Number:		Evening Phone I	Number:	
Company:		Organization Tv	De:	
Facility Address:		Owner's Address	5;	
			5.	
Facility Latitude:		Facility Longitud	de:	
Spill Location:				
(if not at Facility)				
Responsible Party's Name:		Phone N	lumber:	
Responsible Party's Address:				
Source and/or cause of discharge.				
	4			
Nearest City:				
County:	State:		Zip Code:	
Section:	Township:		Range:	
Distance from City:		Direction from C	ity:	
Container Type:		Container Storag	ge Capacity:	
Facility Oil Storage Capacity:			5.	
Material:				
Total Quantity Released	Water Impac	t (YES or NO)	Quantity	into Water
	RESPO	ONSE ACTION(S)		
Action(s) taken to Correct. Contro	l. or Mitigate Incider	nt:		
	., g		3 <u>-</u>	
Number of Injuries:		Number of Deaths	5:	
Evacuation(s):		Number Evacuate	ed:	
Damage Estimate:		_		
More information about impacted	medium:	24		
presidenti la nombra deservividencia, descendenzalmentari videra - consectanzalmentari				
Possible hazards to human health	or the environment	outside of the Facil	ity:	
			151 T	
2				
CALLER NOTIFICATIONS				
National Response Center (NRC):	1-800-424-8802 Trai	sportation Safety B	loard:	819-997-7887
Additional Notifications (Circle al	l annlicable): IISC	G NEP EP	A Province	State Other
Additional Nouncations (Circle an applicable): USCG NEP EPA Province State Other			State Villel	
Incident Assigned No				
meldent Assigned No.				
Any information about the incident not recorded elsewhere in this report including estimated				
	reu material:			
NOTE: DO NOT DEL AY NOTIFICAT				
NOTE. DO NOT DELAT NOTIFICAT	ON PENDING COLL	LOTION OF ALL INF	UNINA TION.	



FIGURE 1.4 EXTERNAL NOTIFICATION FLOWCHART

FIGURE 1.5 EXTERNAL NOTIFICATION REFERENCES

U.S. Federal Notification Requirements

National Response Center (NRC) c/o United States Coast Guard (CG-3RPF-2), 2100 2nd Street Southwest - Room 2111-B Washington, District Of Columbia 20593- 0001	(800) 424-8802 (202) 267-2180 (800) 337- 7455	
REPORTING REQUIREMENTS TYPE: Any discharge or sighting of oil on navigable waters. VERBAL: Immediate notification required (within 2 hours). WRITTEN: If an RQ limit is reached, refer to state requirements for written report requirements. NOTE: A call to the NRC must also be made for spills or releases of hazardous substances that meet or exceed their RQ >5 Gal.		
Office of Pipeline Safety and Hazardous Materials U.S. Department of Transportation 1200 New Jersey Avenue SE-E-22-321 Washington, District Of Columbia 20590	(202) 366-4000	
REPORTING REQUIREMENTS TYPE: In addition to the reporting of accidents to the NRC PHMSA Form 7000-1. VERBAL: Call to the NRC meets the required verbal notified	as noted below, a written accident report cation under DOT reporting requirement.	

VERBAL: Call to the NRC meets the required verbal notification under DOT reporting requirement. WRITTEN: Reported on PHMSA Form 7000-1 no later than 30 days, submit a report resulting from explosion/ fire/hospitalization, death, property damage greater than \$50,000, or above reportable quantity.

NOTE:

U.S. Environmental Protection Agency, Region 8	(303) 312-6312
999 18th Street Suite 500	
Denver, Colorado 80202-246	
REPORTING REQUIREMENTS	
TYPE: Immediately for spills that impact or threaten navigable	e water or adjoining shoreline.
VERBAL: Notification to the EPA is typically accomplished by	the call to the NRC.
WRITTEN: In accordance with the applicable SPCC regulation	ns, within 60 days for a spill in excess of 1,000
gallons (24 bbls.) in a single event or two spill events within a	twelve month period into or upon nav. water
NOTE:	

Г

Г

U.S. Environmental Protection Agency, Region 5 77 W. Jackson Blvd., 5th Floor	(312) 353-2318 (312) 353-2000
REPORTING REQUIREMENTS TYPE: Any oil discharge that has impacted or threatens to impact navigable waters or release of hazardous substances in an amount equal or greater than the reportable quantity. VERBAL: Notification to the EPA is typically accomplished by the call to the NRC. WRITTEN: For oil discharge within 60 days, in accordance with applicable SPCC RQ. NOTE:	

U.S. Environmental Protection Agency, Region 6	(214) 665-6595
1445 Ross Avenue, Suite 1200	(214) 665-2222
Dallas, Texas 75202	(866) 372-7745
REPORTING REQUIREMENTS TYPE: Immediately for all spills that impact or threaten navig. VERBAL: Notification to the EPA is typically accomplished by WRITTEN: As the agency may request depending on circum NOTE:	able water or adjoining shoreline. / the call to the NRC. stances.

Canadian Federal Notification Requirements

Transportation Safety Board (TSB) of Canada	(819) 997-7887 (800) 387-3557
200 Promenade du Portage, Place du Centre, 4th Floor	
Gatineau, Quebec 1K8	
REPORTING REQUIREMENTS	
TYPE: All pipeline accidents with fatality or serious injury,	fire or explosion, oil spill, pipeline rupture or
any other pipeline failure or maifunction.	
WRITTEN: Within 20 days	
NOTE:	

Canadian National Energy Board (CA NEB)	(403) 807-9473
444 Seventh Avenue SW	(800) 899-1265
Calgary, Alberta 12P OX8	
REPORTING REQUIREMENTS	
TYPE: All spills or discharges.	
VERBAL: Immediately.	
WRITTEN: As requested by the Agency.	
NOTE:	

U.S. State Notification Requirements

South Dakota Department of Environment and Natural PMB 2020 Joe Foss Building, 523 East Capitol Pierre, South Dakota 57501-3182	(605) 773-3151
REPORTING REQUIREMENTS TYPE: All spills or discharges VERBAL: Immediately. WRITTEN: As requested by the Agency. NOTE:	

Game, Fish and Parks	(605) 345-3381
South Dakota	
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

South Dakota DENR, Div of Environmental Services	(605) 773-3296	
523 East Capitol Ave.	(605) 773-3231	
Pierre, South Dakota 57501-3182		
REPORTING REQUIREMENTS		
TYPE: Any Spill or discharge greater than reportable quantity.		
VERBAL: Immediately.		
WRITTEN: Within 30 days.		
NOTE:		

Г

South Dakota DENR, Division of Oil and Gas South Dakota	(605) 394-2229
REPORTING REQUIREMENTS TYPE: VERBAL: Courtesy Reporting WRITTEN: NOTE:	

South Dakota Department of Environment and Natural South Dakota	(605) 773-6035
REPORTING REQUIREMENTS TYPE: VERBAL: Courtesy Reporting WRITTEN: NOTE:	

South Dakota Department of Transportation, RR	(605) 773-3046 (605) 773-3921
REPORTING REQUIREMENTS TYPE: VERBAL: Courtesy Reporting WRITTEN: NOTE:	

South Dakota Department of Transportation, ROW	(605) 773-3710
South Dakota	(605) 773-4249
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

Г

П

Γ

Г

South Dakota Division of Emergency Management South Dakota	(605) 773-3231
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

South Dakota Public Utilities Commission	(605) 773-3201
South Dakota	
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

Department of Environmental Quality	(402) 471-2186	
1200 N Street Suite 400 / PO Box 98922	(402) 471-4545	
Lincoln, Nebraska 68509-8922		
REPORTING REQUIREMENTS		
TYPE: Any Discharge that leaves the Facility or threatens to impact navigable waters.		
VERBAL: Immediately, but not longer than 30 minutes.		
WRITTEN: As Requested by the Agency		
NOTE:		

Nebraska Emergency Management Agency Lincoln, Nebraska	(402) 471-7176
REPORTING REQUIREMENTS TYPE: VERBAL: Courtesy Reporting WRITTEN: NOTE:	<u>.</u>

Nebraska Game & Parks Commission	(402) 471-5423
Lincoln, Nebraska	(402) 271-5440
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

Department of Natural Resources Nebraska	(402) 494-2363
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

Oklahoma Department of Environmental Quality	(405) 702-1000
Oklahoma City, Oklahoma 73102	
REPORTING REQUIREMENTS TYPE: VERBAL: Courtesy Reporting WRITTEN: NOTE:	

TYPE: (16 TAC Section 3.20 (a)-(b)) In the case of a fire, spill or break causing loss of over (5) barrels.		
For Pipeline incidents reportable to the NRC, notify the TRRC Pipeline Safety Section's District		
ļ		

WRITTEN: File Form H-8 in duplicate when appropriate measure have been taken, within 30 days following the date of the incident.

NOTE:

Texas Commission on Environmental Quality	(512) 463-7727		
2800 S IH 35, Suite 100	(713) 767-3500		
Austin, Texas, 78704	(713) 767-3563		
REPORTING REQUIREMENTS			
TYPE: All spills of oil or petroleum products into water and/or discharges onto land that meet or exceed			
5 barrels			

VERBAL: As soon as possible, within 24 hours of discovery.

WRITTEN: As the agency may request, depending on circumstances.

NOTE:

Montana Department of Environmental Quality	(406) 444-1420 (406) 841-3911	
REPORTING REQUIREMENTS		
TYPE: Releases must be reported to the DEO within 24 hours of being detected as required by ARM		
17.30.301.		
VERBAL: Within 24 hours. Call the Leak Line at 1-800-457	7-0568. or after hours at (406) 841-3911.	

VERBAL: Within 24 hours. Call the Leak Line at 1-800-457-0568, or after hours at (406) 841-3911.. WRITTEN: NOTE:

State of Montana Department of Natural Resources	(406) 586-3136
REPORTING REQUIREMENTS	
TYPE:	
VERBAL: Courtesy Reporting	
WRITTEN:	
NOTE:	

Canadian Provincial Notification Requirements

Alberta Environment	(800) 222-6514	
9915 -108 Street 10th Floor, Petroleum Plaza South Tower		
Edmonton, Alberta 15K 2G8		
REPORTING REQUIREMENTS		
TYPE: All spills to water or exceeds a reportable quantity or emission level.		
VERBAL: Immediately.		
WRITTEN: Within 7 days.		
NOTE:		

Γ

Saskatchewan Environment and Resource Management	(800) 667-7525	
Box 3003, 800 Central Avenue.		
Prince Albert, Saskatchewan S5V 6G1		
REPORTING REQUIREMENTS		
TYPE: Any oil spill to water or oil spill greater than or equal to 50 L. to land.		
VERBAL: Immediately		

WRITTEN: Within 7 days. NOTE:

LOCAL EMERGENCY AGENCIES

Montana	
Phillips County LEPC	(406)-654-2350
Valley County LEPC	(406) 228-6224
McCone County LEPC	(406)-485-2347
Dawson County LEPC	(406)-377-2361
Prairie County LEPC	(406)-635-5738
Fallon County LEPC	(406) 778-3223
Carter County LEPC	(406)-975-6416
South Dakota	
Harding County LEPC	(605) 375-3414
Butte County LEPC	(605) 892-4205
Perkins County LEPC	(605) 244-5243
Meade County LEPC	(605) 347-4222
Pennington County LEPC	(605) 394-2185
Haakon County LEPC	No number listed
Jones County LEPC	(605) 669-2362
Lyman County LEPC	(605) 869-2200
Tripp County LEPC	(605) 842-2306
Nebraska	
Keya Paha County LEPC	(402)- 376-2420
Holt County LEPC	(402)-336-4126
Garfield County LEPC	No number listed
Wheeler County LEPC	No number listed
Greeley County LEPC	No number listed
Boone County LEPC	(402)-395-6525
Nance County LEPC	(308)-536-2452

Merrick County LEPC	(308)-946-2345
Hamilton County LEPC	(402)-694-5155
York County LEPC	(402)-363-2675
Fillmore County LEPC	(402)-759-4914
Saline County LEPC	(402)-821-3010
Jefferson County LEPC	(402)-656-3615

Oklahoma			
Lincoln County LEPC	(405)-258-1285		
Creek County LEPC	(918)-367-9489		
Okfuskee County LEPC	(918)-623-1122		
Seminole County LEPC	(405)-382-2499		
Hughes County LEPC	(405)-379-2203		
Coal County LEPC	(580)-927-2121		
Atoka County LEPC	(580)-889-2221		
Bryan County LEPC	(580)-924-3737		
Texas	•		
Fannin County LEPC	(903)-583-2143		
Lamar County LEPC	(903)-737-2400		
Delta County LEPC	(903)-395-2146		
Hopkins County LEPC	(903)-438-4040		
Franklin County LEPC	(903)-537-4539		
Wood County LEPC	(903)-763-5461		
Upshur County LEPC	(903)-843-2541		
Smith County LEPC	(903)-590-2653		
Cherokee County LEPC	(903)-683-5947		
Rusk County LEPC	(903)-657-3581		
Nacogdoches County LEPC	(409)-560-7793		
Angelina County LEPC	(936)-634-3331		
Polk County LEPC	(936)-327-6810		
Liberty County LEPC	(936)-336-4525		
Hardin County LEPC	(409)-246-5100		
Jefferson County LEPC	(409)-835-8411		
Orange County LEPC	(409)-883-2612		

ADDITIONAL RESPONSE RESOURCES		
Planning and Incident Support		
COMPANY	LOCATION	TELEPHONE
National Response Corporation	3500 Sunrise Hwy Ste. T103 Great River, New York 11739	(800) 899-4672
O'Brien's Response Management Inc.	Slidell, Louisiana	(985) 781-0804
ENSR Corporation	Fort Collins, Colorado	(800) 722-2440
Western Canadian Spill Services Co-op	Calgary, Alberta	(403) 250-9606
Saskatchewan Co-op Area 1 Chairman	Saskatchewan	(780) 573-7350
Saskatchewan Co-op Area 1 Alt. Chairman	Saskatchewan	(306) 387-6449
Saskatchewan Co-op Area 2 Chairman	Box 1132 Kindersley, Saskatchewan S0L 1S0	(306) 968-2503
Saskatchewan Co-op Area 2 Co-Chairman	Box 5 Coleville, Saskatchewan S0L 0K0	(306) 965-2731
Saskatchewan Co-op Area 2 Custodian	Saskatchewan	(306) 834-7898
Saskatchewan Co-op Area 3 Chairperson	Saskatchewan	(306) 773-0234
Saskatchewan Co-op Area 3 Secretary	Saskatchewan	(306) 773-9381
Saskatchewan Co-op Area 3 Custodian	Saskatchewan	(306) 672-3723
Saskatchewan Co-op Area 4&5 Chair	Saskatchewan	(306) 842-1818
Saskatchewan Co-op Area 4&5 Vice-Chair	Saskatchewan	(306) 842-3088
Saskatchewan Co-op Area 6 Call-out	Saskatchewan	(306) 791-5058
Albert Coop Area 1S Regional Custodian	Lethbridge, Alberta	(403) 329-0427
Alberta Coop Area 1S Equip. Custodian	Brooks, Alberta	(403) 362-6551
Alberta Coop Area 2U Custodian	Hardisty, Alberta	(780) 888-3845
Euroway Industrial Svc Co. Ltd	Winnipeg, Manitoba	(204) 661-0500

SECTION 2

RESPONSE ACTIONS

2.1 INITIAL RESPONSE ACTIONS

Initial response actions are those taken by local personnel immediately upon becoming aware of a discharge or emergency incident, before the Initial Response Team (described in Section 3.0) is formed and functioning. Timely implementation of these initial steps is of the utmost importance because they can greatly affect the overall response operation.

The pages that follow discuss initial response actions for a variety of emergencies that have the possibility of occurring. These emergencies are discussed in the order listed below:

- Initial Response
- Line Break or Leak
- Fire
- Severe Thunderstorm/Flash Flooding/Landslide
- Tornadoes
- Earthquake
- Winter Storm
- Volcanic Eruptions
- Bomb Threat
- Release to Groundwater
- Abnormal Operations

It is important to note that these actions are intended only as guidelines. The appropriate response to a particular incident may vary depending on the nature and severity of the incident and on other factors that are not readily addressed. Note that without exception, employees and public safety is first priority.

The first Company person on scene will function as the Incident Commander (IC) until relieved by an authorized supervisor who will assume the IC position. Transfer of command will take place as more senior management respond to the incident. The role of IC will typically be assumed and retained by area management.

The person functioning as Incident Commander during the initial response period has the authority to take the steps necessary to control the situation and must not be constrained by these general guidelines.

INITIAL RESPONSE ACTIONS -SUMMARY PERSONNEL AND PUBLIC SAFETY IS FIRST PRIORITY				
RESPONSE TIMES*				
US DOT Tier 1 2 3				
High Volume Area	6 HR	30 HR	54 HR	
All Other Areas	12 HR	36 HR	60 HR	
All Other Areas 12 HR 36 HR 60 HR CONTROL • Eliminate sources of ignition • Isolate the source of the discharge, minimize further flow NOTIFY • • Make internal and external notifications • Activate local Company personnel as necessary • Activate response contractors and other external resources as necessary • CONTAIN • Begin spill mitigation and response activities • Monitor and control the containment and clean-up effort • Protect the public and environmental sensitive areas				
* Response resources and personnel available to respond within time specified after discovery of a worst case discharge per US DOT 49 CFR Part 194.115				

In addition to the potential emergency events outlined in this Section, the Company has identified several "abnormal operations" that could be expected in the pipeline facilities. The Company has defined the events and established procedures to identify, eliminate or mitigate the threat of a worst case discharge due to these events. In compliance with 49 CFR 195.402(d), these procedures are defined in the Company's Operations Manual.

FIRST COMPANY PERSON NOTIFIED / ON SCENE

- Verify emergency exists.
- Follow the appropriate "Specific Incident Response Checklist" in Figure 2.2 and "Product Specific Response Considerations" in Figure 2.3.
- Notify the Oil Control Center of the incident.
- Contact / Utilize local emergency services as necessary (police, fire, medical).

REGIONAL EMERGENCY OPERATION CENTER

- Ensure local emergency agencies have been contacted (police, fire, medical).
- Assign personnel immediately to the discharge site to assist with emergency response (QI) and spill containment.
- Activate additional company and response contractors to site as situation demands.
- Confirm safety aspects at site, including need for personal protective equipment, sources of ignition, and potential need for evacuation.
- Evaluate the severity, potential impact, safety concerns and response requirements based on the initial data provided by the first person on scene. Refer to the spill response evaluation Flowchart in this section.
- Perform notifications using Figure 1.1 as appropriate.

AREA MANAGEMENT -EMERGENCY SITE MANAGEMENT

- Proceed to spill site and coordinate response and clean-up operations.
- Assume the role of Incident Commander.
- Coordinate/perform activation of additional spill response contractors, as the situation demands (telephone reference is provided in Figure 1.5).
- Direct containment, dispersion, and/or clean-up operations in accordance with the "Product Specific Response Considerations" provided in Figure 2.3.
- Complete the "Product Release Report".

LOCAL COMPANY PERSONNEL

- Assigned personnel will immediately respond to a discharge from the Pipeline or Facility, as the situation demands.
- Assist as directed at the spill site.

FIGURE 2.1 SPILL CLASSIFICATION

Spills/Releases to Environment:

Minor

• A spill/release, onsite, that poses no adverse affect to the environment nor impact neither to a water body nor to groundwater. The spill may or may not be reportable to a regulatory agency.

Serious

• A spill/release, onsite or off-site/off-right-of-way, that poses an adverse affect to the environment but no impact to a water body nor to groundwater.

Major

• A spill/release, onsite or off-site/off ROW, that poses an adverse affect to the environment including an impact to a water body or to groundwater.

Critical

• Emergency response for containment or clean up is required. A spill/release, onsite or off-site/off ROW, that poses an adverse affect to the environment including an impact to a water body or to groundwater.

Complaints -Health & Safety:

Minor

• Unverified community complaint from a Landowner, Police, Fire, Municipality, or a Ministry. Verified employee complaint where an investigation is required to obtain resolution.

Serious

• Verified community complaint likely to cause danger/risk to the public, employees or TransCanada facilities.

Major

• Employee work refusal based on belief of unhealthy or unsafe work conditions.

Critical

• Regulatory body notified of employee complaint (by employee) and investigates employee work refusal.

FIGURE 2.2 SPECIFIC INCIDENT RESPONSE CHECKLIST

INITIAL RESPONSE

- Take appropriate personal protective measures.
- Secure site.
- Call for medical assistance if an injury has occurred.
- Notify the Oil Control Center and area management of the incident.
- Eliminate possible sources of ignition in the near vicinity of the spill.
- Take necessary fire response actions.
- Advise personnel or public in the area of any potential threat and/or initiate evacuation procedures.
- Identify/isolate the source and minimize the loss of product.
- Restrict access to the spill site and adjacent area as the situation demands. Take additional steps necessary to minimize any threat to health and safety.
- Verify the type of product and quantity released. (Material Safety Data Sheet(s) are available).

All personnel are reminded that outsiders other than emergency services will not be allowed in the area during the time of an emergency and that statements issued to the media or other interested parties should be given by designated Company Management. Be courteous with media representatives and direct them to the designated spokesperson.

LINE BREAK OR LEAK, SPECIFIC RESPONSE (Including Piping Rupture/ Leak Valve Rupture/Leak and Manifold Failure)

- Shut down Pipeline.
- Close upstream and downstream block valves.
- Mitigate spreading of the product, as the situation demands. See Release to Groundwater, Specific Response for more detailed information. Potential containment land-based strategies include:
 - Earthen dike/berm
 - o Ditching
 - Spreading sorbent material over the spill
- Prevent the spill from entering the waterways, sewer, etc. to the greatest extent possible.
- Determine the direction and expected duration of spill movement. Refer to the maps in this plan.
- Review the location of socio-economic and environmentally sensitive areas identified in this plan and the Area Contingency Plan (ACP). Determine which of these may be threatened by the spill and direct the response operation to these locations. Initiate protection and recovery actions.
- Response contractor under TransCanada direction utilizes Combustible Gas Indicator, Oxygen meter, proper colormetric indicator tubes and/or other air sampling measurements to assure that areas are safe to enter for continued response operations. Refer to Vapor Cloud Specific Response, later in this Figure, if flammable vapors are detected.
- Drain the line section, as the situation demands.
- Inform local operators of utilities such as the power company, telephone company, railway.
- Clean up spilled product to eliminate any possible environmental problems. Be alert for underground cables.
- Make all necessary repairs.
- Return the line to service when repairs are complete, if or when approved.
- Complete follow-up and written reporting, as the situation demands.

FIRES (MINOR, MAJOR, EXPLOSION) SPECIFIC RESPONSE

Be aware of Fire Weather conditions.

- Watch -Critical fire weather conditions are forecast to occur.
- Red Flag Warning -Critical Fire weather conditions are either occurring or will shortly.

INDIVIDUAL DISCOVERING THE FIRE - (All Employees)

Call the Local Emergency Response Agency (911).

Note: Pipeline right-of-ways are used by Firefighters as a fire break (barrier) to isolate fires and prevent them from growing in size. Right-of-ways are commonly used to access to fire areas. Many times Firefighters will need to increase the size of the cleared space over the Pipeline right-of-way to prevent the fire from leaping from tree top to tree top. To do this, heavy equipment may be used to quickly increase the amount of cleared space between the fire area and unignited forest. The following are steps to consider when working with the local authority on creating these fire breaks.

- Use your best judgment to ensure the safety of staff, fire ground workers and the public when determining if this activity is safe to perform;
- Call and confirm with Asset Reliability if this activity is safe and implement any instructions provided by Asset Reliability. Asset Reliability's role is to provide directions to protect the health and safety of those involved as well as pipeline integrity;
- Be physically on site to coordinate the activities related to any pipeline crossings;
- Stake the pipeline to identify the location of the pipe(s) in the right-of-way.
- First preference is to use already existing pipeline crossing areas;
- Gather the appropriate information to complete a formal pipeline crossing agreement. In Canada, send required information to the Land Department in Calgary.
- Notify the Oil Control Center and area management.
- Shut off pumps.
- Coordinate with the Oil Control Center to close appropriate valves to isolate fire, if necessary.
- Isolate Pump Station from Mainline.
- Evacuate site as safety considerations dictates.
- Notify the Oil Control Center of evacuation route and final destination.
- Notify the Oil Control Center of safe arrival.
- Inspect pump station, equipment and controls after the fire is extinguished and safe to return.
- Evaluate pipeline, monitoring or control systems for evidence of heat damage.
- Notify engineering to conduct further investigation if damage is found.
- Make appropriate repairs and return Pipeline to service.

SEVERE THUNDERSTORM (Flash Flooding/Landslide) SPECIFIC RESPONSE

Thunderstorms are a year round occurrence with lightning a major threat. The potential of flash flooding is also possible when one area is affected for an extended period.

- Be aware of changing weather conditions.
 - Severe Thunderstorm Watch -Conditions are favorable to the development of thunderstorms.
 - Severe Thunderstorm Warning -A severe thunderstorm has been observed or is imminent.
 - Flash Flood Watch-Flash flooding is possible within 6 hours after heavy rains have ended.
 - Flash Flood Warning -Flash flooding is occurring or imminent.
- Terminate outdoor work when lightning is occurring and move to shelter.
- Avoid areas subject to sudden flooding until the thunderstorm passes.
- Evaluate the situation after weather event.
 - Does standing water prevent visual inspection?
 - Have flood waters damaged the Pipeline?
 - Have flood waters exposed buried piping?
 - Has soil shifted that could lead to a landslide?
- Initiate appropriate pipeline patrol by the most expedient means possible to determine extent of damage.
- Make all necessary repairs.
TORNADO/STRAIGHT LINE WINDS SPECIFIC RESPONSE

Although many disasters cannot be prevented or predicted, preparation can significantly reduce losses. In the event of a severe weather condition or a natural disaster, the Area Manager or assigned designee will be the Emergency Coordinator.

• Be Aware of Changing Weather Conditions

- Tornado watch -Conditions are right for the formation of a tornado.
- Tornado warning -A tornado has been sighted but is not in the area at this time.
- Tornado alert -A tornado has been sighted in the immediate area, take cover immediately.

If Severe Weather Conditions Threaten

- Carry a battery operated portable radio and monitor conditions.
- If a tornado is observed and time permits, evacuate the area.
- If the tornado is approaching a pump station, notify the Oil Control Center to remotely isolate the station.
- In vehicle, drive away from tornado at right angle. Get out of car and seek shelter if tornado cannot be avoided.
- If outdoors, shelter in ditch, excavation or other low spot and lie flat, face down.
- Make certain that all personnel are aware of the condition.
- Stay in shelter until conditions are safe.

Immediately After the Storm

- Account for all personnel.
- Survey for damages.
- Initiate team for any repairs.
- Refer to this Plan for additional response guidance regarding fires, spills, etc., as needed.

EARTHQUAKE SPECIFIC RESPONSE

The actual movement of the ground in an earthquake is rarely the direct cause of death or injury. Most casualties result from falling objects and debris because the shocks can shake, damage or demolish buildings and other structures.

• Stay calm. Don't panic.

- If you are indoors, stay there. Do not run outside.
- If you are in a building, take cover under a heavy furniture or stand in an inside doorway away from windows. (A door frame or the inner core of a building is its strongest point and least likely to collapse.)
- Exit building as situation determines.
- If you are outside, stay there. Move away from buildings to avoid falling debris. Avoid damaged utility lines.
- If you are driving, stop quickly and stay in your car. If possible, do not stop on a bridge, overpass or where buildings can fall on you. Your car can provide protection from falling debris.
- Do not reenter damaged buildings. Walls may collapse after the original shaking has ceased.
- Evaluate the situation and initiate appropriate pipeline patrol by the most expedient means possible to determine extent of damage.
- Make all necessary repairs as resources and conditions allow.

SEVERE WINTER STORM SPECIFIC RESPONSE

- Be aware of Changing Weather Conditions
 - Winter Storm Watch -Conditions are expected but not imminent.
 - Winter Storm Warning -A significant winter storm is occurring, imminent, or likely.
 - Blizzard Warning -Winds at least 35 mph, blowing snow frequently reducing visibility to 0.25 miles or less, and dangerous wind chills are expected.
- Listen to local radio stations for weather advisory and road condition reports, carry a survival kit, and start the trip with a full tank of gasoline.
- Inspect pump station, equipment, and controls after storm for damage.
- Make any repairs as necessary.

VOLCANIC ERUPTIONS SPECIFIC RESPONSE

If a volcanic eruption ejects a large ash plume and the wind carries the ash to the pipeline facilities, this may cause a disruption of operations by making travel difficult or impossible due to reduced visibility.

- Begin gathering information from news media, field personnel, etc. to assess any ash cloud size, location, heading and speed as soon as news of an eruption breaks.
- Consider recalling crews prior to the expected arrival of the ash cloud while it is still clear to travel. If a crew is at a station when an ash fall begins, they should probably stay there for the duration and not travel until it is determined to be safe after the event.
- Advise contract aerial patrol service of the situation if contacted for the beginning of a pipeline patrol or if an aerial patrol is in progress.
- Inspect pump station, equipment and controls after eruption for damage.
- Make any repairs as necessary.

BOMB THREATS SPECIFIC RESPONSE

The following pages provide guidelines for actions to be taken in the event a bomb threat is received. A bomb threat to the pipeline system or personnel may present itself in any of several ways:

- Phone
- E-mail
- Fax
- Radio
- Mail
- Word-of-mouth
- Increase in the Homeland Defense Status

Other threats to pipeline system or personnel are often treated in the same manner as bomb threats. These may include:

- Terrorist threats
- Workplace violence threats
- General threat to an industry
- Civil disturbances

The following steps should be used as guidance when responding to the above situations. Actions during a real event will vary based on differences in circumstances, response activities, good judgment, etc.

PHONE / WRITTEN (Fax, Letter, Telegram) THREATS

Person Receiving the Call

- Immediately open the Bomb Threat form, (this should be kept next to the phone), so you can use it during the conversation with the individual making the bomb threat call. If possible, complete the form during the call.
- Remain calm and be engaging when talking to the caller.
- Keep the caller on the line as long as possible in order to obtain as much information as possible. Ask him/her to repeat the message. Try to write down every word spoken by the person. If you have a small hand-held tape recorder available, try to tape the conversation.
- If the caller does not indicate the location of the bomb or the time of detonation/attack, ask for this information.
- Inform the caller that the incident could result in death or serious injury to innocent people.
- Pay particular attention to background noises, such as motors, music, and any other noise that may give a clue as to the location of the caller.
- Listen closely to the voice (male, female), voice quality (calm, excited), accents, and speech impediments.

AFTER THE CALLER HANGS UP AND WRITTEN THREATS

• Immediately report the threat call to the Oil Control Center or the Company person designated by management to receive such information.

Pipelines and Pump Stations -Additional Guidance

- If the caller does not indicate the location of the bomb / substance or the time of possible detonation/attack, ask him / her for this information. Try to determine the Provice / State, pipeline system, and specific location involved if possible.
- For offices and control center, inform the caller that the building/facility is occupied and the incident could result in death or serious injury to innocent people.
- For pipeline and pump stations, inform the caller that an incident could result in death of the innocent general public or significant environmental impact.

Area Manager/Designee

- Based upon discussion with Corporate Security, determine if the threat is credible. Then decide what actions to take, which can include:
 - o Do Nothing
 - Attempt to determine which facility(s) are at risk
 - Stay and Search
 - Partial Evacuation or Internal Evacuation (offices or control center)
 - External Evacuation to an offsite Command Post (offices or control center)
- If a full or partial facility evacuation is necessary, activate Building Evacuation Plan immediately. When in doubt, evacuate. Encourage personnel to be vigilant for suspicious or out-of-place objects as they evacuate and leave their workstations.
- Initiate operations "shut down" procedures, as necessary.
- Secure the location and limit access to essential personnel only.
- Call the appropriate local and/or government agencies (fire, police, etc.) listed in Figure 1.5 and inform them of the threat and your Command Post location.
- Set up a Command Post at a pre-determined offsite location. Ensure you have:
 - o Emergency Response Plan
 - Facility maps
 - Access keys
 - o Cell Phones, Pagers & Radios
- Direct all members of the press to the designated spokesperson.

PIPELINES AND PUMP STATIONS SEARCH GUIDELINES

- Additional actions to consider taking upon credible threats against pipelines and pump stations:
 - Which if any system(s) should be shutdown
 - When any system(s) should be shutdown
- Survey from a distance with the aid of binoculars:
 - o valves
 - station piping
- Due to the expanse of Pipeline facilities, aircraft should be considered to aid in the surveying pipeline ROW.
- Notify the appropriate local and/or government agencies listed in Figure 1.5 upon discovery of suspicious or out-of-place object(s).

SUSPICIOUS MAIL / DELIVERED PACKAGES

- Frequently seen explosive devices have been incorporated, hidden, or camouflaged in letters, soft cover pocketbooks, hard cover books, manila envelopes, and cardboard boxes. While many are delivered by Canadian or U.S. mail, they may arrive by private courier or express service. Be alert to recognize suspicious-looking or unexpected items especially those that have:
 - Special handling marks (special delivery, air mail, registered, certified)
 - Restrictive markings (personal, confidential, addressee only)
 - Excessive postage
 - Handwritten or poorly typed address
 - o Incorrect title, or title but no names
 - Misspelling of common words
 - Oily stains, discolorations, or odor
 - No return address
 - Excessive weight
 - Lopsided, uneven, or ridged envelope
 - Protruding wires or tin foil
 - Excessive securing material (tape, string, etc.)
 - Any evidence that the envelope has been opened and re-glued
 - Mail item from a new or strange source

- If you receive or find a suspicious-looking letter or package:
 - DO NOT TRY TO OPEN IT.
 - Isolate the area around the letter or package to the degree possible, and make emergency notifications as previously outlined, and evacuate personnel to a safe distance, as directed.
 - DO NOT MOVE NOR HANDLE unless absolutely necessary.
 - If opened, preserve, BUT DO NOT TOUCH FURTHER all original envelopes, twine, shipping documents, or packaging materials for evidence and release to the police as requested.
 - Report the call to the Regional Manager or their designee.

RELEASE TO GROUNDWATER SPECIFIC RESPONSE

- Evaluate the topography and evidence of surface contamination.
- Establish containment, accounting for public safety, spill volume, terrain, and presence of surface water.
- Notify landowner and appropriate public agencies of potential groundwater contamination.
- Immediately retain an independent consultant with expertise in this area to evaluate impacts and remediation options.
- Consult with appropriate agencies regarding remediation, including water and soil cleanup levels, and need for groundwater monitoring.
- Notify and procure additional response equipment and personnel as necessary to address site-specific conditions.
- Dig intercept trench downgradient of release point.
- Line trench and stage vacuum truck to remove contaminated oil/water mixture.
- Excavate surface catchment upgradient of the intercept trench and near leading edge of visible contamination.
- Excavate until contaminated soil is completely removed and clean soil is encountered or conditions prohibit continued digging.
- Line the catchment to limit or prohibit further groundwater contamination.
- Move vacuum truck from intercept trench to catchment to recover oil and/or oily water.
- Line drop down area to stage contaminated soil as excavated.
- Segregate waste streams to minimize later disposal.
- Based on anticipated release, stage temporary storage and additional vacuum trucks to ensure recovery efforts continue without interruption.

Options for Long term Remediation:

- Air sparging
- Vacuum extraction
- Conventional pump and treat
- o Bioslurping
- o Excavation
- Enhanced biodegradation/bioremediation
- Chemical addition/oxidation
- Natural Attenuation
- Enlist additional experts, as appropriate, for continuing remediation and coordination with appropriate agencies.

ABNORMAL OPERATIONS SPECIFIC RESPONSE

- If operating design limits have been exceeded (increase or decrease pressure or flow) and no emergency condition exists, stop operations and immediately investigate the pipeline.
- Verify whether a true safety problem, equipment malfunction, or operator error is present. Note: In all cases, safety to operations, the general public, and property will govern actions taken.
- Make appropriate repairs before continuing operations. Note: Corrective action will only be done by qualified personnel to perform the type of work involved.
- Monitor affected systems until normal operations are resumed.
- Complete follow-up and written reporting, as the situation demands.

Note: It is the responsibility of the pipeline operator to carry out the response procedures for abnormal pipeline operations as outlined in their respective O&M Manual.

2.2 DOCUMENTATION OF INITIAL RESPONSE ACTIONS

It is difficult, particularly during the first few minutes of an initial response operation, to think about the importance of documentation. A log should be maintained which documents the history of the events and communications that occur during the response. When recording this information, it is important to remember that the log may become instrumental in legal proceedings, therefore:

- Record only facts, do not speculate.
- Do not criticize the efforts and/or methods of other people/operations.
- Do not speculate on the cause of the spill.
- Do not skip lines between entries or make erasures. If an error is made, draw a line through it, add the correct entry above or below it, and initial the change.
- Record the recommendations, instructions, and actions taken by government/regulatory officials.
- Document conversations (telephone or in person) with government/regulatory officials.
- Request that government/regulatory officials document and sign their recommendations or orders (especially if company personnel do not agree with the suggestions, instructions, or actions).

2.3 OIL CONTAINMENT, RECOVERY AND DISPOSAL/WASTE MANAGEMENT

After initial response has been taken to stop further spillage and notifications made to the required agencies, the Company will begin spill containment, recovery, and disposal operations.

The Incident Commander will assess the size and hazards of the spill (see Figure 2.3). The type of product, the location of the spill, and the predicted movement of the spill will be considered.

Based on this assessment, additional clean-up personnel and equipment will be dispatched to the site and deployed to control and contain the spill. Boom may be deployed in waterways to contain the spill and to protect socio-economic and environmentally sensitive areas. Booms may also be used in waterways to deflect or guide the spill to locations where it can more effectively be cleaned up using skimmers, vacuum trucks, or sorbent material. Clean-up equipment and material will be used in the manner most effective for rapid and complete clean-up of all spilled product.

Response and clean-up will continue until all recoverable product is removed, the environment is returned to its pre-spill state, and the Unified Command of the Company Incident Commander and the Federal and/or State On-Scene Coordinators determine that further response and cleanup is no longer necessary.

FIGURE 2.3

FLAMMABLE LIQUIDS (Non-Polar/Water-Immiscible)

The following information is intended to provide initial responder(s) with data that may be useful in making quick decisions and executing prompt response actions. The information is intended for guideline purposes only.

PRODUCTS: Crude Oil

HAZARD IDENTIFICATION / RECOGNITION		
GUIDE NO. 128	 DANGERS HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back. Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks). Vapor explosion hazard indoors, outdoors or in sewers. Those substances designated with a "P" may polymerize explosively when heated or involved in a fire. Runoff to sewer may create fire or explosion hazard. Containers may explode when heated. Many liquids are lighter than water. Substance may be transported hot. If molten aluminum is involved, refer to Emergency Response Guide No. 169. 	

HEALTH

1. Move victim to fresh air. Call 911 or emergency medical service.

- 2. Apply artificial respiration if victim is not breathing. Administer oxygen if breathing is difficult.
- 3. Remove and isolate contaminated clothing and shoes.
- 4. In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- 5. Wash skin with soap and water.
- 6. Keep victim warm and quiet.
- 7. Ensure that medical personnel are aware of the material(s) involved, and take precautions.

PUBLIC SAFETY

1. Isolate spill or leak area immediately for at least 50 meters (150 feet) in all directions.

- 2. Keep unauthorized personnel away.
- 3. Stay upwind.
- 4. Keep out of low areas.
- 5. Ventilate closed spaces before entering.

EVACUATION	Large Spill 1. Consider initial downwind evacuation for at least 300 meters (1,000 feet). Fire 1. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also, consider initial evacuation for 800 meters (1/2 mile) in all directions.
------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Information provided by the Emergency Response Guidebook 2008.

TransCanada-Keystone

2.4 STORAGE/DISPOSAL

Strict rules designed to ensure safe and secure handling of waste materials govern the Company waste disposal activities. To ensure proper disposal of recovered oil and associated debris, the following guidelines should be considered:

- In the event of a product spill, Facilities have limited capacity to store recovered product and water. Separated product is pumped to frac tanks or to trucks to be carried to the Facility for processing.
- Oily debris will be segregated on site and containerized for temporary storage prior to disposal in accordance with hazardous waste regulations.
- Transportation of waste material will be performed in accordance with all applicable Federal and State Regulations.
- Waste associated with the spill will be disposed at sites that have the necessary permits to accept the type of waste to be discharged.

The Company's Community, Safety and Health Administration Dept. will coordinate activities and secure the permits to ensure proper disposal or recycling of recovered product and debris.

2.5 SAMPLING AND WASTE ANALYSIS PROCEDURE

The Company's sampling and waste analysis practices are governed by the regulations for the applicable Province/State and Federal agency. These regulations outline methods and procedures for determining the chemical and physical characteristics of wastes generated by the Facility, including waste associated with spills, so that they may be properly stored, treated, or disposed.

2.6 SAFETY AWARENESS

It is the corporate policy of the Company to provide a safe workplace for all workers. All employees and contractors are responsible for maintaining the safety and health of all workers on the pipeline and the response operations.

Prior to engaging in any spill response activity:

- All employees/contractors must have received orientation from the Company Safety Plan.
- All U.S. contractor response personnel must be in compliance with Occupational Safety and Health Administration training requirements.
- All other personnel will have completed appropriate training for their position as outlined in Section 3.0.
- No employee/contractor shall engage in activities which place them at risk without the appropriate protective equipment and training.

Response Safety

All Company and contractor personnel are expected to comply with the Site Safety Plan for each spill incident.

- Any concern regarding health or safety issues should be immediately addressed.
- The First Responder must consider the spill site as dangerous and the local atmosphere explosive until air monitoring procedures prove that the area is safe.
- The First Responder must exit the area against or across the wind, if possible, and must also evacuate others who are working in the area.
- All injuries, no matter how minor, must be reported to the Incident Commander in a timely manner.
- Prior to entering a spill area, a qualified person must perform an initial safety and health evaluation of the site.

Air Monitoring

A Safety Monitor shall be designated who is trained in the operation of air monitoring equipment. The Incident Commander must ensure that Safety Monitors are trained and that their equipment is maintained and ready for use.

- The air monitoring equipment shall be activated and checked at the location in which it is stored.
- Calibration of instruments should be performed before use.
- Air monitoring measurements which are to be made prior to entry into the spill area include:
 - Oxygen content
 - Lower Explosive Limit (LEL)
 - o Benzene level
- Lower Explosive Limit readings above 10% require immediate evacuation of the area and elimination of ignition sources.
- Oxygen readings below 19.5% require the use of air supplied respiratory protection.
- After assuring that there are no hazards relating to explosion or oxygen depletion, sampling for benzene or total petroleum hydrocarbons shall dictate the appropriate respiratory devices to be used by persons entering the area.
- Benzene levels must be below .5 ppm to work without respiratory protection. At a level of greater the.5 but less than 10 ppm a half face repirator may be used. When the level is between 50 and 100ppm a full face repirator must be used. Anything readings higher than 50 ppm, a supplied air or SCBA must be used.
- Hydrogen Sulfide is an extremely hazardous toxic compound that is present in most crude oils that are transported through the pipeline.

- Passive air monitoring for Hydrogen Sulfide will be done by all personnel working on or near the pipeline and during any cleanup operation.
 - Hydrogen Sulfide is characterized by a rotten egg smell.
 - The gas causes rapid temporary paralysis of the olfactory system leading to the loss of the sense of smell.
 - Permissible exposure limits in many countries is 10 ppm.
- Symptoms of exposure to Hydrogen Sulfide are:
 - 0-10 ppm causes Irritation of the eyes, nose and throat
 - 10-50 ppm can cause headache, dizziness, nausea, vomiting and breathing difficulty
 - 50-100 ppm can cause severe respiratory irritation, shock, convulsions, coma and even death.
- The Incident Commander is responsible for industrial hygiene monitoring in the post discovery period.

Decontamination

Through training programs, Facility personnel know and understand the importance of the removal of hazardous substances from their person if they are contaminated. Eyewash stations and safety showers provide a means to quickly remove gross contamination of harmful agents, including gasoline. Personnel must immediately shower and remove any clothing which is wet or otherwise contaminated. Showers in the change room are to be used for thorough cleansing. Persons should inspect themselves thoroughly before donning a fresh change of clothing.

Contaminated clothing should be properly disposed. Contaminated personal protective equipment must be washed and sanitized before re-using. The washing of contaminated equipment is performed in a "contained area" to assure that the disposal of the wash water can be handled properly.

Establishing "Exclusion -Hot", "Decontamination - Decon", and "Support -Safe" Zones are required to prevent the removal of contaminants from the contaminated area as well as unauthorized entry into contaminated areas.

- Regardless of the decontamination facilities available, all efforts to minimize personnel exposure should be taken.
- Decontamination facilities should be positioned prior to employee/ contractor entrance to areas where the potential for exposure to contamination exists. The appropriate Material Safety Data Sheets (MSDS) are available to aid health professionals treating the injured parties. Material Safety Data Sheets are located in Appendix G.
- Decontamination facilities should be designed to prevent further contamination of the environment and should have a temporary storage area for items that will be reused in the contaminated area.
- Particular attention should be paid to personal hygiene prior to eating, drinking, or smoking.





Personal Protective Equipment (PPE)

The following represents OSHA/USEPA designated PPE levels for responding to emergencies, post emergency cleanup sites, and/or Temporary Storage and Disposal (TSD) sites. The responder's PPE should be chosen based on his/her level of training and assigned job duties.

Personal Protective Equipment (PPE)		
LEVEL A • Self Contained Breathing Apparatus (SCBA) (worn inside suit) • Encapsulated Chemical Protective Suit • Chemical Protective Gloves • Chemical Protective Boots • Hard Hat • Safety Toe Footwear • Safety Glasses	To be selected when the greatest level ok skin, respiratory, and eye protection is required.	
<u>LEVEL B</u> • SCBA (worn outside suit) • Chemical Protective Suit w/Hood • Chemical Protective Boots • Chemical Protective Gloves • Hard Hat • Safety Toe Footwear • Safety Glasses	To be selected when the highest level of respiratory protection is necessary but a lesser level ok skin is needed.	
LEVEL C • Air Purifying Respirator (APR) • APR a ¹ / ₂ Face / Full Face • Hard Hat • Glasses (worn with a ¹ / ₂ face APR) • Chemical Protective Boots • Chemical Protective Gloves • Chemical Protective Gloves • Chemical Protective Suit/Tyvek • Safety Toe Footwear • Safety Glasses	To be selected when the concentration and type of airborne substances is known and the criteria for using air purifying respirators are met.	
MODIFIED LEVEL C Same as Level C, except no APR requirements.	To be selected when the concentration and type of airborne substances is known and the criteria for using air purifying respirators are met.	
LEVEL D • Hard Hat • Safety Glasses • Work Uniform / Clothes • Leather Gloves • Safety Boots • Nomex (if required by the Company)	The atmosphere contains no known hazard and work functions preclude the potential for unexpected inhalation of or contact with hazardous levels of any chemicals.	

2.7 EMERGENCY MEDICAL TREATMENT AND FIRST AID

Call 911 immediately. On-site emergency medical response requires the same rapid assessment of the patient as any other situation, but requires the responders to be aware of other considerations that may affect the way they handle the patient. These considerations include the following:

- The potential for contamination of the patient, responders, and equipment should be addressed. Responders should arrange to treat all patients AFTER the injured party has been decontaminated according to the Site Safety Plan.
- Site personnel should make the initial assessment of the patient and determine the severity of the injury/illness.
- If the treatment needed is critical care or "life saving" treatment, rapid decontamination of the injured/ill party should be started. Refer to the Site Safety Plan for steps to be taken in an "abbreviated" decontamination for medical treatment.
- The need for full decontamination should be carefully weighed against the need for prompt medical treatment.
- The ambulance responding to medical emergencies shall be contacted as soon as possible and instructed exactly where to respond when needed and the nature of the contaminant. Telephone reference is provided in Annexes.
- Material Safety Data Sheet information will be available from the Incident Commander and should be provided to medical personnel to alert them of decontamination requirements.
- Report all injuries, incidents or close calls.
- If emergency medical treatment is needed, the Incident Commander, or his designated representatives, will request assistance from trained medical personnel.

SECTION 3

RESPONSE TEAMS

3.1 INTRODUCTION

This Section describes organizational features and duties of the local responders, the Regional Emergency Preparedness Team (EPT), and the broader Emergency Management Team (EMT) as defined in TransCanada's Incident Management System (IMS). The Incident Management System integrates Incident Management, Emergency Management and Crisis Management and is maintained separately.

The key to an effective emergency response is a rapid, coordinated, tiered response by the affected Facility, the Regional Emergency Operations Center, and the Corporate Emergency Operations Center, consistent with the magnitude of an incident.

First response to an incident at the Facility will be provided by the local responders. The Regional EOC will respond, to the degree necessary, to incidents exceeding local capability.

Our response teams will use the National Incident Management System (NIMS) Incident Command System (ICS) to manage the emergency response activities. Because Incident Commander System is a management tool that is readily adaptable to incidents of varying magnitude, it will typically be used for all emergency incidents. Staffing levels will be adjusted to meet specific response team needs based on incident size, severity, and type of emergency.

An explanation of Incident Commander System and the roles and responsibilities for primary members of the response teams are provided in Section 3.7 per CAN/CSA-2731-03. The USCG Incident Management Handbook (IMH) contains an in-depth description of all Incident Commander System positions, Incident Commander System development, response objectives and strategies, command responsibilities, Incident Commander System specific glossary/acronyms, resource typing, the Incident Action Plan process, and meetings. The IMH can be located on the USCG's Homeport Website.

3.2 QUALIFIED INDIVIDUAL

It is the responsibility of the Qualified Individual (QI) or his/her designee to coordinate with the Federal On-Scene Coordinator (FOSC) and State On-Scene Coordinator (SOSC) throughout the response, if applicable.

Vital duties of the Qualified Individual (QI) include:

- Notify all response personnel, as needed.
- Identify the character, exact source, amount, and extent of the release, as well as the other items needed for notification.
- Assess the interaction of the spilled substance with water and/or other substances stored at the Facility and notify response personnel at the scene of that assessment.

- Assess the possible hazards to human health and the environment due to the release. This assessment must consider both the direct and indirect effects of the release (i.e., the effects of any toxic, irritating, or asphyxiating gases that may be generated or the effects of any hazardous surface water runoffs from water or chemical agents used to control fire and heat-induced explosion).
- Assess and implement prompt removal actions to contain and remove the substance released.
- Coordinate rescue and response actions as previously arranged with all response personnel.
- Activate and engage in contracting with oil spill removal organizations.
- Use authority to immediately access Company funding to initiate cleanup activities.
- Direct cleanup activities until properly relieved of this responsibility.
- Arrangements will be made to ensure that the Qualified Individual (QI) or the Alternate Qualified Individual (AQI) is available on a 24-hour basis and is able to arrive at the Facility in a reasonable time.
- The AQI shall replace the QI in the event of his/her absence and have the same responsibilities and authority.

3.3 INITIAL RESPONSE TEAM (IRT)

The first Company person on scene will function as the Incident Commander and person-in-charge until relieved by an authorized supervisor who will then assume the position of Incident Commander (IC). Transfer of command will take place as more senior management contract support respond to the incident. For response operations within the control of the Initial Response Team, the role of IC will typically be assumed and retained by the Qualified Individual.

The number of positions/personnel required to staff the Initial Response Team will depend on the size and complexity of the incident. The duties of each position may be performed by the IC directly or delegated as the situation demands. The IC is always responsible for directing the response activities and will assume the duties of all the primary positions until the duties can be delegated to other qualified personnel.

A complete functional ICS organization is shown in Figure 3.1. The Initial Response Team should try to fill the necessary positions and request additional support from the Crisis Response Team to fill/back up all the positions as the incident may dictate. Detailed job descriptions of the primary response team positions are provided in Section 3.7.

3.4 REGIONAL EMERGENCY PREPAREDNESS TEAM (EPT)

The Emergency Preparedness Team (EPT) supports the Initial Response Team. The number of positions/personnel required to staff the EPT will depend on the size and complexity of the incident.

The Regional Emergency Preparedness Team is staffed by personnel from various Regional locations. The EPT provides necessary information to the appropriate Federal, State/Province, and Local authorities with designated response roles, including the National Response Center (NRC), the Canadian National Energy Board (NEB), if necessary, State Emergency Response Commission (SERC) Provincial Ministry, and local response agencies.

3.5 INCIDENT COMMAND SYSTEM (ICS)

The Incident Command System is intended to be used as an emergency management tool to aid in mitigating all types of emergency incidents. This system is readily adaptable to very small emergency incidents as well as more significant or complex emergencies. The Incident Command System utilizes the following criteria as key operational factors:

- Assigns overall authority to one individual
- Provides structured authority, roles and responsibilities during emergencies
- The system is simple and familiar, and is used routinely at a variety of incidents
- Communications are structured
- There is a structured system for response and assignment of resources
- The system provides for expansion, escalation, and transfer/transition of roles and responsibilities
- The system allows for "Unified Command" where agency involvement at the command level is required

Effective establishment and utilization of the Incident Command System during response to all types of emergencies can:

- Provide for increased safety
- Shorten emergency mitigation time by providing more effective and organized mitigation
- Cause increased confidence and support from local, State, Federal, and public sector emergency response personnel
- Provide a solid cornerstone for emergency planning efforts

Section 3.7 provides a comprehensive list of every response team member's duty assignment.

3.6 UNIFIED COMMAND

As a component of an Incident Commander System, the Unified Command (UC) is a structure that brings together the Incident Commanders of all major organizations involved in the incident to coordinate an effective response while still meeting their own responsibilities. The Unified Command links the organizations responding to the incident and provides a forum for the Responsible Party and responding agencies to make consensus decisions. Under the Unified Command, the various jurisdictions and/or agencies and responders may blend together throughout the organization to create an integrated response team. The Incident Commander System process requires the Unified Command to set clear objectives to guide the on-scene response resources.

Multiple jurisdictions may be involved in a response effort utilizing Unified Command. These jurisdictions could be represented by any combination of:

- Geographic boundaries
- Government levels
- Functional responsibilities
- Statutory responsibilities

The participants of Unified Command for a specific incident will be determined taking into account the specifics of the incident and existing response plans and/or decisions reached during the initial meeting of the Unified Command. The Unified Command may change as an incident progresses, in order to account for changes in the situation.

The Unified Command is responsible for overall management of an incident. The Unified Command directs incident activities and approves and releases resources. The Unified Command structure is a vehicle for coordination, cooperation and communication which is essential to an effective response.

Unified Command representatives must be able to:

- Agree on common incident objectives and priorities
- Have the capability to sustain a 24-hour-7-day-per-week commitment to the incident
- Have the authority to commit agency or Company resources to the incident
- Have the authority to spend agency or Company funds
- Agree on an incident response organization
- Agree on the appropriate Command and General Staff assignments
- Commit to speak with "one voice" through the Public Information Officer or Joint Information Center
- Agree on logistical support procedures
- Agree on cost-sharing procedures

FIGURE 3.1 INCIDENT COMMAND SYSTEM

INCIDENT MANAGEMENT SYSTEM



3.7 ICS ROLES AND RESPONSIBILITIES

COMMON RESPONSIBILITIES

The following is a checklist applicable to all personnel in an Incident Commander System organization:

- Receive assignment, including:
 - Job assignment
 - Resource order number and request number
 - Reporting location
 - Reporting time
 - Travel instructions
 - Special communications instructions
- Upon arrival, check-in at designated check-in location.
- Receive briefing from immediate supervisor.
- Acquire work materials.
- Supervisors maintain accountability for assigned personnel.
- Organize and brief subordinates.
- Know your assigned radio frequency(s) and ensure communications equipment is operating properly.
- Use clear text and Incident Commander System terminology (no codes) in all communications.
 - Complete forms and reports required of the assigned position and send to Documentation Unit.
- Maintain unit records, including Unit Log (ICS Form 214).
- Respond to demobilization orders and brief subordinates regarding demobilization.

UNIT LEADER RESPONSIBILITIES

In Incident Commander System, a Unit Leader's responsibilities are common to all units in all parts of the organization. Common responsibilities of Unit Leaders are listed below.

- Review common responsibilities.
- Receive briefing from Incident Commander, Section Chief or Branch Director, as appropriate.
- Participate in incident planning meetings, as required.
- Determine current status of unit activities.
- Order additional unit staff, as appropriate.
- Determine resource needs.
- Confirm dispatch and estimated time of arrival of staff and supplies.
- Assign specific duties to staff; supervise staff.
- Develop and implement accountability, safety and security measures for personnel and resources.

Supervise demobilization of unit, including storage of supplies.

- Provide Supply Unit Leader with a list of supplies to be replenished.
- Maintain unit records, including Unit Log (ICS Form 214).

COMMAND



INCIDENT COMMANDER

- Assess the situation and/or obtain a briefing from the prior Incident Commander.
- Determine Incident Objectives and strategy.
- Establish the immediate priorities.
- Establish an Incident Command Post.
- Brief Command Staff and Section Chiefs.
- Review meetings and briefings.
- Establish an appropriate organization.
- Ensure planning meetings are scheduled as required. (Refer to Figure 3.2, The Operational Planning "P" for assistance).
- Approve and authorize the implementation of an Incident Action Plan.
- Ensure that adequate safety measures are in place.
- Coordinate activity for all Command and General Staff.
- Coordinate with key people and officials.
- Approve requests for additional resources or for the release of resources.
- Keep agency administrator informed of incident status.
- Approve the use of trainees, volunteers, and auxiliary personnel.
- Authorize release of information to the news media.
- Ensure incident Status Summary (ICS Form 209-CG) is completed and forwarded to appropriate higher authority.
- Order the demobilization of the incident when appropriate.
- Assign any of the Incident Commander roles and responsibilities to a Deputy Incident Commander as needed.

PUBLIC INFORMATION OFFICER

- Determine from the Incident Commander if there are any limits on information release.
- Develop material for use in media briefings.
- Obtain Incident Commander approval of media releases.
- Inform media and conduct media briefings.
- Arrange for tours and other interviews or briefings that may be required.
- Obtain media information that may be useful to incident planning.
- Maintain current information summaries and/or displays on the incident and provide information on the status of the incident to assigned personnel.

LIAISON OFFICER

- Be a contact point for Agency Representatives.
- Maintain a list of assisting and cooperating agencies and Agency Representatives. Monitor check-in sheets daily to ensure that all Agency Representatives are identified.
- Assist in establishing and coordinating interagency contacts.
- Keep agencies supporting the incident aware of incident status.
- Monitor incident operations to identify current or potential inter-organizational problems.
- Participate in planning meetings, providing current resource status, including limitations and capability of assisting agency resources.
- Coordinate response resource needs for Natural Resource Damage Assessment and Restoration (NRDAR) activities with the Operations during oil and HAZMAT responses.
- Coordinate response resource needs for incident investigation activities with the Operations.
- Ensure that all required agency forms, reports and documents are completed prior to demobilization.
- Coordinate activities of visiting dignitaries.

SAFETY OFFICER

- Participate in planning meetings.
- Identify hazardous situations associated with the incident.
- Review the Incident Action Plan for safety implications.
- Exercise emergency authority to stop and prevent unsafe acts.
- Investigate accidents that have occurred within the incident area.
- Review and approve the medical plan.
- Develop the Site Safety Plan and publish Site Safety Plan summary (ICS Form 208) as required.

LEGAL OFFICER

- Participate in planning meetings, if requested.
- Advise on legal issues relating to in-situ burning, use of dispersants, and other alternative response technologies.
- Advise on legal issues relating to differences between Natural Resource Damage Assessment Restoration (NRDAR) and response activities.
- Advise on legal issues relating to investigations.
- Advise on legal issues relating to finance and claims.
- Advise on legal issues relating to response.

OPERATIONS



OPERATIONS SECTION GENERAL FUNCTIONS

- Responsible for managing tactical operations at the incident site directed toward reducing the immediate hazard, saving lives and property, establishing situational control, and restoring normal operations.
- Directs and coordinates all incident tactical operations.
- Executes the Incident Action Plan.

OPERATIONS SECTION CHIEF

- Develop operations portion of Incident Action Plan.
- Brief and assign Operations Section personnel in accordance with the Incident Action Plan.
- Supervise Operations Section.
- Determine need and request additional resources.
- Review suggested list of resources to be released and initiate recommendation for release of resources.
- Assemble and disassemble strike teams assigned to the Operations Section.
- Report information about special activities, events, and occurrences to the Incident Commander.
- Respond to resource requests in support of National Resource Damage Assessment and Restoration activities.

BRANCH DIRECTOR

- Develop with subordinates alternatives for Branch control operations.
- Attend planning meetings at the request of the Operations.
- Review Assignment List (ICS Form 204-CG) for Divisions/Groups within the Branch. Modify lists based on effectiveness of current operations.
- Assign specific work tasks to Division/Group Supervisors.
- Supervise Branch operations.
- Resolve logistic problems reported by subordinates.
- Report to Operations when: the Incident Action Plan is to be modified; additional resources are needed; surplus resources are available; or hazardous situations or significant events occur.
- Approve accident and medical reports originating within the Branch.

DIVISION/GROUP SUPERVISOR

- Implement Incident Action Plan for Division/Group.
- Provide the Incident Action Plan to Strike Team Leaders, when available.
- Identify increments assigned to the Division/Group.
- Review Division/Group assignments and incident activities with subordinates and assign tasks.
- Ensure that the Incident Commander and/or Resources Unit is advised of all changes in the status of resources assigned to the Division/Group.
- Coordinate activities with adjacent Division/Group.
- Determine need for assistance on assigned tasks.
- Submit situation and resources status information to the Branch Director or the Operations.
- Report hazardous situations, special occurrences, or significant events (e.g., accidents, sickness, discovery of unanticipated sensitive resources) to the immediate supervisor.
- Ensure that assigned personnel and equipment get to and from assignments in a timely and orderly manner.
- Resolve logistics problems within the Division/Group.
- Participate in the development of Branch plans for the next operational period.

STAGING AREA MANAGER

- Establish Staging Area layout.
- Determine any support needs for equipment, feeding, sanitation and security.
- Establish check-in function as appropriate.
- Post areas for identification and traffic control.
- Request maintenance service for equipment at Staging Area as appropriate.
- Respond to request for resource assignments.
- Obtain and issue receipts for radio equipment and other supplies distributed and received at Staging Area.
- Determine required resource levels from the Operations.
- Advise the Operations when reserve levels reach minimums.
- Maintain and provide status to Resource Unit of all resources in Staging Area.
- Demobilize Staging Area in accordance with the Incident Demobilization Plan.

AIR OPERATIONS BRANCH DIRECTOR

- Organize preliminary air operations.
- Request declaration (or cancellation) of restricted air space
- Participate in preparation of the Incident Action Plan through the Operations. Insure that the air operations portion of the Incident Action Plan takes into consideration the Air Traffic Control requirements of assigned aircraft.
- Perform operational planning for air operations.
- Prepare and provide Air Operations Summary (ICS Form 220) to the Air Support Group and Fixed-Wing Bases.
- Determine coordination procedures for use by air organization with ground Branches, Divisions, or Groups.
- Coordinate with appropriate Operations Section personnel.
- Supervise all air operations activities associated with the incident.
- Evaluate helibase locations.
- Establish procedures for emergency reassignment of aircraft.
- Schedule approved flights of non-incident aircraft in the restricted air space area.
- Coordinate with the Operations Coordination Center (OCC) through normal channels on incident air operations activities.
- Inform the Air Tactical Group Supervisor of the air traffic situation external to the incident.
- Consider requests for non-tactical use of incident aircraft.
- Resolve conflicts concerning non-incident aircraft.
- Coordinate with Federal Aviation Administration.
- Update air operations plans.
- Report to the Operations on air operations activities.
- Report special incidents/accidents.
- Arrange for an accident investigation team when warranted.

PLANNING



PLANNING SECTION GENERAL FUNCTIONS

- Responsible for gathering, evaluating, and disseminating tactical information and intelligence critical to the incident.
- Maintaining incident documentation and providing documentation services.
- Preparing and documenting Incident Action Plans.
- Conducting long-range and/or contingency planning.
- Developing alternative strategies.
- Tracking resources assigned to the incident.
- Developing plans for waste disposal.
- Developing plans for demobilization.

PLANNING SECTION CHIEF

- Collect and process situation information about the incident.
- Supervise preparation of the Incident Action Plan.
- Provide input to the Incident Commander and the Operations in preparing the Incident Action Plan.
- Chair planning meetings and participate in other meetings as required. (Refer to Figure 3.2, The Operational Planning "P" for assistance).
- Reassign out-of-service personnel already on-site to Incident Commander System organizational positions as appropriate.
- Establish information requirements and reporting schedules for Planning Section Units (e.g., Resources, Situation Units).
- Determine the need for any specialized resources in support of the incident.
- If requested, assemble and disassemble Strike Teams and Task Forces not assigned to Operations.
- Establish special information collection activities as necessary (e.g., weather, environmental, toxics, etc.).
- Assemble information on alternative strategies.
- Provide periodic predictions on incident potential.
- Report any significant changes in incident status.
- Compile and display incident status information.
- Oversee preparation and implementation of the Incident Demobilization Plan.
- Incorporate plans (e.g., Traffic, Medical, Communications, Site Safety) into the Incident Action Plan.

RESOURCES UNIT LEADER

- Establish the check-in function at incident locations.
- Prepare Organization Assignment List (ICS Form 203-CG) and Incident Organization (ICS Form 207-CG).
- Prepare appropriate parts of Assignment List (ICS Form 204).
- Prepare and maintain the Incident Command Post display (to include organization chart and resource allocation and deployment).
- Maintain and post the current status and location of all resources.
- Maintain master roster of all resources checked in at the incident.

SITUATION UNIT LEADER

- Begin collection and analysis of incident data as soon as possible.
- Prepare, post, or disseminate resource and situation status information as required, including special requests.
- Prepare periodic predictions or as requested by the Planning Section Chief.
- Prepare the Incident Status Summary (ICS Form 209-CG).
- Provide photographic services and maps if required.

DOCUMENTATION UNIT LEADER

- Set up work area; begin organization of incident files.
- Establish duplication service; respond to requests.
- File all official forms and reports.
- Review records for accuracy and completeness; inform appropriate units of errors or omissions.
- Provide incident documentation as requested.
- Store files for post-incident use.

DEMOBILIZATION UNIT LEADER

- Participate in planning meetings as required.
- Review incident resource records to determine the likely size and extent of demobilization effort.
- Based on the above analysis, add additional personnel, workspace, and supplies as needed.
- Coordinate demobilization with Agency Representatives.
- Monitor the on-going Operations Section resource needs.
- Identify surplus resources and probable release time.
- Develop incident check-out function for all units.
- Evaluate logistics and transportation capabilities to support demobilization.
- Establish communications with off-incident facilities, as necessary.
- Develop an Incident Demobilization Plan detailing specific responsibilities and release priorities and procedures.
- Prepare appropriate directories (e.g., maps, instructions, etc.) for inclusion in the demobilization plan.
- Distribute demobilization plan (on and off-site).
- Provide status reports to appropriate requestors.
- Ensure that all Sections/Units understand their specific demobilization responsibilities.
- Supervise execution of the Incident Demobilization Plan.
- Brief the Planning Section Chief on demobilization progress.

ENVIRONMENTAL UNIT LEADER

- Participate in Planning Section meetings.
- Identify sensitive areas and recommend response priorities.
- Following consultation with natural resource trustees, provide input on wildlife protection strategies (e.g., removing oiled carcasses, pre-emptive capture, hazing, and/or capture and treatment).
- Determine the extent, fate and effects of contamination.
- Acquire, distribute and provide analysis of weather forecasts.
- Monitor the environmental consequences of cleanup actions.
- Develop shoreline cleanup and assessment plans. Identify the need for, and prepare any special advisories or orders.
- Identify the need for, and obtain, permits, consultations, and other authorizations including Endangered Species Act (ESA) provisions.
- Following consultation with the Federal On-Scene Commander's Historical/Cultural Resources Technical Specialist identify and develop plans for protection of affected historical/cultural resources.
- Evaluate the opportunities to use various response technologies.
- Develop disposal plans.
- Develop a plan for collecting, transporting, and analyzing samples.
LOGISTICS



LOGISTICS SECTION GENERAL FUNCTIONS

- Responsible for all support requirements needed to facilitate effective and efficient incident management, including ordering resources from off-incident locations.
- Ordering, obtaining, maintaining, and accounting for essential personnel, equipment, and supplies.
- Providing communication planning and resources.
- Setting up food services.
- Setting up and maintaining incident facilities.
- Providing support transportation.
- Providing medical services to incident personnel.

LOGISTICS SECTION CHIEF

- Plan the organization of the Logistics Section.
- Assign work locations and preliminary work tasks to Section personnel.
- Notify the Resources Unit of the Logistics Section units activated including names and locations of assigned personnel.
- Assemble and brief Branch Directors and Unit Leaders.
- Participate in preparation of the Incident Action Plan.
- Identify service and support requirements for planned and expected operations.
- Provide input to and review the Communications Plan, Medical Plan and Traffic Plan.
- Coordinate and process requests for additional resources.
- Review the Incident Action Plan and estimate Section needs for the next operational period.
- Advise on current service and support capabilities.
- Prepare service and support elements of the Incident Action Plan.
- Estimate future service and support requirements.
- Receive Incident Demobilization Plan from Planning Section.
- Recommend release of Unit resources in conformity with Incident Demobilization Plan.
- Ensure the general welfare and safety of Logistics Section personnel.

SERVICE BRANCH DIRECTOR

- Determine the level of service required to support operations.
- Confirm dispatch of Branch personnel.
- Participate in planning meetings of Logistics Section personnel.
- Review the Incident Action Plan.
- Organize and prepare assignments for Service Branch personnel.
- Coordinate activities of Branch Units.
- Inform the Logistic Section Chief of Branch activities.
- Resolve Service Branch problems.

COMMUNICATIONS UNIT LEADER

- Prepare and implement the Incident Radio Communications Plan (ICS Form 205-CG).
- Ensure the Incident Communications Center and the Message Center is established.
- Establish appropriate communications distribution/maintenance locations within the Base/Camp(s).
- Ensure communications systems are installed and tested.
- Ensure an equipment accountability system is established.
- Ensure personal portable radio equipment from cache is distributed per Incident Radio Communications Plan.
- Provide technical information as required on:
 - Adequacy of communications systems currently in operation.
 - Geographic limitation on communications systems.
 - Equipment capabilities/limitations.
 - Amount and types of equipment available.
 - Anticipated problems in the use of communications equipment.
- Supervise Communications Unit activities.
- Maintain records on all communications equipment as appropriate.
- Ensure equipment is tested and repaired.
- Recover equipment from Units being demobilized.

MEDICAL UNIT LEADER

- Participate in Logistics Section/Service Branch planning activities.
- Prepare the Medical Plan (ICS Form 206-CG).
- Prepare procedures for major medical emergency.
- Declare major emergency as appropriate.
- Respond to requests for medical aid, medical transportation, and medical supplies.
- Prepare and submit necessary documentation.

FOOD UNIT LEADER

- Determine food and water requirements.
- Determine the method of feeding to best fit each facility or situation.
- Obtain necessary equipment and supplies and establish cooking facilities.
- Ensure that well-balanced menus are provided.
- Order sufficient food and potable water from the Supply Unit.
- Maintain an inventory of food and water.
- Maintain food service areas, ensuring that all appropriate health and safety measures are being followed.
- Supervise caterers, cooks, and other Food Unit personnel as appropriate.

SUPPORT BRANCH DIRECTOR

- Determine initial support operations in coordination with the Logistic Section Chief and Service Branch Director.
- Prepare initial organization and assignments for support operations.
- Assemble and brief Support Branch personnel.
- Determine if assigned Branch resources are sufficient.
- Maintain surveillance of assigned units work progress and inform the Logistic Section Chief of their activities.
- Resolve problems associated with requests from the Operations Section.

SUPPLY UNIT LEADER

- Participate in Logistics Section/Support Branch planning activities.
- Determine the type and amount of supplies en route.
- Review the Incident Action Plan for information on operations of the Supply Unit.
- Develop and implement safety and security requirements.
- Order, receive, distribute, and store supplies and equipment.
- Receive and respond to requests for personnel, supplies, and equipment.
- Maintain an inventory of supplies and equipment.
- Service reusable equipment.
- Submit reports to the Support Branch Director.

FACILITY UNIT LEADER

- Review the Incident Action Plan.
- Participate in Logistics Section/Support Branch planning activities.
- Determine requirements for each facility, including the Incident Command Post.
- Prepare layouts of incident facilities.
- Notify Unit Leaders of facility layout.
- Activate incident facilities.
- Provide Base and Camp Managers and personnel to operate facilities.
- Provide sleeping facilities.
- Provide security services.
- Provide facility maintenance services (e.g., sanitation, lighting, clean up).
- Demobilize Base and Camp facilities.
- Maintain facility records.

GROUND SUPPORT UNIT LEADER

- Participate in Support Branch/Logistics Section planning activities.
- Develop and implement the Traffic Plan.
- Support out-of-service resources.
- Notify the Resources Unit of all status changes on support and transportation vehicles.
- Arrange for and activate fueling, maintenance, and repair of ground resources.
- Maintain Support Vehicle Inventory and transportation vehicles (ICS Form 218).
- Provide transportation services, In accordance with requests from the Logistic Section Chief or Support Branch Director.
- Collect information on rented equipment.
- Requisition maintenance and repair supplies (e.g., fuel, spare parts).
- Maintain incident roads.
- Submit reports to Support Branch Director as directed.

VESSEL SUPPORT UNIT LEADER

- Participate in Support Branch/Logistics Section planning activities.
- Coordinate development of the Vessel Routing Plan.
- Coordinate vessel transportation assignments with the Protection and Recovery Branch or other sources of vessel transportation.
- Coordinate water-to-land transportation with the Ground Support Unit, as necessary.
- Maintain a prioritized list of transportation requirements that need to be scheduled with the transportation source.
- Support out-of-service vessel resources, as requested.
- Arrange for fueling, dockage, maintenance and repair of vessel resources, as requested.
- Maintain inventory of support and transportation vessels.

FINANCE/ADMINISTRATION



FINANCE/ADMINISTRATION SECTION GENERAL FUNCTIONS

- Responsible for all financial and cost analysis aspects of an incident. (Note: Not all incidents will require a separate Finance/Administration Section. In cases that require only one specific function (e.g., cost analysis), this service may be provided by a member of the Planning Section.)
- Administering any contract negotiation.
- Providing cost analysis as it pertains to the Incident Action Plan.
- Maintaining cost associated with the incident.
- Tracking personnel and equipment time.
- Addressing compensation for injury or damage to property issues.

FINANCE/ADMINISTRATION SECTION CHIEF

- Attend planning meetings as required.
- Manage all financial aspects of an incident.
- Provide financial and cost analysis information as requested.
- Gather pertinent information from briefings with responsible agencies.
- Develop an operating plan for the Finance/Administration Section; fill supply and support needs.
- Determine the need to set up and operate an incident commissary.
- Meet with assisting and cooperating agency representatives, as needed.
- Maintain daily contact with agency(s) administrative headquarters on Finance/ Administration matters.
- Ensure that all personnel time records are accurately completed and transmitted, according to policy.
- Provide financial input to demobilization planning.
- Ensure that all obligation documents initiated at the incident are properly prepared and completed.
- Brief administrative personnel on all incident-related financial issues needing attention or follow-up prior to leaving incident.

TIME UNIT LEADER

- Determine incident requirements for time recording function.
- Determine resource needs.
- Contact appropriate agency personnel/representatives.
- Ensure that daily personnel time recording documents are prepared and in compliance with policy.
- Establish time unit objectives.
- Maintain separate logs for overtime hours.
- Establish commissary operation on larger or long-term incidents as needed.
- Submit cost estimate data forms to the Cost Unit, as required.
- Maintain records security.
- Ensure that all records are current and complete prior to demobilization.
- Release time reports from assisting agency personnel to the respective Agency Representatives prior to demobilization.
- Brief the Finance/Administration Section Chief on current problems and recommendations, outstanding issues, and follow-up requirements.

PROCUREMENT UNIT LEADER

- Review incident needs and any special procedures with Unit Leaders, as needed.
- Coordinate with local jurisdiction on plans and supply sources.
- Obtain the Incident Procurement Plan.
- Prepare and authorize contracts and land-use agreements.
- Draft memoranda of understanding as necessary.
- Establish contracts and agreements with supply vendors.
- Provide for coordination between the Ordering Manager, agency dispatch, and all other procurement organizations supporting the incident.
- Ensure that a system is in place that meets agency property management requirements. Ensure proper accounting for all new property.
- Interpret contracts and agreements; resolve disputes within delegated authority.
- Coordinate with the Compensation/Claims Unit for processing claims.
- Coordinate use of impress funds, as required.
- Complete final processing of contracts and send documents for payment.
- Coordinate cost data in contracts with the Cost Unit Leader.
- Brief the Finance/Administration Section Chief on current problems and recommendations, outstanding issues, and follow-up requirements.

COMPENSATION/CLAIMS UNIT LEADER

- Establish contact with the incident Security Officer and Liaison Officer (or Agency Representatives if no Liaison Officer is assigned).
- Determine the need for Compensation for Injury and Claims Specialists and order personnel as needed.
- Establish a Compensation for Injury work area within or as close as possible to the Medical Unit.
- Review Medical Plan (ICS Form 206-CG).
- Ensure that Compensation/Claims Specialists have adequate workspace and supplies.
- Review and coordinate procedures for handling claims with the Procurement Unit.
- Brief the Compensation/Claims Specialists on incident activity.
- Periodically review logs and forms produced by the Compensation/Claims Specialists to ensure that they are complete, entries are timely and accurate and that they are in compliance with agency requirements and policies.
- Ensure that all Compensation for Injury and Claims logs and forms are complete and routed appropriately for post-incident processing prior to demobilization.
- Keep the Finance/Administration Section Chief briefed on Unit status and activity.
- Demobilize unit in accordance with the Incident Demobilization Plan.

COST UNIT LEADER

- Coordinate cost reporting procedures.
- Collect and record all cost data.
- Develop incident cost summaries.
- Prepare resources-use cost estimates for the Planning Section.
- Make cost-saving recommendations to the Finance/Administration Section Chief.
- Ensure all cost documents are accurately prepared.
- Maintain cumulative incident cost records.
- Complete all records prior to demobilization.
- Provide reports to the Finance/Administration Section Chief.

FIGURE 3.2

UNITED STATES COAST GUARD Operations Period Planning

The Operational Planning "P"



SECTION 4

SPILL IMPACT CONSIDERATIONS

4.1 CRITICAL AREAS TO PROTECT

The critical areas to protect are classified as high, moderate, and low sensitivity to oil for non-coastal/inland environments. The Federal, Province/State, and Local authorities will further clarify these categories at the time of the response. The categories are defined as follows:

HIGH SENSITIVITY

- Areas which are high in productivity, abundant in many species, extremely sensitive, difficult to rehabilitate, or inhabited by threatened/endangered species.
- Areas which consist of forested areas, brush/grassy areas, wooded lake areas, freshwater marshes, wildlife sanctuaries/refuges, and vegetated river/stream banks.

MODERATE SENSITIVITY

- Areas of moderate productivity, somewhat resistant to the effects of oiling.
- Areas which consist of degraded marsh habitat, clay/silt banks with vegetated margins, and gravel/cobble beaches.

LOW SENSITIVITY

- Areas of low productivity, man-made structures, and/or high energy.
- Areas which consist of gravel, sand, or clay material, barren/rocky riverbanks and lake edges, man-made structures, and concrete/compacted earthen drainage ditches.

4.2 ENVIRONMENTAL/SOCIO-ECONOMIC SENSITIVITIES

Environmental/Socio-economic sensitivities are of extreme importance when planning a response effort. The health and safety of the public and the environment, as well as the protection of the various socio-economic sensitivities, must be promptly addressed in order to mitigate the extent of damage and minimize the cost of the clean-up effort.

It is important to protect archeological sites and heritage resources (e.g. National Parks, National Marine Conservation Areas, and National Historic Sites). Impacted archeological sites or heritage resources of an area need to be identified and the likely impacts that result from the activities should be addressed. Specific consideration should be given to access to, and general use and disturbance of areas. The assessment should consider both direct and indirect impacts, cultural protocols and strategies for minimizing impacts. Consultation with local indigenous communities should occur as part of the planning process.

The Company will explore, where appropriate, equivalent environmental protection systems, methods, devices, or technologies that maintain or may be less damaging to the character of heritage resources or archeological sites. If a release from the pipeline impacts a heritage resource, the Company will respond as outlined in Section 3.0, report to the appropriate authority prescribed by law, cleanup and restore the area as required by regulation, and conduct such sampling, analyses, or associated monitoring during and after restoration.

All environmental/socio-economic sensitivities are worthy of protection, but must be prioritized during a response effort. When making decisions on which areas to designate as collection areas and which to protect, the following sources may be consulted:

- Canadian Wildlife Services, U.S. Fish and Wildlife Service and related province/ state agencies
- Applicable Area Contingency Plans
- Other industry and private experts

The environmental and socio-economic sensitivities in the vicinity of the Pipeline have been broken down into specific categories and identified in this Section. To further clarify the location of the sensitive areas of concern, references to published Area Contingency Plans and Environmental Sensitivity Maps are also provided in this section.

4.3 FISHERIES AND WILDLIFE PROTECTION

The Company will work with Federal, Province/State, and local agency personnel to provide labor and transportation to retrieve, clean, and rehabilitate birds and wildlife affected by an oil spill, as necessary. Oversight of the Company's wildlife preservation activities and coordination with Federal, Province/State, and Local agencies during an oil spill is the responsibility of the Incident Commander.

Protecting fish habitat (e.g. spawning and rearing grounds) is important to both consumers and commercial fisheries. Beyond typical response strategies, other options could include moving floating facilities, temporarily sinking facilities using cages designed for this purpose, temporary suspension of water intakes, or closing sluice gates to isolate the facilities from contamination.

Special consideration should be given to the protection and rehabilitation of endangered species and other wildlife and their habitat in the event of an oil spill and subsequent response. Jurisdictional authorities should be notified and worked with closely on all response/clean-up actions related to wildlife protection and rehabilitation. Laws with significant penalties are in place to ensure appropriate protection of these species.

Wildlife Rescue

The Company will work with Federal, Province/State, and Local agency personnel to provide labor and transportation to retrieve, clean, and rehabilitate wildlife affected by an oil spill, as the situation demands.

The following are items which should be considered for wildlife rescue and rehabilitation during a spill response:

Bird relocation can be accomplished using a variety of deterrents, encouraging birds to avoid areas of spilled oil. Bird relocation can be accomplished by utilizing deterrent methods including:

- Use of visual stimuli, such as inflatable bodies, owls, stationary figures, or helium balloons, etc.
- Use of auditory stimuli, such as propane cannons, recorded sounds, or shell crackers.
- Use of herding with aircraft, boats, vehicles, or people (as appropriate).Use of capture and relocation.

Search and Rescue -Points to consider

- The Company's involvement should be limited to offering assistance as needed or requested by the agencies.
- Prior to initiating any organized search and rescue plan, authorization must be obtained from the appropriate Federal/State agency.
- Initial search and rescue efforts, if needed, should be left up to the appropriate agencies.
- They have the personnel, equipment, and training to immediately begin capturing contaminated wildlife.
- With or without authorization, it must be anticipated that volunteer citizens will aid distressed/contaminated wildlife on their own. It is important to communicate that it may be illegal to handle wildlife without express authority from appropriate agencies. Provisions should be made to support an appropriate rehabilitator; however, no support should be given to any unauthorized volunteer rescue efforts.
- The regulatory agencies and response personnel should be provided the name and location of a qualified rehabilitator in the event contaminated wildlife is captured.

4.4 STAGING AREAS

When establishing personnel and equipment staging areas for a response to a Pipeline discharge, the following criteria should be evaluated:

- Access to waterborne equipment launching facilities and/or land equipment.
- Access to open space for staging/deployment of heavy equipment and personnel.
- Access to public services utilities (electricity, potable water, public phone, restroom and washroom facilities, etc.).
- Access to the environmental and socio-economically sensitive areas which are projected for impact.

4.5 CONTAINMENT AND RECOVERY OF SPILLED PRODUCT

General descriptions of various specific response techniques that may be applied during a response effort are discussed below. Company responders are free to use all or any combination of these methods as incident conditions require, provided they meet the appropriate safety standards and other requirements relative to the situation encountered. Data was obtained from reports, manuals and pamphlets prepared by the American Petroleum Institute, Environmental Protection Agency, and the United States Coast Guard. The most effective cleanup of a product spill will result from an integrated combination of clean-up methods. Each operation should complement and assist related operations and not merely transfer spillage problems to areas where they could be more difficult to handle.

The spill should be assessed as soon as possible to determine the source, extent and location of travel. Terrain and other physical conditions downgradient of the spill site will determine the methods of control at a point in advance of the moving product. Often, the bulk of a spill can be contained at a single location or a few key locations in the immediate vicinity of the source point. When possible, the execution of this type of initial containment strategy helps confine a spill to a relatively limited area.

Spill on Land (Soil Surfaces)

Containment Methods

Product can be trapped in ditches and gullies by earth dams. Where excavating machinery is available, dams can be bulldozed to contain lakes of product. Dams, small and large, should be effectively employed to protect priority areas such as inlets to drains, sewers, ducts and watercourses. These can be constructed of earth, sandbags, absorbents, planks or any other effective method. If time does not permit a large dam, many small ones can be made, each one holding a portion of the spill as it advances. The terrain will dictate the placement of the dams. If the spill is minor, natural dams or earth absorption will usually stop the product before it advances a significant distance. Cleanup is the main concern in such situations.

In situations where vapors from a spill present a clear and present danger to property or life (possible ignition because of passing automobiles, nearby houses, or work vehicles approaching the area), spraying the surface of the spill with dispersant will greatly reduce the release of additional vapors from the product. This method is especially adapted to gasoline spills on soil surfaces.

Removal Methods

The recovery and removal of free product from soil surfaces is a difficult job. The best approaches at present seem to be:

- Removal with suction equipment to tank truck if concentrated in volumes large enough to be picked up. Channels can be formed to drain pools of product into storage pits. The suction equipment can then be used.
- Small pockets may have to be dipped up by hand.
- If practicable after removal of the bulk of the spill, controlled burning presents the possibility of a fast, simple, and inexpensive method of destruction of the remainder of the product. If all other options have been executed and the site is still unsafe for further activity because explosive vapors persist, the vapors may need to be intentionally ignited to prevent an accumulation sufficient to become an explosive mixture, provided the other requirements of these guidelines for controlled burning are met.

Intentional ignition to remove released product should be utilized only if all of the following conditions are met:

- Other steps and procedures have been executed and a determination has been made that this is the safest remaining method of control.
- Intentional burning will not unduly damage pipelines, adjacent property, or the environment.
- Controlled burning is permitted by government authorities. Local government authorities to be contacted may include city council, county board of commissioners, city or county fire chiefs, the county forestry commission or fire tower, and the local environmental protection agency. In seeking permission from these authorities, be prepared to convince them that adequate safety precautions have been and will be taken during the operation.
- Controlled burning is conducted with the consent of local land owners.
- Safety must always be a prime consideration when considering controlled burning of product. Sparks and heat radiation from large fires can start secondary fires and strong winds make fire control difficult. There must be no danger of the fire spreading beyond control limits. All persons must be at a safe distance from the edge of the inflammable area. Remember that all burning must be controlled burning.

Spill on Lake or Pond (Calm or Slow-Moving Water)

Containment Methods

A lake or pond offers the best conditions for removal of product from water. Although the removal is no easy task, the lake or pond presents the favorable conditions of low or no current and low or no waves.

The movement of product on a lake or pond is influenced mainly by wind. The product will tend to concentrate on one shore, bank or inlet. Booms should be set up immediately to hold the product in the confined area in the event of a change in wind direction.

If the spill does not concentrate itself on or near a shore (no wind effect), then a sweeping action using boats and floating booms will be necessary.

The essential requirement for this operation is that it be done very slowly. The booms should be moved at not more than 40 feet per minute. Once the slick is moved to a more convenient location (near shore), the normal operations of removal should begin.

If the slick is small and thin (rainbow effect) and not near the shoreline, an absorbent boom instead of a regular boom should be used to sweep the area very slowly and absorb the slick. The product may not have to be moved to the shoreline. See Figure 4.1 for on-water recovery decision tree.

Removal Methods

If the Containment slick is thick enough, regular suction equipment may be used first; however, in most instances, a floating skimmer should be used.

If the floating skimmer starts picking up excess water (slick becomes thin), drawing the boom closer to the bank as product is removed will also keep film of product thicker.

However, when the slick becomes too thin, the skimmer should be stopped and an absorbent applied (with a boat if necessary) to remove the final amounts. The floating skimmer (if speed is a must) or hand skimmers (if water is shallow enough) or both can be used to pick up the product-soaked absorbent. Before pumping the product-soaked absorbent with a floating skimmer, ensure that the absorbent in question can be pumped and will not harm the pump. Several types are nonabrasive to pump internals. If the floating skimmer is used first, the product-soaked absorbent/water mixture should be pumped into a tank truck.

A better method of retrieving the product-soaked absorbent is to draw it in as close to the shore as possible with the booms used to confine the product initially. The absorbent can then be hand skimmed from the water surface and placed in drums, on plastic sheets or in lined roll-off boxes. It should then be disposed of by acceptable means.

The final rainbow on the surface can be removed with additions of more absorbent.

Spill on Small to Medium Size Streams (Fast-Flowing Creeks)

Containment Methods

The techniques used for product containment on fast-flowing shallow streams are quite different from the ones used on lakes, ponds, or other still bodies of water. The containment and removal processes require 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 should be created by damming. The dam can be constructed by using sandbags, planks or earth. If a dam is required, it should be situated at an accessible point where the stream has high enough banks. The dam should be constructed soundly and reinforced to support the product and water pressure.

- Underflow dam -The underflow dam is one method that can be used, especially on small creeks. The water is released at the bottom, of the dam using a pipe or pipes which are laid during construction of the dam. The flow rate through the pipe must be sufficient to keep the dam from overflowing. One method is to lay the pipe at an angle through the dam (while dam is being constructed) so that the height of the downstream end of the pipe will determine the height the water will rise behind the dam.
- Overflow dam -Another method of containment is the overflow type dam. The dam is constructed so that water flows over the dam, but a deep pool is created which slows the surface velocity of the water. Therefore, the condition of a calm stretch of water is met. The overflow dam may be used where larger flow rates (medium size creeks) of water are involved

With this type dam, a separate barrier (floating or stationary boom) must be placed across the pool created by the dam. The separate barrier arrests the surface layer of product. At the same time, the water is flowing under the barrier and over the top of the dam. The barrier should be placed at an angle of 45 % across the pool to decrease the effective water velocity beneath it. Also, it helps to concentrate the product at the bank and not all along the barrier. A second barrier should be placed approximately 10 to 15 feet downstream of the first one as a secondary back-up.

The stationary boom type barrier should be made of wood planks or other suitable material. The stationary boom should be soundly constructed and sealed against the bank. The ends of the planks can be buried in the banks of the stream and timber stakes driven into the stream bed for support as needed. The necessary length of the boom will be approximately 1-1/2 times the width of the waterway.

The plank boom should extend six to eight inches deep into the water and about two inches or higher above the water level. If the increase in velocity under the stationary boom is causing release of trapped product, it should be moved upward slightly. At no time should barrier be immersed more than 20% of the depth of the pool at the barrier location; that is, if the pool created by damming is three feet deep, do not exceed an immersion depth of seven inches with the barrier at the position the barrier is installed.

Another method used with the underflow dam is having the pipe or pipes sized to carry only a portion of the flow needed. The pipe would be placed at the bottom of the dam and level with the creek bed. The remaining flow of the creek could be siphoned or preferably pumped around the dam from a point away from the dam and from the deepest portion of the pool. The pumping or siphoning can be controlled to maintain the desired water level at the dam. The key is the removal of water through or around the dam at the lowest point in the basin. This prevents the oil from escaping with the released water.

A floating boom can be used in place of the stationary type if the created pool's size (bank to bank) and depth will permit. Since changing the depth and/or length of a standard floating boom in a small stream is difficult, the use of the separation of product and water. The advantages of using a floating boom are the speed of deployment and the fact that there is no need for additional support as with the stationary boom.

 Multiple Impoundments -Since emergency built dams (either underflow or overflow) are seldom perfect, a series of dams is usually required. The first one or two will trap the bulk and the ones that are downstream will trap the last traces of product. Precautions should be taken to ensure that the foundations of emergency dams are not washed away by the released water. If earth is used to construct an overflow dam, a layer of earth-filled bags should be placed on top of the dam so erosion will not take place. See Figure 4.1 for on-water recovery decision tree.

Removal Methods

Once the containment dams are constructed, the problem or removal of the product from the water surface should be the prime consideration. The removal must be continuous or else build-up of product behind the dams or booms might lead to product escaping the traps.

The type of removal procedures used depends largely on the amount of product being trapped in a given span of time, if the amount of product moving down the stream is of sufficient quantity, the first dam or fixed boom would quite possibly trap enough for the floating skimmer to work efficiently. The skimmer will pump the product and possibly some water to a tank truck or other holding tank. Separated water may be released from the bottom of the tank truck if it becomes necessary. The absorbents could then be used at downstream dams or booms. It is inadvisable to place an absorbent in the stream prior to or at the first dam in anticipation of the arriving product. Let the product accumulate at the first dam and use the floating skimmer to recover the product.

Disposal of gross amount of product-soaked absorbent would not then be a problem. Follow directions on use of each absorbent. Some are designed to be placed on water before product arrives; others are intended only to be placed on the product after it accumulates on the water. Plastic sheets should be used to place the product-soaked absorbent on as it is hand skimmed from the water. Alternatively, the material may be placed in drums or lined roll-off boxes.

The containment and removal of spilled product on small to medium fast-flowing streams might require a combination of underflow or overflow dams, fixed booms, skimmers, and absorbents, to ensure a complete cleanup.

Spill on Large Streams and Rivers

Containment Methods

The containment techniques differ considerably on large streams and rivers versus small streams. First, the smooth calm area of water necessary for product-water separation must be found along the stream or river rather than making one as with small streams. Floating booms (rather than fixed booms or dams) must be used to trap the surfaced product.

Local conditions of current and wind must be considered when selecting the site for the boom. A point with a low water velocity near the bank, sufficient depth to operate the product removal equipment, and good access are required. The fact that wind may tend to concentrate the product against one bank must be considered. A smooth, undisturbed area of water is required immediately upstream of the boom to ensure that the product has opportunity to separate out onto the surface. The boom should be positioned where the current is at a minimum. It is more effective to boom at a wide, slow position than on a narrow, fast stretch of water.

If the boom are positioned straight across a river or stream, at right angles to the flow, surface water tends to dive beneath the barrier (boom) when current velocities exceed about ½ knot (0.8 ft./sec.). However, if the current of the entire river is ½ knot or less, then a boom can be positioned straight across the river or large stream, but angled slightly in relation of the banks. By placing the boom at an angle to the banks, product on the surface is diverted along the boom to the side of the river.

The current velocity is usually much slower near the river bank than in the center and the product will move along the boom toward the bank for removal. A water-tight seal between the bank and the boom is essential. A secondary boom should be set up immediately downstream of the first one to capture the amounts that escape the upstream boom. A boom can be employed parallel to the river flow at the bank to form the seal with the booms used to trap the product.

Where the current velocity of the chosen site exceeds ½ knot, the boom should be positioned in two smooth curves from a point of maximum velocity (usually the center of the river) to both banks. However, this double-boom required product to be removed from both sides of the river. To determine the appropriate angle of boom placement and support (mooring) needed to hold the booms in position, the current velocity should be measured by timing a floating object which is 80% submerged over a distance of 100 feet. A time of 60 seconds over this distance indicates a water current of approximately 1 knot.

For currents from 1 to 2.5 knots (1.7 to 4.2 ft./sec.), the more the boom will have to be angled acute to the bank. The length of the boom will have to be such to reach the center of the river. For currents between $\frac{1}{2}$ and 1 knot (0.8 and 1.7 ft./sec.), the angle of employment can be enlarged.

The major load on the boom is taken by the terminal moorings, particularly the one in the center of the river. However, intermediate moorings are also required both to maintain the smooth curve of the boom to prevent breaking of the boom and to assist with preventing skirt deflection. The intermediate moorings are preferably positioned every 25 feet and must be adjusted to avoid the formation of indentations in the boom profile. These trap product in pockets, prevent its deflection to the bank, and also encourage diving currents. The mooring ropes should be five times the water depth.

In certain situations, it might be advantageous to position booms to deflect the approaching spilled product to a slower moving area. Naturally, additional booms would have to be positioned around this slower moving area prior to deflecting the product to the area. This approach has been used along river which has lagoons, etc., with a very low current action. The recovery would take place in the lagoons and not along the river bank. See Figure 4.1 for on-water recovery decision tree.

Removal Methods

The product collected upstream of the floating booms in a large stream or river should be removed from the water surface as it accumulates. Regular suction equipment, a floating skimmer, and/or absorbents (including absorbent booms) should be used to remove the product as appropriate to the quantity being trapped in a given span of time. If the amount moving down the stream is of sufficient quantity, the primary floating boom would possibly trap enough for the floating skimmer to work efficiently. The skimmer will pump the product and some water to a tank truck or other holding tank.

The absorbents would then be used upstream of the secondary boom to absorb the underflow from the primary boom. An absorbent boom can also be placed between the primary and secondary booms to help the other absorbents control the underflow from the primary boom.

It is best to hand skim the saturated absorbents and place on plastic sheets. However, if the absorbent used can be pumped after product absorption and speed of removal is a necessity, the floating skimmer can be used to remove the product-soaked absorbent.

The disadvantage of pumping the product-soaked absorbent to a truck is the volume that will accumulate (skimmer will pump excess water) and the disposal problems associated with the large water/product-soaked absorbent mixture.

Spill on Stream which Flows into Lake or Pond

In certain locations where streams (small and large ones) flow into lakes or ponds at relatively short distances, it is conceivable that a spill could reach the lake before containment and recovery operations are set up. If time permits for containment operations to be set up on the stream in question, it then would be handled as described above depending upon the stream size involved.

However, if product in the stream is near the lake site or if product is flowing into the lake with a significant amount yet to arrive, a different containment should be employed.

Containment Methods

Product on a stream flowing into a lake should be boomed as close to the entrance as possible. The boom should be positioned on the lake at an angle to the residential stream current so as to direct the surface water to a slower moving area. The area where the product is being deflected should be enclosed by booms to contain it. An additional boom for sweeping the product to the bank will be required. This area of containment should not have a current velocity of more than 1/2 knot (0.8 ft./sec.), preferably less. See Figure 4.1 for on-water recovery decision tree.

Removal Methods

The removal of product from the lake or pond's surface would be handled as described earlier.

For sizable releases, collected product will usually be pumped into tank trucks and transported to a storage facility. Tank trucks are available at several locations throughout.

Spill in Urban Areas

Oil spills in urban areas can greatly impact recreational use, human health, wildlife habitat(s), and potential beach or park closures. Manmade structures along waterways require unique protection strategies. Manmade structures could include vertical shore protection structures such as seawalls, piers, and bulkheads, as well as riprap revetments and groins, breakwaters, and jetties. Vertical structures can be constructed of concrete, wood, and corrugated metal. They usually extend below the water surface, although seawalls can have beaches or riprap in front of them. These structures are very common along developed shores, particularly in harbors, marinas, and residential areas. The range in degree of exposure to waves and currents varies widely, from very low in dead-end canals, to very high on offshore breakwaters. Boat wakes can generate wave energy in otherwise sheltered areas. Maintaining shipping or other kinds of vessel traffic through navigation channels or waterways during a spill response is a difficult consideration because there is usually economic and political pressure to re-establish normal operations as soon as possible. This consideration extends to vehicular traffic through urban areas. Deploying booms and skimmers or constructing recovery sites can conflict with such traffic for several days. Also, passage of deep-draft vessels through the waterway can suddenly change water level and flow or create wakes. causing booms to fail. For these reasons, recovery efforts must be coordinated through the Unified Command to ensure the cooperation of all parties involved.

Containment Methods

Containment techniques in an urban area depend greatly on the ability to deploy equipment due to obstacles presented by the urban area. Most booming and containment techniques will work with slight modifications such as direct anchoring instead of the use of booming buoys. Often, debris and other obstacles cause gaps in containment or clog up the flow of oil in diversion booming. Vessel traffic can also cause containment to fail, due to splash over from vessel wakes.

Removal Methods

Normal recovery techniques work when recovering oil in an urban area. However, recovery can be hampered by several situations. Floating debris clogging skimming equipment is the main cause for low recovery rates. Another problem for recovery in an urban area is lack of storage space. Often traffic problems or lack of access prevent storage equipment such as frac tanks and vacuum trucks from approaching the recovery zone.

Spill Under Ice

Containment Methods

The traditional strategy for dealing with oil under the ice in a river or lake is to cut a slot to aid in recovery. Ice slots can be cut using chain saws, handsaws, ice augers or some form of trencher. Another effective variation of this technique is the diversionary plywood barrier method which is also discussed below. See Figure 4.1 for on-water decision tree.

Removal Methods

Ice slotting is a very basic technique used to gain access to oil trapped beneath the ice. In ice slotting, a J shaped outline is sketched into the ice at a 30 degree angle to the current. The slight J hook or curve is necessary at the upstream side to provide flow towards the recovery area. In general, the slot width should be 1.5 times the thickness of the ice. Remember, a block of ice is heavy and the width of the slot must be taken into consideration so it can be safely removed or pushed under if the water beneath the ice is sufficiently deep. The length of the slot will be determined by the width of the river and strategy.

This technique is a successful strategy to implement. However, there are a few pit falls to be aware off. First, responders will fatigue rapidly if required to cut the slot or slots by hand using a chain saw or hand held saw. This can present a problem if there are not a sufficient number of Hazmat technicians available. Secondly, when cutting with chain saws, large volumes of water are kicked up by the moving chain onto the responder. This is a safety problem when the responders get wet in extreme cold weather conditions. Wearing rain gear however can reduce this problem.

A second technique is to slot the ice and use plywood to help divert oil beneath the ice to a recovery area. This technique is called the diversionary plywood barrier method. In this technique, a narrow slot is made through the ice and 4' \times 8' sheets of plywood or equivalent are dropped into the slot to create a barrier and force the oil to follow along it to the collection area. This is the same principal employed when using floating boom.

The slot can be cut or drilled depending on the equipment available at the time of the response. If drilling is required, a gas powered ice auger can be used. In this scenario a series of 8" or 10" holes are drilled next to each other in the J pattern.

A chain saw can be used to connect the holes if an ice bridge exists between two auger holes. After the ice auguring is complete, plywood can be dropped into the augured slot.

Again, river ice is dirty and chipper blades on the augers may only last long enough to complete a single auger hole. This technique requires a large inventory of chipper blades. Extra auger flights can be used, which reduces down time to change blades. A real plus to slotting the ice with an ice auger is the limited exposure of responders to water. The water is generally restricted to the area around the responder's feet.

If an ice auger is not available, a chain saw can be used to cut a narrow slot. After the slot has been cut and ice removed, plywood can be inserted. When using a chainsaw that makes a 3/8" cut, a 1/8"-1/4" plywood or outdoor siding can be inserted into the slot and effectively be used to create the barrier. Again, the down side when using a large chain saws is fatigue and splash from water being kicked up by the chain. However, this problem is not as bad as cutting large slots as described above. Since only a single slot is made, the number of responders can be reduced and extra personal protective equipment in the form of rain gear can be used to minimize the water splash.

Spill on Ice

When managing an oil spill on ice special consideration must be given to several safety factors. Thickness of the ice and general accessibility of equipment must be considered when planning for on-ice recovery. Ice that is too thin to safely traverse or broken ice may prevent active recovery.

Containment Methods

For ice-covered on-land or on-water spills, snow or earthen berms may be constructed to contain oil around the leak, if terrain permits. Dikes filled with sorbent materials may be used on spills in smaller streams to create a manmade dam to prevent the further migration of the oil.

Oil may become encapsulated due to melting and refreezing of the ice. Oil may then be more difficult to access and remove. See Figure 4.1 for on-water recovery decision tree.

Removal Methods

Generally, on-ice recovery consists of the manual removal of the product from the spill site. If conditions permit, vacuum trucks or suction pumps may be used to remove pools of oil that may have collected. Often, product removal will be done by hand using brooms, shovels and rakes. Manually moving the oil/snow mixture into piles for collection where it is either vacuum or manually collected into storage containers.

Spill in Wetland Areas

Wetlands, which include upland and inland marshes, swamps and bogs, are highly sensitive to spills because they collect run-off from surrounding environments, and because they are home to many commercially and ecologically important species. Wetlands are very susceptible to damage and are a high priority to protect. Precautions should be taken so that the recovery effort does not cause more damage than that cause by the release.

Containment Methods

Containment booms can be strategically deployed to contain or divert the product into recovery areas where skimmers and vacuums can be used to remove the product. Berms can also be built to contain or divert the product. Consideration must be given to the damage that can be caused by holding the product in the wetland areas. Often, allowing the product to flow to natural collection areas and possibly assisting the flow by the use of high volume low pressure water pumps may be the best course of action.

Removal Methods

Skimmers and vacuums can be deployed to recover contained oil. Other acceptable response techniques might include bioremediation, sorbents and in-situ burning. The use of heavy equipment is often not practical because of the damage it can cause to plant and animal life. During recovery, specially designed flat bottom shallow draft vessels and the use of plywood or boards may be used to reduce the damage caused by recovery personnel. If the water table is high and the oil will not permeate the soil, shallow trenches may be dug to collect oil for removal.

The Unified Command must balance the need to remove the product with the damage caused by active removal. Considerations for long term passive recovery should be considered.



FIGURE 4.1 ON WATER RESPONSE FLOWCHART

4.6 VULNERABILITY ANALYSIS

A thorough examination of published Area Contingency Plans (ACPs) was conducted to identify sensitive areas in all the response zones.

The Environmental Sensitivity Maps will be created using this data.

4.7 ALTERNATIVE RESPONSE STRATEGIES

There are no pre-approved response options for inland spills within the United States. Any plans to use dispersants or in situ burn by the Company will be submitted to the Federal On-Scene Coordinator for Regional Response Team approval prior to such action being taken.

IN SITU BURNING

When considering the use of in situ burning the following considerations should be evaluated. In most cases, an agency application with further considerations will need to be completed before burning will be approved by the agency.

Size, Nature, and Product Spilled

- Flammability of the product. (Will the product burn?)
- Location of spill. (Distance and direction to nearest human use areas.)
- Volume of product released.
- Estimate of the surface area covered by the spill.
- How long has oil been exposed?
- Will burning cause more hazardous by-products?

Weather and Forecast

- Current weather conditions. (Rain / Heat)
- Wind speed and direction.
- 24 hour forecast.
- 48 hour forecast.

Evaluate the Response Operations

- Is there time enough to conduct burning?
- Is safety equipment available?
- Is adequate personnel available for monitoring / emergency response?
- Is mechanical recovery more intrusive than burning?

Habitats Impacted and Resources at Risk

- Have local agency / Officials been contacted.
 - Public Health
 - Land Owner / Manager
 - Local Fire Management (Fire Marshall)
 - Historic Property Specialist
 - Province / State Resource Agency
 - Aboriginal / Native American interests
- What is / will be the impact to surface water intakes and wells.
- Are endangered habitats / endangered species present?
- Is area used by Migratory Animals?
- What wildlife is present?

Burn Plan

- How much of the oil is expected to burn?
- How long will it be expected to burn?
- How will burn be ignited?
- How will burn be extinguished?
- How will burned oil residue be collected?
- What are the monitoring protocols?

DISPERSANT USE

Dispersants are not commonly used on inland spills. Working closely with Federal, Province / State and local agencies will be necessary for gaining approval to use dispersants. Since dispersants do not eliminate the oil, only break up and spread the oil throughout the water column, it is important to look at the total effect the oil will have on the environment while considering the use of dispersants.

APPENDIX A

RESPONSE EQUIPMENT/RESOURCES

A.1 COMPANY OWNED RESPONSE EQUIPMENT

The Company owns and operates oil spill response equipment contained within response trailers staged throughout the pipeline system. This equipment is maintained according to manufacturer's recommendations by Company and/or contracted personnel. An equipment summary detailing locations, type and amount stored in the response trailers is listed in Figure A.1. The Company also has contracts in place with Oil Spill Removal Organizations and other clean-up contractors that are capable of responding to all discharges along the Pipeline. Figure A.2 lists the contracted Oil Spill Removal Organizations.

20' boom trailers are located at the Hardisty Pump Station (Alberta), Regina Pump Station (Saskatchewan), in Valley City (North Dakota) at an external contractor site, and in Brookings (South Dakota) at a TransCanada office location.

The Qualified Individual has the authority to activate other private contractors, experts, and consultants as the situation demands.

All Pipeline personnel who might be involved in an oil spill have been informed that detergents or other surfactants are prohibited from being used on an oil spill in the water and that dispersants can only be used with the approval of the Canadian Regional Environmental Emergency Team (REET) or US Regional Response Team, the interagency group composed of Federal and State agency representatives that coordinates oil spill response.

A.2 OTHER COMPANY RESOURCES

Additional Company spill response equipment and manpower resources are not available to supplement the response operation; however, third party contractors will be activated on an as needed basis.

A.3 CONTRACT RESOURCES

The resources will be secured from a Company approved contractor. Management will typically handle notification/implementation of these resources. Figure A.2 provides a quick reference to the Oil Spill Removal Organizations and details their response capability and estimated response times. Telephone reference is provided in Figure 1.5. (Note: The <u>Company</u> will ensure that each OSRO has a comprehensive maintenance program and applicable training / drills programs in place at contract renewal.)

A.4 COOPERATIVE/MUTUAL AID RESOURCES

The Company is a member of the following Oil Spill Cooperatives or mutual aid groups:

- Western Canadian Spill Services Ltd.
- Alberta Area U and S Oil Spill Cooperatives
- Saskatchewan Area 3, 6, and 4 & 5 Oil Spill Cooperatives

A.5 VOLUNTEERS

Volunteers will not be utilized by the Company for the response operations. In the U.S., all volunteers will be referred to the Federal Regional Response Team.

A.6 COMMUNICATIONS

Effective and efficient communications systems are essential for emergency response at every level. The communications system will be utilized to gather information and current status reports as well as to provide coordination and direction to widely separated work groups involved in search, containment/diversion, repair, traffic control, public control or evacuation, and restoration.

The Company's overall Emergency Notification Chart (Figure 1.2) indicates individuals within the Company and governmental agencies (Figure 1.5) who must be contacted in the event of an emergency.

Notification information for the Qualified Individuals, Alternate Qualified Individuals, emergency response contractors, and governmental agencies is located in Section 1.0 and the Response Zone Annexes.

Lines of communication between the Incident Commander, local personnel, and contractors are demonstrated in the organization charts provided in Figures 3.1 and 3.2. Communication of the overall spill response operation between the Company and the responsible government agencies will occur between the Incident Commander and the Federal On-Scene Coordinator.

Central Communications System

Prearranged communication channels are of the utmost importance in dealing with Company emergencies. The notification procedures and telephone contacts documented in Section 1.0 will be reviewed in accordance with the earlier documented updating procedures. The predetermined communications channels include the following:

- A list of emergency telephone numbers for internal management and emergency response personnel (Figures 1.2 and 1.5).
- A list of emergency telephone numbers for various external resources such as the Fire Departments, Public Officials and local agencies is provided in the Annexes.
- A list of emergency telephone numbers for contract response resources (Figure 1.5).

Communications Equipment

Field communications during a spill response will be handled via radios, telephones, cellular phones, fax machines, and computers and will be maintained by Company personnel. In the event of a Worst Case Discharge, field communications will be enhanced with contract resources as the situation demands.

Communications Type

Voice communications may be conducted over the public telephone system or Company provided two-way radio equipment.

Radios - Hand-held and vehicle-mounted radio sets are the most effective means of communication for the field response operation. The units are battery operated, multichanneled, and have a typical range that will cover the area of the response operation. Additional radio sets and battery packs/charges will be necessary in the event of a prolonged response operation.

Telephone (Conventional) - Conventional land line telephones are the most effective means of communication for regulatory and advisory notifications during a spill response operation. Additional telephone lines can be installed in the event of a prolonged response operation. All major facilities have access to standard telephone service.

Cellular - Cellular telephones are useful during spill events giving the user the ability to travel while using the communication system.

FAX Machines - FAX machines allow for a rapid transfer of information/documentation such as status reports/updates, written notifications, and purchase orders. All administrative offices have facsimile machines.

Computers - Computers are commonly used in networks which allow access to various other locations and company personnel. Computers also speed the consolidation of information and preparation of a written report.

FIGURE A.1 COMPANY OWNED SPILL RESPONSE EQUIPMENT

COMPANY OWNED RESPONSE EQUIPMENT					
5 SPILL RESPONSE TRAILERS (ONE PER RESPONSE ZONE)					
Description	Quantity				
Response boat 18.5 foot work boat with a 60 HP outboard	1				
Jon boat 14 foot Safety boat with a 9.9 hp	1				
34 ft Equipment trailer with 6 ft office includes equipment shelving, heat lights, power awning, rear ramp door and 1 side door. Roof rack for storage of the 14' boat and 500ft boom.	1				
River Boom 6" x 6'	500 ft				
Portable dam 50 ft	1				
Diesel /hydraulic Skimming System with diesel power transfer pump and hoses	1				
Sorbent pads	5 bales				
Sorbent boom	5 bales				
500 gallon portable tank	1				
2,000 gallon portable tank	1				
10,000 gallon portable bladder	1				
Winter equipment(e.g. Chain saws, chains, pry bars, ropes, ice, augers)	varies				
Bird Hazing Kit	1				
20' boom Trailer	1				

FIGURE A.2 RESPONSE RESOURCES Zone : Not determined

Area : Not determined							
OSRO Name	Contract Number	Environment Type	Facility Classification Level				
			MM	W1	W2	W3	
National Response Corporation	TBD	River/Canal	Х	Х	Х	Х	
		Inland	Х	Х	Х	Х	
		Open Ocean	Х	Х	Х	Х	
		OffShore	Х	Х	Х	Х	
		Near Shore	Х	Х	Х	Х	
		Great Lakes					
		1	1	1	1 1		

FIGURE A.3 USCG OSRO CLASSIFICATIONS

The USCG has classified OSROs according to their response capabilities, within each Captain of the Port (COTP) zone, for vessels and for facilities in four types of environments. Response capabilities are rated MM, W1, W2, or W3 as described below:

MINIMUM EQUIPMENT REQUIREMENTS FOR OSRO CLASSIFICATION							
Classification	Resource Quantity Guidelines	Maximum Facility Response Times	Maximum Vessel Response Times				
Rivers/Canals							
MM	Protective Boom: 4,000*ft EDRC:; 1,200 bbls TSC: 2,400 bbls	High Volume Ports: 6 hours Other Ports: 12 hours	High Volume Ports:12 hours Other Ports: 24 hours				
W1	Protective Boom: 25,000*ft EDRC:; 1,875 bbls TSC: 3,750 bbls	High Volume Ports: 12 hours Other Ports: 24 hours	High Volume Ports:12 hours Other Ports: 24 hours				
W2	Protective Boom: 25,000*ft EDRC:; 3,750 bbls TSC: 7,500 bbls	High Volume Ports: 30 hours Other Ports: 36 hours	High Volume Ports:36 hours Other Ports: 48 hours				
W3	Protective Boom:25,000*ft EDRC:; 7,500 bbls TSC: 15,000 bbls	High Volume Ports: 54 hours Other Ports: 60 hours	High Volume Ports:60 hours Other Ports: 72 hours				
	Great Lakes						
MM	Protective Boom: 6,000*ft EDRC:; 1,250 bbls TSC: 2,500 bbls	All Ports: 6 hours	All Ports: 12 hours				
W1	Protective Boom:30,000*ft EDRC:; 6,250 bbls TSC: 12,500 bbls	High Volume Ports: 12 hours Other Ports: 24 hours	High Volume Ports:12 hours Other Ports: 24 hours				
W2	Protective Boom:30,000*ft EDRC:; 12,500 bbls TSC: 25,000 bbls	All Ports: 36 hours	All Ports: 42 hours				
W3	Protective Boom:30,000*ft EDRC:; 25,000 bbls TSC: 50,000 bbls	All Ports: 60 hours	All Ports: 66 hours				
MINIMUM EQUIPMENT REQUIREMENTS FOR OSRO CLASSIFICATION							
--------------------------------------------------------	-----------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------				
Classification	Resource Quantity Guidelines	Maximum Facility Response Times	Maximum Vessel Response Times				
		Inland					
MM	Protective Boom:6,000*ft EDRC:; 1,200 bbls TSC: 2,400 bbls	High Volume Ports: 6 hours Other Ports: 12 hours	High Volume Ports: 12 hours Other Ports: 24 hours				
W1	Protective Boom: 30,000*ft EDRC:; 12,500 bbls TSC: 25,500 bbls	High Volume Ports: 12 hours Other Ports: 24 hours	High Volume Ports: 12 hours Other Ports: 24 hours				
W2	Protective Boom: 25,000*ft EDRC:; 12,500 bbls TSC: 25,500 bbls	High Volume Ports: 30 hours Other Ports: 36 hours	High Volume Ports: 36 hours Other Ports: 48 hours				
W3	Protective Boom: 25,000*ft EDRC:; 50,500 bbls TSC: 100,500 bbls	High Volume Ports: 54 hours Other Ports: 60 hours	High Volume Ports: 60 hours Other Ports: 72 hours				
		Great Lakes					
MM	Protective Boom: 8,000*ft EDRC:; 1,200 bbls TSC: 2,400 bbls	High Volume Ports: 6 hours Other Location: 24 hours	High Volume Ports: 12 hours Other Ports: 24 hours				
W1	Protective Boom: 30,000*ft EDRC:; 12,500 bbls TSC: 25,500 bbls	High Volume Ports: 12 hours Other Ports: 24 hours	High Volume Ports: 12 hours Other Ports: 24 hours				
W2	Protective Boom: 30,000*ft EDRC:; 25,500 bbls TSC: 50,500 bbls	High Volume Ports: 30 hours Other Ports: 36 hours	High Volume Ports: 36 hours Other Ports: 48 hours				
W3	Protective Boom: 30,000*ft EDRC:; 50,000 bbls TSC: 100,000 bbls	(for open ocean, plus travel time from shore) High Volume Ports: 54 hours Other Location: 60 hours	(for open ocean, plus travel time from shore) High Volume Ports: 60 hours Other Location: 72 hours				

MINIMUM EQUIPMENT REQUIREMENTS FOR OSRO CLASSIFICATION			
Classification	Resource Quantity Guidelines	Maximum Facility Response Times	Maximum Vessel Response Times
		Offshore	•
MM	Protective Boom:6,000*ft EDRC:; 1,200 bbls TSC: 2,400 bbls	High Volume Ports:6 hours Other Ports: 12 hours	High Volume Ports: 12 hours Other Ports: 24 hours
W1	Protective Boom: 15,000*ft EDRC: 12,500 bbls TSC: 25,500 bbls	High Volume Ports:24hours Other Ports: 48hours	High Volume Ports: 24 hours Other Ports: 48 hours
W2	Protective Boom: 15,000*ft EDRC: 25,000 bbls TSC: 50,000 bbls	High Volume Ports:30hours Other Ports: 36hours	High Volume Ports: 36hours Other Ports: 48hours
W3	Protective Boom: 15,000*ft EDRC: 50,000 bbls TSC: 100,000 bbls	High Volume Ports:54hours Other Ports: 60hours	High Volume Ports: 60hours Other Ports: 72hours
		Open Ocean	1
MM	Protective Boom: 0*ft EDRC: 1,200 bbls TSC: 2,400 bbls	High Volume Ports:6hours Other Ports: 12hours	High Volume Ports: 12hours Other Ports: 24hours
W1	Protective Boom: 0*ft EDRC: 12,500 bbls TSC: 25,000 bbls	High Volume Ports:6hours Other Ports: 12hours	High Volume Ports: 12hours Other Ports: 24hours
W2	Protective Boom: 0*ft EDRC: 25,000 bbls TSC: 50,000 bbls	High Volume Ports:30hours Other Ports: 36hours	High Volume Ports: 36hours Other Ports: 48hours
W3	Protective Boom: 0*ft EDRC: 50,000 bbls TSC: 100,000 bbls	High Volume Ports:54hours Other Ports: 60hours	High Volume Ports: 60hours Other Ports: 72hours
 Rivers/canals include bodies of water, including the Intracoastal Waterway and other bodies artificially created for navigation, confined within an inland area and having a project depth of 12 feet (3.66 meters). EDRC stands for "effective daily recovery capacity," or the calculated recovery capacity of oil recovery devices determined by using a formula that takes into account limiting factors such as daylight, weather, sea state, and emulsified oil in the recovered material. TSC stands for "temporary storage capacity," meaning sufficient storage capacity equal to twice the EDRC of an OSRO. Temporary storage may include inflatable bladders, rubber barges, certified barge capacity, or other temporary storage that can be utilized on scene at a spill response and which is designed and intended for the storage of flammable or combustible liquids. It does not include vessels or barges of opportunity for which no pre-arrangements have been made. Fixed shore-based storage capacity, ensured available by contract or other means, will be acceptable. 			

* In addition, 1,000 feet of containment boom plus 300 feet per skimming system.

FIGURE A.4 AGREEMENTS/CONTRACTS

NRC Packet

Decision Summary (DS-244)



To:	Richard Prior	Date:	October 14, 2008	
From:	John Hayes	Location:	Calgary, Alberta	
Subject:	NRC OSRO Resource Retainer			

Decision Proposed (\$125,000 per Annum(U.S. Currency) for 3 years)

Your approval is requested for funds related to emergency response planning and preparedness. As a matter of risk mitigation and regulatory compliance, it is proposed to enter into a contractual retainer to address a number of emergency response functions during operations. This amount falls within the existing capital expenditures for emergency response for 2009.

Background

National Response Corporation (NRC) will provide Keystone with Oil Spill Response Organization (OSRO) resources. Specifically, NRC will be the overall coordinating company that has the ability to safely respond to spill related incidents along the pipeline. NRC ensures spill readiness which included supplier subcontracts, training, workshops and overall spill site coordination. NRC has the proven ability to handle spills of all sizes and is approved by the United States Coastguard.

NRC has its own equipment, spill managers and a network of related industries to ensure Keystone is prepared to respond efficiently and effectively. The retention of a contractor is mandatory for Keystone to meet regulatory requirements. Having a retainer guarantees Keystone the resources when most needed.

The contract should start on January 1, 2009 and will form part of the existing Emergency Response Plan for 2009. This type of contract was not contemplated in the original Emergency Response budget of 3MM, but is part of the overall plan. The first year will be absorbed by the existing budget and for future years, these costs should be part of a field operations budget.

Requested by:	
	14 October 2008
John Hayes – Operations Manager Keystone Pipeline	Date

Approved by:	
0/10	
Pal Silling	- 14 Ortober 2008
Kob Silmer	170000
Integration Manager, Keystone Pipeline	Date

National Response Corporation, Inc.

National Response Corporation, Inc. is an Oil Spill Response Organization contracted to conduct oil recovery for TransCanada Keystone Limited Partnership and TC Oil Pipeline Operations, Inc. National Response Corporation uses a network of associated cleanup contractors throughout North America and the world. National Response Corporation has been certified by the United States Coast Guard, as described in the Emergency Response Manual, to respond to releases along the length of the Pipeline.

For further information about National Response Corporation and a list of response equipment you can visit their website at http://www.nrcc.com.



APPENDIX B

DISPOSAL PLAN

B.1 OVERVIEW

A major oil spill response would generate significant quantities of waste materials ranging from oily debris and sorbent materials to sanitation water and used batteries. All these wastes need to be classified and segregated (i.e., oily, liquid, etc.), transported from the site, and treated and/or disposed at approved disposal sites. Each of these activities demands that certain health and safety precautions be taken, which are strictly controlled by Federal and State Laws and Regulations. This Section provides an overview of the applicable State Regulations governing waste disposal, and a discussion of various waste classification, handling, transfer, storage, and disposal techniques. It is the responsibility of the Environmental Unit to manage waste disposal needs during an oil spill cleanup.

B.2 WASTE CLASSIFICATION

Oily-Liquid Wastes

Oily liquid wastes (i.e., oily water and emulsions) that would be handled, stored, and disposed during response operations are very similar to those handled during routine storage and transfer operations. The largest volume of oily liquid wastes would be produced by recovery operations (e.g., through the use of vacuum devices or skimmers). In addition, oily water and emulsions would be generated by vehicle operations (e.g., spent motor oils, lubricants, etc.), and equipment cleaning operations.

Non-Oily -Liquid Wastes

Response operations would also produce considerable quantities of non-oily liquid wastes. Water and other non-oily liquid wastes would be generated by the storage area and stormwater collection systems, equipment cleaning (i.e., water contaminated with cleaning agents), and office and field operations (i.e., sewage, construction activities).

Solid Wastes

A solid waste is defined as any discarded material provided that it is not specifically excluded under the regulations. These exclusions cover materials such as domestic sewage and mixtures of sewage discharged through a sewer system or industrial wastewater point source discharges.

A discarded material is any material which is abandoned (disposed, burned or incinerated) or accumulated, stored or treated prior to being abandoned. A discarded material is also any material recycled or any material considered inherently wastelike. Recycled material is considered solid waste when used in a manner constituting disposal, placed on land or burned for energy recovery.

A solid waste may be considered a hazardous waste. A solid waste, as defined above, may be a hazardous waste if it is not excluded from regulation and is either a listed hazardous waste or exhibits the characteristics of a hazardous waste. A solid waste exhibits the characteristics of a hazardous waste if it exceeds the thresholds established in determining the following:

- 1. Ignitability
- 2. Corrosivity
- 3. Reactivity
- 4. Toxicity

A solid waste may also become a hazardous waste if it is mixed with a listed hazardous waste or, in the case of any other waste (including mixtures), when the waste exhibits any of the characteristics identified above.

Oily -Solid / Semi-Solid Wastes

Oily solid/semi-solid wastes that would be generated by containment and recovery operations include damaged or worn-out booms, disposable/soiled equipment, used sorbent materials, saturated soils, contaminated beach sediments, driftwood, and other debris.

Non-Oily -Solid / Semi-Solid Wastes

Non-oily solid/semi-solid wastes would be generated by emergency construction operations (e.g., scrap, wood, pipe, and wiring) and office and field operations (i.e., refuse). Vessel, vehicle, and aircraft operations also produce solid wastes.

B.3 WASTE HANDLING

A primary concern in the handling of recovered oil and oily debris is contaminating unaffected areas or recontaminating already cleaned areas. Oily wastes generated during the response operations would need to be separated by type and transferred to temporary storage areas and/or transported to incineration or disposal sites. Proper handling of oil and oily wastes is imperative to ensure personnel health and safety.

Safety Considerations

Care shall be taken to avoid or minimize direct contact with oily wastes. All personnel handling or coming into contact with oily wastes shall wear protective clothing. A barrier cream can be applied prior to putting on gloves to further reduce the possibility of oily waste absorption. Safety goggles shall be worn by personnel involved in waste handling activities where splashing might occur. Any portion of the skin exposed to oily waste should be washed with soap and water as soon as possible. Decontamination zones should be set up during response operations to ensure personnel are treated for oil exposure.

Wastes Transfer

During response operations, it may be necessary to transfer recovered oil and oily debris from one point to another several times before the oil and oily debris are ultimately recycled, incinerated or disposed at an appropriate disposal site. Depending on the location of response operations, any or all of the following transfer operations may occur:

- From portable or vessel-mounted skimmers into flexible bladder tanks, storage tanks of the skimming vessel itself, or a barge.
- Directly into the storage tank of a vacuum device.
- From a skimming vessel or flexible bladder to a barge.
- From a vacuum device storage tank to a barge.
- From a barge to a tank truck.
- From a tank truck to a processing system (e.g., oil/water separator).
- From a processing system to a recovery system and/or incinerator.
- Directly into impermeable bags that, in turn, are placed in impermeable containers.
- From containers to trucks.

There are four general classes of transfer systems that may be employed to affect oily waste transfer operations:

- **Pumps:** Rotary pumps, such as centrifugal pumps, may be used when transferring large volumes of oil, but they may not be appropriate for pumping mixtures of oil and water. The extreme shearing action of centrifugal pumps tends to emulsify oil and water, thereby increasing the viscosity of the mixture and causing low, inefficient transfer rates. The resultant emulsion would also be more difficult to separate into oil and water fractions. Lobe or "positive displacement" pumps work well on heavy, viscous oils, and do not emulsify the oil/water mixture. Double-acting piston and double acting diaphragm pumps are reciprocating pumps that may also be used to pump oily wastes.
- **Vacuum Systems:** A vacuum truck may be used to transfer viscous oils but they usually pick up a very high water/oil ratio.
- **Belt/Screw Conveyors:** Conveyors may be used to transfer oily wastes containing a large amount of debris. These systems can transfer weathered debris laden oil either horizontally or vertically for short distances (i.e., 10 feet) but are bulky and difficult to set up and operate.
- Wheeled Vehicles: Wheeled vehicles may be used to transfer liquid wastes or oily debris to storage or disposal sites. These vehicles have a limited transfer volume (i.e., 100 barrels) and require good site access.

B.4 WASTE STORAGE

Interim storage of recovered oil, oily and non-oily waste would be considered to be an available means of holding the wastes until a final management method is selected. In addition, the segregation of wastes according to type would facilitate the appropriate method of disposal. The storage method used would depend upon:

- The type and volume of material to be stored.
- The duration of storage.
- Access.

During an oil spill incident, the volume of oil that can be recovered and dealt with effectively depends upon the available storage capacity. Typical short-term storage options are summarized in Figure B.1. The majority of these options can be used either onshore or offshore.

If storage containers such as bags or drums are used, the container must be clearly marked with the proper Canadian Transport Dangerous Goods/United States Department of Transportation marking to indicate the type of material/waste contained and/or the ultimate disposal option.

Fuel barges may be the best option for temporary storage of oil recovered in open waters and frac tanks for inland spills. Depending on size, these vessels may be able to hold up to 6,000 barrels of oil and water and frac tanks may hold up to 500-550 barrels. The barge deck can be used as a platform for operating oil spill clean-up equipment and storing containment boom.

Steel or rubber tanks can be used to store oil recovered near the shoreline. To facilitate offloading, demulsifiers may be used to break emulsions prior to placing the recovered substance into the barges or storage tanks.

Use of any site for storage is dependent on the approval of the local authorities. The following elements affect the choice of a potential storage site:

- Geology
- Ground water
- Soil
- Flooding
- Surface water
- Slope
- Covered material
- Capacity
- Climatic factors
- Land use
- Toxic air emissions
- Security
- Access
- Public contact

B.5 WASTE DISPOSAL

Techniques for Disposal of Recovered Oil

Recovery, reuse, and recycling are the best choices for remediation of a spill, thereby reducing the amount of oily debris to be bermed onsite or disposed of at a solid waste landfill. Treatment is the next best alternative, but incineration and burning for energy recovery have more options within the state. There are some limitations and considerations in incinerating for disposal. Environmental quality of incineration varies with the type and age of the facility. Therefore, when incineration becomes an option during an event, local air quality authorities would be contacted for advice about efficiency and emissions of facilities within their authority. Approval of the local air authorities is a requirement for any incineration option. Landfilling is the last option. Final disposal at a solid or dangerous waste landfill is the least environmentally sound method of dealing with a waste problem such as oily debris.

Note: Prior to the disposal of ANY waste products, the Incident Commander or his designee must contact the Keystone / TransCanada Community, Safety and Environmental Department to receive direction and guidance on the proper disposal methods and procedures.

During an oil spill incident, the Company would consult with the proper regulating agency to identify the acceptable disposal methods and sites appropriately authorized to receive such wastes. The Company maintains a list of approved disposal sites that satisfy local, Province/State, and Federal

Regulations and Company requirements: This identification of suitable waste treatment and disposal sites would be prepared by the Environmental Unit in the form of an Incident Disposal Plan which must be authorized by the U.S. Coast Guard and/or the Environmental Protection Agency or National Energy Board.

An Incident Disposal Plan would include predesignated interim storage sites, segregation strategies, methods of treatment and disposal for various types of debris, and the locations/contacts of all treatment and disposal site selections. Onsite treatment/disposal is preferred.

In order to obtain the best overall Incident Disposal Plan, a combination of methods should be used. There is no template or combination of methods that can be used in every spill situation. Each incident should be reviewed carefully to ensure that an appropriate combination of disposal methods is employed.

The different types of wastes generated during response operations would require different disposal methods. To facilitate the disposal of wastes, they should be separated by type for temporary storage, transport and disposal. Figure B.2 lists some of the options that would be available to segregate oily wastes. The figure also depicts methods that may be employed to separate free and/or emulsified water from the oily liquid waste.

The following is a brief discussion of some disposal techniques available for recovered oil and oily debris.

Recycling

This technique entails removing water from the oil and blending the oil with uncontaminated oil. Recovered oil can be shipped to refineries provided that it is exempt from hazardous waste regulations. There it can be treated to remove water and debris, and then blended and sold as a commercial product.

The Company's designated Disposal Specialist is responsible for ensuring that all waste materials be disposed at an internally approved disposal site.

Incineration

This technique entails the complete destruction of the recovered oil by high temperature thermal oxidation reactions. There are licensed incineration facilities as well as portable incinerators that may be brought to a spill site. Incineration may require the approval of the local Air Pollution Control Authority. Factors to consider when selecting an appropriate site for onsite incineration would include:

- Proximity to recovery locations.
- Access to recovery locations.
- Adequate fire control.
- Approval of the local air pollution control authorities.

In Situ Burning / Open Burning

Burning techniques entail igniting oil or oiled debris and allowing it to burn under ambient conditions. These disposal techniques are subject to restrictions and permit requirements established by federal, province/state and local laws. They would not be used to burn Polychlorinated biphenyls, waste oil containing more than 1,000 parts per million of halogenated solvents, or other substances regulated by the Environmental Protection Agency or Environment Canada. Permission for in situ burning may be difficult to obtain when the burn takes place near populated areas.

As a general rule, in situ burning would be appropriate only when atmospheric conditions will allow the smoke to rise several hundred feet and rapidly dissipate. Smoke from burning oil will normally rise until its temperature drops to equal the ambient temperature. Afterwards, it will travel in a horizontal direction under the influence of prevailing winds.

Landfill Disposal

This technique entails burying the recovered oil in an approved landfill in accordance with regulatory procedures. Landfill disposal of free liquids is prohibited by Federal Law in the United States.

With local health department approval, non-burnable debris which consists of oiled plastics, gravel and oiled seaweed, kelp, and other organic material may be transported to a licensed, lined, approved municipal or private landfill and disposed of in accordance with the landfill guidelines and regulations. Landfill designation would be planned only for those wastes that have been found to be unacceptable by each of the other disposal options (e.g., waste reduction, recycling, energy recovery). Wastes would be disposed only at Company-approved disposal facilities. The Disposal Specialist is responsible for ensuring that all waste materials are disposed at a Company internally approved disposal site. Disposal at a non-approved facility would require approval by the Disposal Specialist prior to sending any waste to such a facility.

CONTAINER	ONSHORE	OFFSHORE	SOLIDS	LIQUIDS	NOTES
Barrels	Х	Х	x	x	May require handling devices. Covered and clearly marked.
Tank Trucks	Х	х		x	Consider road access. Barge-mounted offshore.
Dump/Flat Bed Trucks-Roll-offs	x		x		May require impermeable liner and cover. Consider flammability of vapors at mufflers.
Barges		Х	x	x	Liquids only in tanks. Consider venting of tanks.
Oil Storage Tanks	х	х		x	Consider problems of large volumes of water in oil.
Bladders	х	х		х	May require special hoses or pumps for oil transfer.
Frac Tanks	х			х	Consider road access.

FIGURE B.1 TEMPORARY STORAGE METHODS

FIGURE B.2 OILY WASTE SEPARATION AND DISPOSAL METHODS

TYPE OF MATERIAL	SEPARATION METHODS	DISPOSAL METHODS
LIQUIDS		
Non-emulsified oils	Gravity separation of free water	Incineration Use of recovered oil as refinery/production facility feedstock
Emulsified oils	Emulsion broken to release water by:	Use of recovered oil as refinery/production facility feedstock
SOLIDS		
Oil mixed with sand and soil	Collection of liquid oil leaching from sand during temporary storage Extraction of oil from sand by washing with water or solvent Removal of solid oils by sieving	Incineration Use of recovered oil as refinery/production facility feedstock Direct disposal Stabilization with inorganic material Degradation through land farming or composting
Oil mixed with cobbles or pebbles	Screening Collection of liquid oil leaching from materials during temporary storage Extraction of oil from materials by washing with water or solvent	Incineration Direct Disposal Use of recovered oil as refinery/production facility feedstock
Oil mixed with wood and sorbents	Screening Collection of liquid oil leaching from debris during temporary storage Flushing of oil from debris with water	Incineration Direct disposal Degradation through land farming or composting for oil mixed with seaweed or natural sorbents

APPENDIX C

BASICS OF OIL SPILL RESPONSE

C.1 DIKES, BERMS AND DAMS

Dikes, berms, and dams are land-based tactics, with the objective of containing spilled oil and limiting spreading of oil slicks, thus minimizing impacts to the environment. Dikes, berms and dams are embankment structures built-up from the existing terrain, placed to contain and accumulate oil for recovery. These barriers can serve to:

- Contain and stabilize a contaminated area.
- Contain or divert oil on water or oil that has potential to migrate.
- Create cells for recovery.
- Use natural depressions to act as containment areas for recovery.

The tactic may be deployed in association with a recovery tactic, such as Shoreline Recovery or On-land Recovery. Dikes, berms, and dams are most effective when placed before oil arrives. Dikes, berms, and dams can also be used to exclude oil from a sensitive area, which is covered in the Beach Berms and Exclusion Dams tactic. The tactic can also be used in conjunction with an excavation tactic to enhance containment volumes (see Pits, Trenches, and Slots). The general strategy is to:

- 1. Identify the location and trajectory of the spill or potential spill.
- 2. Plan a deployment configuration that best supports the operating environment and available resources.
- 3. Mobilize to the location and deploy response resources.
- 4. Construct the containment structure and ensure it does not leak.
- 5. Consider the need to remove any water-bottom that may collect beneath the oil inside the structure.
- 6. Monitor the containment structure on an appropriate basis.
- 7. If oil collects in the structure, utilize an appropriate recovery system for removal.

Tactic Description

This tactic involves building an embankment perpendicular to the flow of the oil slick or around a contaminated area. Dike, berm, and dam structures can be constructed with a wide variety of materials including: soil, gravel, snow, sand bags, oil boom, timbers and logs. Selection of the construction material depends on the operating environment, location, available materials, and whether the structure is to be temporary or permanent. The containment area should be lined with an impermeable membrane, such as plastic sheeting, to keep oil and oily water from leaking or migrating into the soil. The structure may include a method to regulate flow, such as a weir or spill way. Dikes, berms, and dams can be built by manual labor or with earth-moving equipment depending on the location and available resources.

Deployment Configurations

BERMS

A containment berm can be constructed of available materials such as earth, gravel, or snow. Use earth-moving equipment or manual labor to construct the berm. Form the materials into a horseshoe shape ahead of the flow of oil. Use plastic sheeting to line the walls of a soil berm to prevent oil penetration. Sandbags filled with sand or other heavy material also make excellent containment barriers.

DAMS

An underflow dam can be used when there is too much water flow to allow for a complete blockage of a drainage channel. The dam is built of earth, gravel, or other barriers such as sandbags or plywood sheets. Wherever possible, line the upstream side of the dam with plastic sheeting to prevent erosion and penetration of oil into the dam material. Underflow dams use inclined culverts or pipes to move water downstream while leaving the spill contained behind the dam. The capacity of the pipe(s) should exceed the stream flow rate. It may be necessary to use pumps to remove water behind a dike. Valves or culvert plugs can also be used to control flow rate. Pipes must be placed on the upstream side of the dam, with the elevated end on the downstream side. Make sure that the upstream end of the pipe is submerged and below the oil/water interface. The height of the elevated downstream end of the pipe will determine the water level behind the dam.

EXISTING ROADS

Roadways that are built up above the terrain can be used as dikes. However, road construction usually allows for natural drainage through culverts or bridges. These drainage structures must be controlled to turn the road into a barrier.

CULVERT BLOCKING

A culvert can be blocked using sheet metal, plywood barriers, or inflatable culvert plugs. Use a full block only when the culvert will be blocked for the entire cleanup operation, if the oil floating on the water will not contaminate additional soil or tundra, and if blocking the water flow will not threaten the road. Otherwise, an adjustable weir or culvert plug should be used. Plywood and/or sandbags can also be used as culvert blocks, but are more labor-intensive and pose a higher potential for injury. A wood block may require a headwall with kickers oriented to support the boards or plywood. Place the blocking materials over the upstream end of the culvert. Plastic sheeting over the outside of the block will prevent oil penetration.



FIGURE C.1 Culvert Blocking

EARTH MOVING EQUIPMENT

A bulldozer, road grader, or front-end loader drives around the spill with its blade angled towards the spill, pushing earth or snow into a berm. Once the perimeter has been covered with an initial berm, shore-up areas as necessary.

SNOW

Because of the absorbent quality of snow, it makes an excellent berm for both containment and recovery. A snow berm can be strengthened by spraying it with a fine water mist that forms an ice layer on top of the snow. A snow berm is built around the areas of heaviest oiling to contain oil or diesel spilled to tundra and/or ice in winter.

MESH FENCE

Plastic mesh fencing may be used to quickly construct an underflow dam system. The mesh fencing is placed across the drainage and held in place with stakes. Absorbent boom, oil boom, plywood, or even dry dead grass can be placed on the upstream side of the fencing. Running water will find its way under the barrier fence, but oil floating on top of the water will be trapped. The advantages of this system are that it is lightweight and mobile.

C.2 DEFLECTION BOOM

Objective & Strategy

The objective is to direct spilled oil away from a location to be protected or simply to change the course of the slick. "Deflection" is used to describe the tactic where oil is redirected away from an area but not recovered.

Tactic Description

The boom is placed at an optimum angle to the oil trajectory, using the movement of the current to carry oil along the boom and then releasing it into the current again with a new trajectory. The angle is chosen to prevent oil from entraining beneath the boom skirt. Boom may be held in place by anchors, vessels, or a boom control device.

Deflection Boom may be used to temporarily avoid impacts to a sensitive area, but there is no recovery associated with the tactic, thus no oil is removed from the environment.

The general strategy is to:

- 1. Identify the location and trajectory of the spill or potential spill.
- 2. Identify, prioritize, and select sensitive areas to be protected from impact.
- 3. Select a deployment configuration that best supports the operating environment and available resources.
- 4. Mobilize to the location and deploy the tactic.
- 5. Place boom using secured anchor systems, mooring points, vessels, boom control devices, etc.
- 6. Monitor and adjust the boom on an appropriate basis.

BOOM ANGLE

Select the appropriate boom angle to keep oil from entraining under the boom. Where currents exceed 3 knots the boom must be almost parallel to the current to prevent entrainment. In currents exceeding 3 knots, a cascade of boom arrays may be used; the first boom array will slow the velocity of the slick allowing subsequent arrays to deflect the oil.

ANCHOR SYSTEMS

Boom is secured in place using standard anchoring systems. Anchor sizes vary depending on the boom type and the operating equipment.

DEPLOYMENT CONFIGURATIONS

Single Boom

Boom is deployed from a site at an optimum angle to the current and anchored to deflect the oil away from a location. Figures C.2 and C.3 illustrate two single boom deflection techniques.



FIGURE C.3

Deflective Booming Technique (Single Boom Method)





FIGURE C.4

Cascade

Several booms are deployed in a cascade configuration when a single boom cannot be used because of fast current or because it is necessary to leave openings in the boom for vessel traffic, etc. This configuration can be used in strong currents where it may be impossible to effectively deploy one continuous section of boom. Shorter sections of boom used in a cascade deployment are easier to handle in faster water, thereby increasing efficiency. Additional equipment may be required to set and maintain this system as compared to the single boom configuration.

C.3 CONTAINMENT BOOM

Objective & Strategy

Containment booming is a fixed-boom tactic. The objective is to corral spilled oil on the water, usually near the source, thus minimizing spreading and impacts to the environment. It is usually deployed with Shoreline Recovery.

This tactic can be deployed for oil spill migrating downstream or downhill to water or through water.

The general strategy is to:

- 1. Identify the location and trajectory of the spill or potential spill.
- 2. Select a deployment configuration that best supports the operating environment and available resources.
- 3. Mobilize to the location and deploy the tactic.
- 4. Place boom, using secure anchor system or mooring points.
- 5. Monitor the boom on an appropriate basis.
- 6. If oil collects in the boom, utilize an appropriate recovery tactic to remove it.

Tactic Description

Containment boom systems are comprised of the appropriate oil boom for containment and concentration, and anchoring systems to hold the boom in place.

Containment boom systems are not recommended for the fast water environment because of the high probability of fixed-boom failure and the difficulty of anchoring in this environment.

Containment boom systems are not recommended for the broken ice environment, because of the high probability of fixed-boom failure and loss due to ice encounters.

Anchoring systems are often deployed first and then the boom is set from one anchor to the adjacent anchor. Boom can be placed from shoreline to shoreline.

A second layer of containment boom, outside the primary boom, has two advantages:

- 1. It breaks the sea chop and reduces its impact on the primary boom,
- 2. It may capture oil that has escaped if the primary boom fails.

Figure C.5 illustrates a simple containment booming technique.

Deployment Considerations

- It is often advisable to "line" the containment boom with sorbent materials (passive recovery) to recover the sheen and reduce decontamination costs.
- If the oil slick is moving, due to wind or current, consider containment at the source and ahead of the leading edge.
- If spill is moving in excess of 1 knot consider the Diversion Boom Tactic.
- Anchor systems must be selected based on the maximum stress that might be expected to occur on the boom array, considering stronger currents and winds than when the anchor is set.
- Site conditions will influence deployment configuration options.
- Combinations of Containment Boom and Diversion Boom tactics are often used together to optimize success.



FIGURE C.5

Containment Booming Technique (Catenary Method)

C.4 DIVERSION BOOM

Objective & Strategy

The objective is to redirect the spilled oil from one location or direction of travel to a specific site for recovery. For the purposes of maintaining consistent and clear terms, diversion is always associated with oil recovery, in contrast with the term deflection, which is used to describe the tactic where oil is redirected away from an area but not recovered.

Tactic Description

The Diversion Boom tactic is for water-born spills where there is some current, usually from 0.5 to 3.0 knots. The boom is placed at an optimum angle to the oil trajectory, using the movement of the current to carry oil along the boom to a recovery location. The angle is chosen to prevent oil from entraining beneath the boom skirt. Oil can be diverted to a shoreline or away from a shoreline or shoal waters. This tactic is always associated with a Shoreline Recovery. Figures C.6 and C.7 illustrate two diversionary booming techniques. These techniques are the Open Chevron and the Closed Chevron technique respectively.







FIGURE C.7

ANCHOR SYSTEMS

Boom is secured in place using standard anchoring systems. Anchor sizes vary depending on the boom type and the operating environment.

Boom Angle

Select the appropriate boom angle to keep oil from entraining under the boom. Note that the angle relative to the current decreases rapidly as the current increases. Where currents exceed 3 knots the boom must be almost parallel to the current to prevent entrainment. In currents exceeding 3 knots, a cascade of boom arrays may be used; the first boom array will slow the velocity of the slick allowing subsequent arrays to deflect the oil.

Single Boom

A basic diversion technique is to divert oil from a current to a recovery site along a shoreline. The recovery site is chosen where there is minimal current and a suitable recovery system can be deployed. The boom is then anchored at the site and deployed at an optimum angle to the current and secured/anchored to divert the oil to the shoreline for recovery.

C.5 SHORELINE RECOVERY

Objective & Strategy

The objective is to remove spilled oil that has been diverted to a designated recovery site accessible from the shore.

Shoreline Recovery is usually deployed as part of another tactic, such as Diversion Boom strategy. When deployed in conjunction with another tactic, fewer personnel may be required.

The general strategy is to:

- 1. Identify the primary recovery site.
- 2. Assess site conditions and access routes.
- 3. Determine the appropriate recovery and storage systems based on oil type, access, and deployment restrictions.
- 4. Mobilize and deploy equipment to recover and temporarily store the oil from the recovery site.
- 5. Take precautions to minimize contamination of the shoreline at the collection site.
- 6. Man and monitor the system as appropriate.
- 7. Store and transfer recovered oil and oily water according to an approved waste management plan.

Tactic Description

Shoreline recovery systems can be deployed from land access routes (beaches, all-terrain vehicles), or water access. Access to the recovery site and the oil type will influence/dictate the options of equipment to be used.

SKIMMING SYSTEMS

Shoreline recovery requires at least one portable skimming system to remove spilled oil. The typical portable skimming system includes:

- Skimmer with pump and power pack
- Hose (suction and discharge with fittings)
- Oil transfer and decanting pump(s)
- Repair kit (tools and extra parts)

There are many models of skimmers to choose from, but they all fall into three types:

- Weir skimmers draw liquid from the surface by creating a sump in the water into which oil and water pour. The captured liquid is pumped from the sump to storage. Weir skimmers can recover oil at high rates, but they can also recover more water than oil, especially when the oil is in thin layers on the surface of the water. This creates the need to separate the water from the oil and decant it back into the environment. Otherwise, the recovered water takes available storage volume. Weir skimmers are best employed where oil has been concentrated into thick pools or where there are very large volumes of oil and recovered liquid storage capacity.
- **Oleophilic skimmers** pick up oil that adheres to a collection surface, leaving most of the water behind. The oil is then scraped from the collection surface and pumped to a storage device. Oleophilic skimmers do not recover oil as fast as weir skimmers, but they have the advantage of recovering very little water. Oleophilic skimmers may be used where oil is very thin on the surface. Oleophilic skimmers are a good choice where liquid storage capacity is limited.
- **Suction skimmers** use a vacuum to lift oil from the surface of the water. These skimmers require a vacuum pump or air conveyor system. Like weir skimmers, suction skimmers may also collect large amounts of water if not properly operated. Most suction skimmers are truck mounted and work best at sites with road access.

Primary Oil Storage Devices

Primary oil storage devices for shoreline recovery can be portable tanks, bladders, or truck-mounted tanks on the shoreline. If access is not restricted, larger systems can be used and deployed by heavy lifting equipment. If the site is accessible by road, vacuum trucks may be used for oil recovery, storage, and transport.

Recovery Location

Selection of a shoreline recovery location is critical to the success of this tactic. A recovery site should be in calm water with minimal currents. The site must have enough level ground to set up and operate a power pack and portable tanks. Sites with road access are preferred, but if not available, the site must have some other suitable access. Shelter, food and water for the response crew must also be considered in selecting a site.

C.6 ICE OPERATIONS

Objective & Strategy

Much like that of diversion booming, the objective is to redirect the spilled oil from one location or direction of travel to a specific site for recovery. With a layer of ice preventing the use of booming equipment, other response strategies must be employed.

Tactic Description

ICE SLOTTING

Ice slotting (Figure C.8) may be used in cases where the ice is thick enough to support the response equipment and personnel. Consideration for the weakening and cracking of the ice must be taken when conducting ice slotting operations. Slotting Angle The slot should be angled at approximately 30 degrees to the river's edge. The slotting needs to be wide enough to place a skimming system into the water to recover the oil. The lead end of the slot should have a slight curve which parallels the river current to allow the current to push the oil towards the recovery area.



DEFLECTION BOARDS

In place of using booming equipment it may be possible to use flat boards, such as plywood, to divert the oil under the ice into a recovery area, which has been cut out. To use this form of diversion, the depth of the water under the ice and the speed of the current ice must be considered. The angle in which the boards are placed is derived much like that of deflection booming. In any current above 3 knots, a series of cascading boards should be considered. Also, the depth of the water must be considered. The stronger the current the deeper the boards must be placed to prevent entrainment. If the water is not deep enough to place the boards to prevent entrainment, ice slotting methods may be required. Figure C.9 illustrates the overall method of using deflective boards. Figure C.10 illustrates a close up of the deflective board response method.



FIGURE C.10 Close up view of the Deflective Board Strategy



APPENDIX E

Pipeline Temperature Effects Study

-Page intentionally left blank-

Appendix E Pipeline Temperature Effects Study

TransCanada Pipeline, LP (Keystone) has assessed how the proposed 36 inch 900,000 bpd pipeline will affect soil temperatures along the proposed route. The assessment considered the following factors:

- (a) Temperature of the proposed pipeline, including variation with time and/or distance along the route.
- (b) Heat flux from the proposed pipeline into the surrounding soil, including variation with time.
- (c) Expected changes to soil temperature profiles, including variation with time and distance from the pipeline.
- (d) At what distance from the pipeline will elevated soil temperature be undetectable?
- (e) How many acres of land in total will experience significantly elevated soil temperatures?
- (f) How will crops and vegetation be affected by any increased temperature?

(a) Temperature of the proposed pipeline, including variation with time and/or distance along the route.

Steady-state temperature profiles were modeled for the Keystone XL Project (Project) for winter and summer operations at 900,000 barrels per day (bbl/d) (**Figure 1**). These profiles are based on assumed oil properties, as well as soil temperatures and thermal conductivities along the pipeline route. The analysis assumes that the pipeline ships 80 percent diluted bitumen and 20 percent synthetic crude.

In general, temperatures of the pipe exterior are higher in the summer months than in the winter months due to the ambient air and soil temperatures. Similarly, temperatures generally increase as volumes increase.

(b) Heat flux from the proposed pipeline into the surrounding soil, including variation with time.

A series of heat flux were calculated using a one-dimensional shape factor model that is based on the calculated steady-state pipe temperatures provided in response a) above, and the undisturbed soil temperatures and thermal conductivities at pipeline depth along the route. (**Figure 2**). These figures are based on a thermal conductivity profile along the Project route.

Although the temperatures of both the soil and the oil in the pipe are higher in summer than in winter, the steady-state heat flux is not expected to vary much throughout the year since it is proportional to the difference between the pipe and soil temperatures, and this difference does not vary much at different times of year (i.e., when soil temperatures are higher, so are flowing temperatures within the pipe).






Figure 2

(C) Expected changes to soil temperature profiles, including variation with time and distance from the pipeline.

Baseline soil temperatures were developed using long-term climate and soils data from the following locations:

- Near Glasgow, Montana;
- Near Sioux Falls, South Dakota;
- Near Lincoln, Nebraska;
- Near Wichita, Kansas;
- Near Oklahoma City, Oklahoma; and
- Near Houston, Texas.

The anticipated, year-after-year, pipeline temperature variations for the 900,000 bbl/d cases provided in the response to part a) above were also utilized.

These areas of the pipeline route were selected for comparative review since an abundance of climate and soils data was publicly available to support the analyses. These temperature data are representative of the temperature profile along the pipeline route:

Temperature Contour for 900,000 bbl/d

Figures 3 through **32** show the temperature profiles around and alongside the pipeline operating at 900,000 bbl/d for selected months. As shown in the figures, the pipeline does have some effect on surrounding soil temperatures, primarily at pipeline depth. Surficial soil temperatures relevant to vegetation are impacted mainly by climate with negligible effect attributable to the operating pipeline. The thermally influenced contour intervals are represented by colored contours, the corresponding temperatures are shown at the bottom of the figures.

Glasgow, Montana Figure 3 to Figure 7:



Figure 3



Figure 4



Figure 5



Figure 6



Figure 7

Sioux Falls, South Dakota Figure 8 to Figure 12



Figure 8



Figure 9



Figure 10



Figure 11



Figure 12

Lincoln, Nebraska Figure 13 to Figure 17



Figure 13



Figure 14



Figure 15



Figure 16



Figure 17





Figure 18



Figure 19



Figure 20



Figure 21



Figure 22

Oklahoma City, Oklahoma Figure 23 to Figure 27



Figure 23



Figure 24



Figure 25



Figure 26



Figure 27

Houston, Texas Figure 28 to Figure 32



Figure 28



Figure 29



Figure 30



Figure 31



Figure 32

(d) At what distance from the pipeline will elevated soil temperature be undetectable?

The analyses shown in part c) above were used to predict the potential effect on soil temperatures at specified distances from the pipe centerline at the surface and at a depth of 6 inches. This largely defines the region of soil of most relevance to vegetation. The effects are summarized in the figures below, which were established for 900,000 bbl/d case. The results indicate that the operating pipeline has negligible effects to these surficial soil temperatures.

Temperature Contour for 900,000 bbl/d

The temperature profiles from the centerline of the pipe at the ground surface and at a depth of six inches below the surface, as affected by the pipeline operating at 900,000 bbl/d, are provided in **Figure 33** to **Figure 44**. These figures show that temperatures above the pipeline and at various distances from it deviate minimally from the background temperature. This demonstrates that there is minimal effect on surficial soil temperatures due to the operating pipeline. This is particularly evident during the growing season, when surficial temperatures are primarily affected by climate.



Figure 33



Figure 34





Figure 36



Figure 37



Figure 38



Figure 39



Figure 40



Figure 41



Figure 42



Figure 43



Figure 44

(e) How many acres of land in total will experience significantly elevated soil temperatures?

Based on the above data, Keystone does not anticipate that the operation of the pipeline will result in significant effects to surficial soil temperatures, particularly during the growing season.

(f) How will crops and vegetation be affected by any increased temperature?

Pipeline operation will modify soil temperatures in an area surrounding the pipe. Temperature profiles indicate that the effects of pipeline-elevated soil temperatures vary seasonally and are minor near the surface where most root zones lie. Potential positive vegetation responses to increased soil temperatures may include accelerated seedling emergence and increased production over the trenchline. Potential negative vegetation responses to increased water availability and decreased production over the trenchline. To analyze the potential thermal effects of pipeline operation on vegetation, a variety of literature sources and vegetation experts with experience monitoring reclaimed pipelines were consulted. Findings are presented below by issue.

i. Literature review of the effect of elevated soil temperature on vegetation.

Limited information is available regarding the specific thermal effects of pipeline operation on vegetation (see Section ii); however, extensive research has been conducted to assess the effects of elevated soil temperatures in general on vegetation development and production. **Table 1** summarizes typical results and is organized according to common vegetation and crop types that would be crossed by the Project. These data describe common effects of soil temperature on plant growth. Specific vegetation response to soil temperature in each study were also influenced by factors such as soil type, soil moisture, weather, land management practices, or competition with other vegetation species.

Vegetation/Crop Type and Experimental Soil Temperature Range	Enhanced Growth Effects	Negative Growth Effects
Big bluestem: Tall-grass prairie species (44° to 95° F) ^a	 Earlier germination and emergence. Faster growth rate. Higher net photosynthesis. Gre ater total biomass. Strong growth dependence on soil temperature 	 No negative effects reported although optimum soil temperatures for greatest biomass production were 77° F.
Various wetland species (41° to 86° F) ^b	 Stem density increased with increasing soil temperature. Total and annual species richness positively correlated with temperature. 	 N one reported although perennial species richness was unresponsive to temperature increases.
Spring Wheat (60° to 105° F) ^c	Occasional higher soil moisture.Occasional higher crop yield.	• N one reported.
Corn (50° to 105° F)	 Warmer early-season soil temperatures hasten plant emergence and development.^d Optimum germination occurs at soil temperatures of 85 ° F. ^e Yield increases with higher soil temperatures at planting (75° to 85° F).^f Soil temperatures late in summer less important than air temperature f 	 None reported. Effect of high soil temperatures in late summer secondary to effects of high air temperature, low soil moisture, and corresponding drought. ^f
Soybeans (50° to 109° F)	 Optimum soil temperatures for germination is 82° F.ⁱ Soybean has competitive advantage over weeds when soil temperatures promote soybean germination. ^j 	 None reported. Similar to corn, effect of high soil temperatures in late summer secondary to high air temperature, low soil moisture, and corresponding drought.^j

Table 1Effects of Elevated Soil Temperature on Typical Vegetation Crossed by the
Keystone XL Pipeline

a (Delucia et al. 1992); b (Seabloom 1998); c (Dunn et al. pre-published draft); d (Bollero 1996); e (Parsons 2001); f (Riley 1957); i (Tyagi and Tripathi 1983); j (Berglund a Helms 2003).

ii. Literature review of the thermal effect of pipelines on soil temperature and vegetation.

Very few studies have been conducted to assess the thermal impacts of natural gas or crude oil pipeline operation on soil temperature and/or vegetation (Naeth et al. 1993, Fisher et al. 2000, Dunn et al. pre-published draft). Naeth et al. (1993) recorded soil temperatures at various depths over a natural gas pipeline in a Canadian mixed-grass prairie. Elevated winter soil temperatures were recorded below 24 inches, while summer soil temperatures were minimally affected by the pipeline, possibly due to decreased gas flow and increased air temperature. Negative effects on vegetation were not reported.

Fisher et al. (2000) reported increased stature and yield of alfalfa and corn over a natural gas pipeline in central New York. Temperatures fluctuated around the pipeline by season and distance from compressor stations. The ultimate reason for increased production over the pipeline could not be determined but may have been a combination of temperature and water availability.

The most comprehensive assessment of pipeline thermal effects on vegetation was completed on the natural gas Alliance Pipeline (Dunn et al. pre-published draft). Measurements of soil temperature, plant available soil water, and spring wheat and barley yield were completed upstream and downstream of a compressor station on the Alliance Pipeline in 2002, 2003, and 2004. Data collected from four sites downstream of a pump station (0.5 to 52 miles) were compared with a site 0.5 mile upstream of the compressor station at points directly over the trench, 6 and 43 feet away from the trench, and at different soil depths. Temperature varied from 60° F on the upstream side of the compressor station, to 105° F at 0.5 miles downstream of the compressor station. Temperature differences at these coolest and warmest points are shown in **Table 2**.

Distance from Compressor Station	Temperature (° F) Difference over Pipe Compared to 6 feet away from Pipe at 6 to 12 Inch Depth	Temperature (° F) Difference over Pipe Compared to 43 Feet away from Pipe at 6 to 12 Inch Depth		
0.5 Miles upstream (coolest point)	1.8 – 3.6	3.6 – 7.2		
0.5 Miles downstream (warmest point)	5.4 – 9.0	14.4 – 18.0		

Table 2	Soil Temp	perature	Differences	Measured	Over a	Natural	Gas Pi	peline

Soil temperature difference is similar to what would occur on the Project. No significant differences were noted in plant available soil water or crop yield at any site with the exception that mean plant available soil water was significantly greater over the trench in 2002 than in adjacent areas. Data were collected under the drought conditions that existed in 2002, while precipitation and plant available soil water were normal to above normal in 2003 and 2004, respectively. It was anticipated that soil temperatures above the pipe might lead to increased soil drying, however, this was not documented. Increased soil temperature above the pipeline did not significantly affect plant available soil water or crop yield.

iii. Seasonal pipeline temperature profile and effect on vegetation.

Temperature contours shown in **Figures 3** through **45** indicate natural fluctuations in soil temperatures by season and latitude. Heat from the pipeline typically increases soil temperature 6 inches below the surface between 5° and 8° F above background levels; greater differences occur between January and April, particularly in northern latitudes. Early season temperature differences at northern latitudes are between 10° and 15° F directly over the pipeline compared to background levels. Seasonal differences as a result of pipeline heat are not noticeable in Oklahoma and Texas.

Temperature contours (**Figures 3** to **33**) change dramatically throughout the year as air temperature and soil temperature interact. Although temperature differences are most noticeable in early to mid-spring, the area of maximum temperature difference is restricted to immediately over the pipeline (**Figures 3** and **4** and **8** and **9**). Later spring and summer temperature profiles indicate that average surface temperatures continue through the soil profile in a zone around the pipeline (**Figures 5** and **6** and **10** and **11**). Late fall temperature profiles indicate that pipeline heat has minimal effect on surface conditions (**Figures 7** and **12**). In summary, heat effects from the pipeline would have the greatest impact on surface conditions, and potentially plant growth, in early to mid-spring at northern latitudes.

The roots of most annual crops occur within 1.4 feet of the soil surface at maturity (Merrill et al. 2002). Heat effects from the pipeline are less pronounced within this zone than near the pipe. Also, many crops in northern latitudes are seeded in spring or early summer when heat effects from the pipeline would be minimized by ambient weather conditions. Consequently, root development of spring-seeded plants would occur after pipeline heat effects have substantially dissipated in the rooting zone. The roots of fall-seeded plants, such as winter wheat, would have initiated root growth prior to winter dormancy. The amount of root growth would depend on planting date, soil type, cultivar, and weather (Fowler 2002). Heat effects from the pipeline would be negligible since heat is directed into lower soil profiles in the fall. However, increased early to mid-spring soil temperatures could hasten dormancy emergence in fall-seeded crops such as winter wheat whose roots are already partially developed. Earlier emergence can improve crop yields as shown in **Table 1**.

Elevated soil temperatures could affect other crop physiological functions. Winter wheat requires two coldaffected physiological responses: cold acclimation and vernalization, to achieve dormancy, survive low winter temperatures, and subsequently develop. Cold acclimation and vernalization require a period of fall growth when temperatures are between 30° and 60° F, with 40°F near optimum. If cold acclimation is prevented, plants may be damaged or killed by low winter temperatures. Similarly, if vernalization is prevented, poor heading and flowering will occur in the spring. Eight to ten weeks at the above temperatures is typically required for full cold acclimation and dormancy to be achieved. Vernalization requires approximately 40 days, but can vary from 30 to 60 days depending upon the wheat variety (Fowler 2002).

Based on the pipeline thermal modeling results, surface soil temperatures in September and October (when winter wheat is typically seeded) is primarily a function of air temperature. Optimal winter wheat seeding depth is less than 1 inch (Fowler 2002). Consequently, soil temperatures during initial wheat germination and growth, cold acclimation, and vernalization would be influenced by ambient conditions. Heat generated by the pipeline would not be a factor in cold acclimation and vernalization. Similarly, throughout the winter, heat from the pipeline is directed into the lower soil profiles. Soil surface temperatures and wheat dormancy will be affected by ambient temperatures, not heat from the pipeline.

Although positive effects on vegetation would likely result from elevated soil temperatures in early to midspring, potentially negative effects could occur later in the summer if pipeline-influenced soil temperatures promoted soil drying in concert with higher air temperatures. Underground hot-water pipelines (95° F) have been shown to promote germination and early season plant growth, but also deplete available moisture (Rykbost et al. 1975a,b). While it is possible that elevated soil temperature may promote soil drying, it is difficult to separate the effects of soil temperature from the influence of soil structure, soil conductivity, and mycorrhizal function on soil water availability and plant uptake (Killham 1994). Warm soils absorb water faster than cold soils and therefore soil water may be more readily available to plants in warmer soils than in colder soils (Donohue et al. 1971). Rykbost (1975a, 1975b) found increased crop yields in heated soils with an irrigated water supply. However, most wet soils also evaporate water more quickly than do dry soils, which tend to promote soil cooling (http://www.Newton.dep.anl.gov). Consequently, although soils warmed by the pipeline may absorb more water and promote water infiltration, the greater amount of water moving through the trench could cool the trench soil profile more quickly than the surrounding soil, resulting in slower drying and a neutral impact on plant growth.

In summary, enhanced emergence and initial plant growth may be detected over the pipe centerline in early to mid-spring at northern latitudes since some plants are sensitive to increased soil temperatures during this stage of plant development. Positive or negative effects are unlikely to be measurable later in the growing season since post-emergent plant growth is more influenced by air temperature, day length, and soil moisture than soil temperature. While it is theoretically possible that heat from the pipeline may dehydrate soil moisture directly above the trench, the heated trench may absorb water more rapidly than adjacent soils. The additional water in the trench soil profile would then likely cool the soil more rapidly than in adjacent areas. Ultimately, the thermal effect of the pipeline on plant growth would typically be secondary to other environmental conditions as described in Section iv below.

iv. Land Management Practices Affect Soil Temperature

Although the pipeline will affect nearby soil temperatures, its impact will be confounded by surface land management practices. Crop rotation, grazing practices, and burning treatments influence soil temperature. Crop residues under different tillage systems and pasture utilization affect soil temperature by changing the degree of soil shading. Soil temperatures are often at least 2° F colder at 4-inch depth under cornstalk residue than on essentially bare soil (Mannering http://www.ces.purdue.edu/extmedia/AY/AY-230). Tillage systems were found to significantly affect soil temperature and corn emergence (Drury et al. 1999). Tillage systems also greatly affect soil moisture and soil fertility (Drury et al. 1999, Norwood 1999). Grazing and pasture burning influence soil temperatures by removing vegetation thereby decreasing shade and increasing evaporation. Studies in the tallgrass prairie indicate that burning, or burning and grazing in concert, increase soil temperatures by 20 to 50 percent over unburned and/or ungrazed areas (Knapp et al. 1998). Consequently, although heat generated by the pipeline will affect nearby soils and potentially vegetation, land management practices will greatly influence any measurable effect of the pipeline.

v. Revegetation Monitoring Results on Pipelines

Four years of revegetation monitoring were conducted on the 515-mile Express crude-oil pipeline in Montana and Wyoming. Specific success criteria were defined for native vegetation and Conservation Reserve Program (CRP) fields. Success criterion in native vegetation was defined as achieving 90 percent cover of desirable perennial species compared to adjacent areas within 5 years. Success criteria for CRP fields were defined as stable soils and comparable species composition to adjacent conditions. Following four years of monitoring, revegetation success in native vegetation types had been achieved on approximately 97 percent of the pipeline right-of-way and in all but two CRP fields (WESTECH Environmental Services 1998, 1999, 2000, 2001). After 8 years, all revegetated areas had achieved the success criteria (Larsen, pers. com.).

vi. Summary

Pipeline heat may influence spring growth and production. Positive effects of elevated soil temperature on plant emergence and production have been documented. Negative effects of elevated soil temperature on plant physiology have not been documented at the temperatures that would be generated by the pipeline. The limited number of studies that have been completed on the heat effects of pipelines on vegetation indicate neutral to positive effects. Accordingly, Keystone does not anticipate any significant overall effect to crops and vegetation associated with heat generated by the operating pipeline.

Negative impacts of pipeline construction on post-construction vegetation are typically due to factors other than heat generation including:

- Soil compaction from equipment operation;
- Pipeline trench subsidence;
- Mixed soil horizons/topsoil degradation;
- Poor seed bed preparation; and
- Poorly adapted species used in revegetation.

These types of impacts can be avoided or mitigated through the use of construction, reclamation, and revegetation Best Management Practices (BMPs). Keystone has developed specific construction, reclamation, monitoring, and operational BMPs to insure successful reclamation and revegetation as detailed in the Project Construction, Mitigation, and Reclamation Plan (**Appendix I**). These types of BMPs have been applied by industry partners on thousands of miles of pipelines throughout the United States and Canada and have resulted in successful reclamation of pipeline rights of way that is equivalent to the land capability of adjacent undisturbed areas.

References

- Berglund, D.R. and T.C. Helms. 2003. Soybean production. North Dakota State University Extension Service. A-250 @ www.ag.ndsu.nodak.edu.
- Bollero, G.A., D.G. Bullock, S.E. Hollinger. 1996. Soil temperature and planting date effects on corn yield, leaf area, and plant development. Agronomy Journal. 88(3): 385-390.
- Burgess, M.M. and S.L. Smith. 2001. Shallow ground temperatures. Bulletin of the Geological Survey of Canada. 547: 89-103.
- Culwell, D.C. 2007. Personal communication regarding revegetation of the 515-mile Express crude-oil pipeline. WESTECHWESTECH Environmental Services, Inc. Helena, Montana.
- Delucia, E.H., S.A. Heckathorn, T.A. Day. 1992. Effects of soil temperature on growth, biomass allocation and resource acquisition of *Andropogon gerardii*. New Phytologist. 120(4): 543-549.
- Dixon, R.K., G.T. Behrns, G.S. Cox, H.E. Garrett, J.E. Roberts, P.S. Johnson, and I.L. Sanders. ca 1980. Soil temperature, growth, and ectomycorrhizal relationships of *Quercus velutina* seedlings. www.ncrs.fs.fed.us/pubs/ch/ch03/CHvolume03page289.pdf
- Donahue, R.L., J.C. Schickluna, L.S. Robertson. 1971. *Soils an Introduction to Soils and Plant Growth.* Prentice-Hall Inc., Englewood Cliffs, New Jersey.
- Drury, C., C. Tan, T.W. Welacky, T.O. Oloya, A.S. Hamill, and S.E. Weaver. 1999. Red clover and tillage influence on soil temperature, water content and corn emergence. Agronomy Journal. 91: 101-108.
- Environment Canada, 1993. <u>Canada Terrestrial Ecoregions</u>. <u>http://atlas.nrcan.gc.ca/site/english/maps/archives/5thedition/environment/ecology/mcr4164</u>. 1:7,500,000 map.
- Fisher, D.A., D.F. Fisher, D.P. Fisher. 2000. Gas pipelines: are they a detriment or an enhancement for crops? Journal of the ASFMRA. <u>www.asfmra.org</u>.

- Fowler, D. B. 2002. Winter Wheat Production Manual. Crop Development Centre University of Saskatchewan, Saskatoon, Canada. Available at: <u>URL:http://www.usask.ca/agriculture/cropsci/winter_cereals/</u>
- Holmes, N.D., G.R. McNaughton, W.E. Phillips, J.G. Stothart and J. Willman. 1979. Alberta Farm Guide. Edmonton, AB. 336 p.

Kaspar, T.C. and W.L. Bland. 1992. Soil temperature and root growth. Soil Science 154(4): 290-299.

- Ketcheson, J.W. 1970. Effects of heating and insulation soil on corn growth. Soil Sci. 50: 379-384.
- Killham, K. 1994. Soil Ecology. Cambridge University Press. Cambridge, U.K.
- Knapp, A., S. Conard, and J. Blair. 1998. Determination of soil CO2 flux from a sub-humid grassland: effect of fire and fire history. Ecological Applications. 8(3): 760-770.
- Larsen, L. 2007. Personal communication regarding revegetation of the 515-mile Express crude-oil pipeline. WESTECH Environmental Services, Inc. Helena, Montana.
- Larson, M.M. 1974. Effects of temperature on early growth of oak seedlings. Ohio Agric. Res. And Dev. Cent. Research Summary 74. 10-13.
- Mannering, J.V. Value of crop rotation under various tillage systems. Purdue University Cooperative Extension Service. <u>http://www.ces.purdue.edu/extmedia/AY/AY-230</u>.
- McMaster, G.S., W.W. Wilhelm, D.B. Palic, J.R. Porter and P.D. Jamieson. 2003. Spring wheat leaf appearance and temperature: extending the paradigm? Annals of Botany 91: 697-705.
- McMichael, B.L. and J.J. Burke. 1998. Soil temperature and root growth. HortScience 33(6): 947-951.
- Merrill, S.D., D.L. Tanaka, and J.D. Hanson. 2002. Root Length Growth of Eight Crop Species in Haplustoll Soils. Soil Science Society of America Journal *66:913-923*.
- Naeth, M.A. 1985. Ecosystem reconstruction and stabilization following pipeline construction through Solonetzic native rangeland in southern Alberta, M.Sc. Thesis, University of Alberta, Edmonton. 196 pp.
- Naeth, M.A., D.S. Chanasyk, W.B. McGill and A.W. Bailey. 1993. Soil temperature regime in mixed prairie rangeland after pipeline construction and operation. Can. Agriculture Engineering. 35(2): 89-95.
- Parsons, J. 2001. Soil temperature. Horticulture Update. Extension Horticulture, Texas Agricultural Extension Service, College Station Texas.
- Riley, J.A. 1957. Soil temperature as related to corn yield in central Iowa. Monthly Weather Review. Weather Bureau Station Des Moines Iowa. 393-400.
- Rykbost, K.A.L. Boersma, H.J. Mack and W.E.Schmisseur. 1975a. Yield Response to Soil Warming: Agronomic Crops. Agronomy Journal 67(6):733-738.
- Rykbost, K.A.L. Boersma, H.J. Mack and W.E. Schmisseur. 1975b. Yield Response to Soil Warming: Vegetable Crops. Agronomy Journal 67(6):738-743.
- Seabloom, E.W., A.G. van der Valk, and K.A. Moloney. 1998. The role of water depth and soil temperature in determining initial composition of prairie wetland coenoclines. Plant Ecology. 138(2): 203-216.

- Scow, K. 2007. Personal communication regarding revegetation of the 515-mile Express crude-oil pipeline. WESTECH Environmental Services, Inc. Helena, Montana.
- Spencer, F.S. 1975. Plant growth over an underground power transmission prototype. Ontario Hydro Research Quarterly 27: 17-23.
- Stewart, A.J. and A.F. MacKenzie. 1979. Effect of pipeline construction on soils and crops. IV. Department of Renewable Resources, Macdonald College, Montreal, Quebec. 43 pp.
- Stone, P.J., I.B. Sorensen and P.D. Jamieson. 1999. Effect of soil temperature on phenology, canopy development, biomass and yield of maize in cool-temperature climate. Field Crops Research. 63(2): 169-178.
- TERA Environmental Consultants. 2004. Effects of heat from a pipeline on crop growth interim results. 8th Annual Environmental Concerns in Rights-of-Way Management Symposium in Saratoga Springs
- Teskey, R.O. 1978. Influence of temperature and moisture on root growth of white oak. M.S. Thesis, University of Missouri. 128 p.
- Teskey, R.O., and T.M. Hinckley. 1981. Influence of temperature and water potential on root growth of white oak. Physiologia Plantarum. 52(3): 363-369.
- Tyagi, S.K. and R.P. Tripathi. 1983. Effect of soil temperature on soybean germination. Plant and Soil. 74(2): 273-280.
- WESTECH Environmental Services, Inc. 1998. Express Pipeline Revegetation Monitoring Reports Montana and Wyoming.
- WESTECH Environmental Services, Inc. 1999 Express Pipeline Revegetation Monitoring Reports Montana and Wyoming.
- WESTECH Environmental Services, Inc. 2000. Express Pipeline Revegetation Monitoring Reports Montana and Wyoming.
- WESTECH Environmental Services, Inc. 2001. Express Pipeline Revegetation Monitoring Reports Montana and Wyoming.

www.ces.ncsu.edu/disaster/drought. Managing drought-stressed soybeans in the southeast.



United States Department of the Interior



FISH AND WILDLIFE SERVICE Colorado Ecological Services

IN REPLY REFER TO: FWS/R6/ES CO Front Range: Post Office Box 25486 Mail Stop 65412 Denver, Colorado 80225-0486 Western Slope: 445 W. Gunnison Avenue Suite 240 Grand Junction, Colorado 81501-5711

September 30, 2019

Chris Boone Bureau of Land Management 5001 Southgate Drive Billings MT. 59101

Chris,

This letter acknowledges the U.S. Fish and Wildlife Service's (Service) receipt of your September 30, 2019 letter requesting initiation of formal Section 7 consultation under the Endangered Species Act. The consultation concerns the potential effects of the Keystone XL Pipeline Project in Montana, South Dakota, and Nebraska on the American Burying Beetle.

It is our understanding that all information required of you to initiate consultation was either included in your letter or is otherwise accessible for our consideration or reference. We have assigned TAILs number 06E2400-2019-1298 to this consultation. Please refer to that number in future correspondence on this consultation.

Section 7 allows the Service up to 90 calendar days to conclude formal consultation with your agency and an additional 45 calendar days to prepare our biological opinion (unless we mutually agree to an extension). Therefore, we expect to provide you with our Biological Opinion no later than February 12, 2020.

As a reminder, the Endangered Species Act requires that after initiation of formal consultation, the Federal action agency may not make any irreversible or irretrievable commitment of resources that limits future options. This practice insures agency actions do not preclude the formulation or implementation of reasonable and prudent alternatives that avoid jeopardizing the continued existence of endangered or threatened species or destroying or modifying their critical habitats.

Should you have any questions, please contact Drue DeBerry, Colorado and Nebraska Ecological Services Field Offices Supervisor at (303) 236-4774 or <u>drue deberry@fws.gov</u>.

Sincerely,

4 6 4

Drue DeBerry Colorado and Nebraska Field Supervisor U.S. Fish and Wildlife Service/ Ecological Services

Cc:

Jim Douglas, Director, Nebraska Game and Parks Commission, Lincoln, NE Martha Williams, Director, Montana Fish, Wildlife, and Parks, Helena, MT Kelly Hepler, Department Secretary, South Dakota Game, Fish, and Parks, Pierre, SD Jim Stobaugh National Project Manager, Bureau of Land Management, Reno, NV Matt Marsh, Western Area Power Authority, Upper Great Plains Regional Office, Billings, MT Heath Kruger, U.S. Army Corps of Engineers, Omaha District Dennis Rankin, U.S. Department of Agriculture, Rural Utility Service, Washington, DC Mark R. Alliston, U.S. Department of State, Washington, DC