NEBRASKA
— GAME PARKS —

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641

March 13, 2017

RECEIVED
MAR 16 2017
Natural Gas Dept.

Matthew J. Effken
Nebraska Public Service Commission
1200 N Street
The Atrium, Suite 300
Lincoln, NE 68508

RE: Application of TransCanada Keystone Pipeline, L.P.: Docket No. OP-0003

Dear Mr. Effken:

This is in response to your letter dated February 17, 2017 regarding the application TransCanada Keystone Pipeline, L.P. (TransCanada) filed with the Nebraska Public Service Commission. Nebraska Game and Parks Commission (NGPC) staff have reviewed the application for the Keystone XL Pipeline (Pipeline) and we offer the following comments.

NGPC staff members have been involved in reviewing the Pipeline project since 2008. We have provided extensive comments on the project through various letters, meetings and conference calls. Our comments focused on potential impacts to resources of our agency's concern, such as fish and wildlife, state-listed endangered and threatened species, natural habitats (e.g., streams, wetlands and grasslands) and NGPC properties. Recommendations NGPC staff members provided for avoiding, minimizing and mitigating impacts to these resources were evaluated and incorporated as part of the Environmental Impact Statement, Supplemental Environmental Impact Statement, Biological Assessment and Biological Opinion documents associated with this project.

TransCanada's application specifically references the Biological Opinion (BO) issued by the U.S. Fish and Wildlife Service in 2013, and the Final Supplemental Environmental Impact Statement (FSEIS) issued by the Department of State in 2014. These documents (BO and FSEIS) include an extensive set of conservation measures, which will be implemented in order to avoid and minimize impacts on species and their habitats. The documents also outline mitigation requirements for unavoidable impacts to such resources.

Since issuance of the BO and FSEIS, rufa red knot (*Calidris canutus rufa*) and northern long-eared bat (*Myotis septentrionalis*) were listed as threatened under the Endangered Species Act (ESA). With the inclusion of these species on the federal endangered and threatened species list, they automatically became state-listed species [Neb. Rev. Stat. §37-806(1)] and now receive protection under the Nebraska Nongame and Endangered Species Conservation Act (NESCA) (Neb. Rev. Stat. §§37-801 to 37-811). The conservation measures in place for whooping crane, interior least tern and piping plover will also serve to protect rufa red knot. TransCanada, U.S. Department of State, U.S. Fish and Wildlife

Service and NGPC staff discussed appropriate conservation measures for northern long-eared bat after it was listed as threatened. These conservation measures are currently being formalized and will be implemented in order for TransCanada to comply with both ESA and NESCA.

The U.S. Fish and Wildlife Service is currently responding to various petitions to list additional species as endangered or threatened under ESA. As stated above, if at any time a species is listed under ESA, it will automatically become listed under NESCA. At such time, additional surveys, conservation measures and mitigation may be required in order for the Pipeline project to comply with NESCA.

At this time, we do not anticipate the need for additional information regarding our agency's resources of concern along the Pipeline route. If the Public Service Commission determines a report is needed, we will submit survey results and information, which have already been conducted and prepared by TransCanada. Therefore, we are not submitting a budget for preparation of such reports.

Thank you for the opportunity to review the Pipeline application. If you have questions about these comments or require additional information, please contact Michelle Koch at (402) 471-5438 or michelle.koch@nebraska.gov.

Sincerely,

James Douglas
Director

cc: Michelle Koch, NGPC
Eliza Hines, USFWS

NEBRASKA
— GAME PARKS —

2200 N. 33rd St. • P.O. Box 30370 • Lincoln, NE 68503-0370 • Phone: 402-471-0641

June 15, 2017

Mr. Tim Schram, Chair
Nebraska Public Service Commission
300 The Atrium, 1200 N Street
P.O. Box 94927
Lincoln, NE 68508

RE: Reports for Application of TransCanada Keystone Pipeline, L.P.: Docket No. OP-0003

Dear Mr. Schram:

In a letter dated May 23, 2017, the Nebraska Public Service Commission requested survey results and other information from the Nebraska Game and Parks Commission pertaining to the TransCanada Keystone XL Pipeline Project (Pipeline). We are hereby providing the information as requested for the Nebraska Public Service Commission to review and consider pursuant to the Nebraska Major Oil Pipeline Siting Act, *Neb. Rev. Stat. §§ 57-1401 – 57-1413.*

The documents and reports provided contain information regarding: (1) the evaluation of potential impacts the Pipeline may have on state-listed endangered and threatened species; (2) conservation measures to avoid and minimize negative impacts on listed species; (3) mitigation strategies to offset impacts which are unavoidable; and (4) specific survey results used to evaluate potential impacts and develop appropriate conservation and mitigation measures.

The Biological Assessment, Biological Assessment Errata, Biological Opinion, Requests for Reinitiation, and select chapters of the Final Supplemental Environmental Impact Statement are publically available on the U.S. Department of State's website for the Keystone XL Pipeline Project. Hard copies of the pertinent parts of these documents are included in fulfillment of this request, and do not contain confidential or sensitive information. Some of the information contained in these documents was included in the application TransCanada submitted to the Nebraska Public Service Commission.

The summaries of special status species searches and survey results contain sensitive information, which is not available to the public. We respectfully request such information remain confidential in order to protect landowners who may have these species on their properties, and in order to protect the species themselves.

The Nebraska Game and Parks Commission appreciates the opportunity to be involved in the Pipeline application process. If you have questions about these documents or require additional information, please contact Michelle Koch at (402) 471-5438 or michelle.koch@nebraska.gov

Sincerely,

James Douglas
Director

cc: Michelle Koch, Nebraska Game and Parks Commission

Enclosures (13)

1) 2012 Biological Assessment Errata
2) Final Biological Assessment for the Keystone XL Project, Volume I (December 21, 2012)
3) U.S. Fish and Wildlife Service Biological Opinion with Appendices A-G (May 15, 2013)
4) Request for Reinitiation of Section 7(a)(2) for the TransCanada Keystone XL Pipeline Project and Concurrence with Findings (August 27, 2015)
5) Request for Reinitiation of Section 7(a)(2) for the TransCanada Keystone XL Pipeline Project (March 16, 2017)
6) Final Supplemental Environmental Impact Statement – Chapter 3 Affected Environment – Section 3.8 Threatened and Endangered Species and Species of Conservation Concern
7) Final Supplemental Environmental Impact Statement – Chapter 4 Environmental Consequences – Section 4.8 Threatened and Endangered Species and Species of Conservation Concern
8) Summary of 2011 Federally-Listed Species Searches for the Keystone XL Pipeline Project Steele City Segment (Montana, South Dakota, and Nebraska) (July 2011)
9) Summary of 2012 Special Status Species Searches for the Keystone XL Pipeline Project Nebraska Reroute (August 2012)
10) Western Prairie Fringed Orchid Habitat Acreage by County and Habitat Quality Rating and associated email (July 30, 2013)
11) Summary of August 2011 American Burying Beetle Trap and Relocate Efforts in Nebraska for the Keystone XL Pipeline Project – Steele City Segment (September 2011)
12) Hoback August Survey Report – Results of Survey fo American Burying Beetle, *Nicrophorus americanus*, in Northern Keya Paha, Western Boyd, and Eastern Holt and Antelope Counties (September 12, 2012)
13) Summary of Habitat and Potential Impacts and Conservation Measures for Northern Long-Eared Bat on the Proposed Keystone XL Pipeline Project (April 2014)

2012 BIOLOGICAL ASSESSMENT ERRATA

As of December 30, 2013, the following errata and clarifications to the 2012 Biological Assessment for the proposed Keystone XL Project are presented in Table 1.

Table 1. Errata and Clarifications

Page	Errata and Clarifications
	Note: Differences in the original text and the amendment are highlighted in gray.
	Amendment Discussion Keystone provided new information to the Department concerning the Bakken Marketlink Project. The Bakken Marketlink Project no longer includes one of the three new previously proposed storage tanks. The 100,000-barrel tank was proposed as a diversion tank to facilitate batch injections into the Keystone XL system. Based on recent engineering studies, it has been concluded that the pipeline can be operated without a diversion tank while maintaining a desirable pressure profile and maintaining batch quality. Accordingly, the 100,000-barrel tank and associated facilities have been removed from the Bakken Marketlink design.
1.0-7	**Original Text** Construction and operation of the Bakken Marketlink Project would include metering systems, a five-mile pipeline segment (route not yet determined), three new storage tanks near Baker, Montana. The known distribution of the greater sage-grouse and interior least tern would not overlap with pipelines or storage tanks proposed under this connected action. In addition, the Bakken Marketlink facilities near Baker would not likely affect the whooping crane as this region is not within the whooping crane migration corridor. However, the Bakken Marketlink facilities would be constructed in a region used by Sprague's pipit. Additional federally protected or candidate species may occur within the area where Bakken Marketlink Project activities would occur. **Amendment** Construction and operation of the Bakken Marketlink Project would include metering systems, a five-mile pipeline segment (route not yet determined), and two new storage tanks near Baker, Montana. The known distribution of the greater sage-grouse and interior least tern would not overlap with pipelines or storage tanks proposed under this connected action. In addition, the Bakken Marketlink facilities near Baker would not likely affect the whooping crane as this region is not within the whooping crane migration corridor. However, the Bakken Marketlink facilities would be constructed in a region used by Sprague's pipit. Additional federally protected or candidate species may occur within the area where Bakken Marketlink Project activities would occur.
	Amendment Discussion Acreages provided in the text below and within Tables 3.1-3 and 3.1-5 for estimated American burying beetle habitat acreage impacts for South Dakota and Nebraska, respectively, were based on permanent impact numbers from pipeline ROW at 50 feet, not the 22-foot corridor as described in the text. Permanent and temporary acreage impacts are updated based on the 22-foot permanent corridor. Footnotes and a note were added to the tables to explain temporary and permanent impacts.
3.0-39	**Original Text** As shown in Table 3.1-3, 220 acres of American burying beetle habitat in South Dakota would be permanently impacted from various proposed Project facilities (160 acres prime, 48 acres good, 0 acres fair, and 12 acres marginal). Temporary impacts to American burying beetle habitat from proposed Project construction activities in South Dakota would be 408 acres. Of the acres impacted, approximately 208 acres of prime and good habitat would be permanently impacted from various proposed Project facilities, and 310 acres of prime and good habitat would be temporarily impacted from Project facilities in South Dakota.

Page	Errata and Clarifications

Amendment

As shown in Table 3.1-3, 102 acres of American burying beetle habitat in South Dakota would be permanently impacted from various proposed Project facilities (76 acres prime, 21 acres good, 0 acres fair, 5 acres marginal and 0 acres poor). Temporary impacts to American burying beetle habitat from proposed Project construction activities in South Dakota would be 526 acres. Of the acres impacted, approximately 97 acres of prime and good habitat would be permanently impacted from various proposed Project facilities, and 422 acres of prime and good habitat would be temporarily impacted from Project facilities in South Dakota.

3.0-40 Original Text

Table 3.1-3 South Dakota American Burying Beetle Habitat Suitability Acreage

Permanent Impact	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW)	0.00	12.13	0.00	48.50	150.32
Pump Stations	0.00	0.00	0.00	0.00	8.42
Permanent Access Road Easement	0.00	0.00	0.00	0.00	1.27
Total Acres	**0.00**	**12.13**	**0.00**	**48.50**	**160.01**
Temporary Impact					
Temporary Easement (CL ROW)	0.00	14.17	0.00	57.84	179.07
Additional Temporary Workspace (CL ROW)	0.00	3.37	0.00	10.80	30.91
Auxiliary Site	0.00	0.00	80.01	0.00	29.50
Temporary Access Road Easement	0.00	0.20	0.00	0.00	2.28
Total Acres	**0.00**	**17.74**	**80.01**	**68.64**	**241.75**

CL ROW = centerline of the right-of-way.

Amendment

Table 3.1-3 South Dakota American Burying Beetle Habitat Suitability Acreage

Permanent Impact[a]	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW)	0.00	5.34	0.00	21.34	66.14
Pump Stations	0.00	0.00	0.00	0.00	8.42
Permanent Access Road Easement	0.00	0.00	0.00	0.00	1.27
Total Acres	**0.00**	**5.34**	**0.00**	**21.34**	**75.83**
Temporary Impact[b]					
Temporary Easement (CL ROW)	0.00	20.96	0.00	85.00	263.25
Additional Temporary Workspace (CL ROW)	0.00	3.37	0.00	10.80	30.91
Auxiliary Site	0.00	0.00	80.01	0.00	29.50
Temporary Access Road Easement	0.00	0.20	0.00	0.00	2.28
Total Acres	**0.00**	**24.53**	**80.01**	**95.80**	**325.94**

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline (see *Operation of the Project* subsection, below).
[b] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.

CL ROW = centerline of the ROW.

3.0-41 Original Text

As shown on Table 3.1-5, approximately 372 acres of American burying beetle habitat would be permanently impacted in Nebraska from the proposed Project. Of the 372 acres impacted, about 140

Page	Errata and Clarifications

acres are considered prime habitat, 97 acres good, 0 acres fair, and 63 acres marginal.

Amendment

As shown on Table 3.1-5, approximately 171 acres of American burying beetle habitat would be permanently impacted in Nebraska from the proposed Project. Of the 171 acres impacted, about 61 acres are considered prime habitat, 42 acres good, 0 acres fair, 36 acres marginal and 32 acres poor.

3.0-42 Original Text

Table 3.1-5 Estimated American Burying Beetle Habitat Acreage Impacts in Nebraska

Permanent Impact	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW)	72.73	48.48	0.00	96.51	139.70
Pump Stations	0.05	14.99	0.00	0.00	0.00
Permanent Access Road Easement	0.00	0.00	0.00	0.00	0.00
Total Acres	**72.78**	**63.47**	**0.00**	**96.51**	**139.70**
Temporary Impact					
Temporary Easement (CL ROW)	87.27	56.51	0.00	115.73	165.02
Additional Temporary Workspace (CL ROW)	5.63	3.84	0.00	9.75	16.64
Auxiliary Site[a]	104.62	30.10	0.00	33.36	90.65
Temporary Access Road Easement[a]	0.00	5.08	13.44	13.70	15.02
Total Acres	**197.52**	**95.53**	**13.44**	**172.54**	**287.34**

[a] Includes potential site locations in Spread 8.

CL ROW = centerline of right-of-way.

Amendment

Table 3.1-5 Estimated American Burying Beetle Habitat Acreage Impacts in Nebraska

Permanent Impact[a]	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW)	32.00	21.33	0.00	42.46	61.47
Pump Stations	0.05	14.99	0.00	0.00	0.00
Permanent Access Road Easement	0.00	0.00	0.00	0.00	0.00
Total Acres	**32.05**	**36.32**	**0.00**	**42.46**	**61.47**
Temporary Impact[b]					
Temporary Easement (CL ROW)	128.00	83.66	0.00	169.78	243.25
Additional Temporary Workspace (CL ROW)	5.63	3.84	0.00	9.75	16.64
Auxiliary Site[c]	104.62	30.10	0.00	33.36	90.65
Temporary Access Road Easement[c]	0.00	5.08	13.44	13.70	15.02
Total Acres	**238.25**	**122.68**	**13.44**	**226.59**	**365.57**

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline (see *Operation of the Project* subsection, below).
[b] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.
[c] Includes potential site locations in Spread 8.

CL ROW = centerline of the ROW.

Note: Excellent habitat does not always support ABB. In Nebraska, the species has not been captured in traps placed in habitats rated poor or marginal and only very rarely have they been captured in habitats rated fair. Areas that are rated as marginal or less are considered unsuitable to sustain ABB.

United States Department of State
Bureau of Oceans and International
Environmental and Scientific Affairs

Final Biological Assessment

for the

Keystone XL Project

Volume I

December 21, 2012

Applicant for Presidential Permit: TransCanada Keystone Pipeline, LP

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Prepared for:

Keystone XL Project

Keystone XL Project
Final Biological Assessment

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Acronyms and Abbreviation

APLIC	Avian Power Line Interaction Committee
AWBP	Aransas-Wood Buffalo National Park
BA	Biological Assessment
bcf/ day	billion cubic feet per day
BLM	Bureau of Land Management
BMP	best management practice
bpd	barrels per day
CAFOs	concentrated animal feeding operations
CEA	cumulative effects analysis
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CL ROW	centerline of the right-of-way
CMRP	Construction, Mitigation, and Reclamation Plan
CVA	Central Valley Agriculture
CWS	Canadian Wildlife Service
Department	U.S. Department of State
DOH	Department of Health
DPHHS	Department of Public Health and Human Services
Dth/ day	decatherms per day
EIS	Environmental Impact Statement
EO	Executive Order
ERP	Emergency Response Plan
ESA	Endangered Species Act
FR	Federal Register
GIS	geographical information system
HDD	horizontal directional drill
IBA	important bird area
Keystone	TransCanada Keystone Pipeline, LP
km	kilometer
KMIGT	Kinder-Morgan Interstate Gas Transmission
kV	kilovolt

LA	local area
MALAA	may affect, likely to adversely affect
MBCB	Montana Building Code Bureau
MBTA	U.S. Migratory Bird Treaty Act
MDEQ	Montana Department of Environmental Quality
MDT	Montana Department of Transportation
MDU	Montana-Dakota Utilities
MFWP	Montana Fish, Wildlife, and Parks
MLV	main line valve
MMcf/d	million cubic feet per day
MOP	maximum operating pressure
MP	milepost
MVA	million volt-amperes
MW	megawatt
NA	not applicable
NCRC	Nebraska Central Railroad Company
NNRC	Nebraska Northeastern Railway Company
NDEQ	Nebraska Department of Environmental Quality
NDHHS	Nebraska Department of Health and Human Services
NEPA	National Environmental Policy Act
NE SFM	Nebraska State Fire Marshal
NGPC	Nebraska Game and Parks Commission
NLAA	may affect, not likely to adversely affect
NMFS	National Marine Fisheries Service
NPPD	Nebraska Public Power District
NRC	National Response Center
NRCS	Natural Resources Conservation Service
OCC	Operations Control Center
OPS	Office of Pipeline Safety
PA	project area
PCIC	project cumulative impact corridor
PHMSA	Pipeline Hazardous Material Safety Administration
PPD	Public Power District

PPH	Preliminary Priority Habitat
Project	Keystone XL Pipeline Project
PS	pump station
PSRP	Pipeline Spill Response Plan
R	Regional
REX-W	Rockies Express-West
ROW	right-of-way
RPMA	Recovery-Priority Management Area
SCADA	Supervisory Control and Data Acquisition
SDDENR	South Dakota Department of Environment and Natural Resources
SD DOT	South Dakota Department of Transportation
SDGFP	South Dakota Game, Fish, and Parks
SPCC	Spill Prevention, Control, and Countermeasure
TBD	to be determined
TWA	temporary work area
U.S.	United States
USC	U.S. Code
UP	Union Pacific Railroad Company
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

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1.0 INTRODUCTION

1.1 SECTION 7 ESA PROCESS

The United States Department of State (Department) is the lead federal agency for the initial evaluation of anticipated impacts of TransCanada Keystone Pipeline, LP's (Keystone) proposed Keystone XL Pipeline Project (Project) on federally protected and candidate species and federally designated critical habitat. Federal agencies, in consultation with the United States Fish and Wildlife Service (USFWS), are required to ensure that any action they authorize, fund, or carry out does not result in the jeopardy to federally protected and candidate species or result in the destruction or adverse modification to federal designated critical habitat.

When a proposed federal action may affect a federally protected species, Section 7(c) of the Endangered Species Act (ESA) requires consultation with the USFWS, and a Biological Assessment (BA) is required if protected species or their critical habitat may be present in the area affected by any aspect of the proposed Project. An in-depth review was performed for the proposed Project components (i.e., Project centerline right-of-way [ROW] and aboveground facilities). A preliminary analysis of connected actions, such as transmission lines, was also conducted.

1.2 CONSULTATION HISTORY

Construction and operation of the proposed Project may affect habitats and populations of species protected under the federal ESA and by individual state legislation. In 2008, the Department appointed Keystone and its subcontractors to act as its designated non-federal representatives for Section 7 ESA consultation with respect to Keystone's Presidential Permit application for the previous proposed Keystone XL Project. In April 2008, Keystone, on behalf of the Department, initiated consultation with the USFWS, Bureau of Land Management (BLM), and state agencies to identify species and habitats of concern. No National Marine Fisheries Service (NMFS) listed species were determined to be within the proposed Project area. After meeting with USFWS, BLM, and state agencies, lists of species and habitats potentially affected by the proposed Project were compiled for further analysis. 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 for the previous proposed Project.

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 has since filed a new Presidential Permit application with the Department (May 2012). In June

2012, the Department initiated 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. 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 under construction. The proposed Project encompasses the former "Steele City" segment of the previous proposed Project and is the subject of this BA.

The Project through Montana and South Dakota is essentially the same as that reviewed and assessed in the previous 2011 BA and 2011 Biological Opinion for the previous proposed Project. Keystone will also use a 60-acre pipe yard in North Dakota. This 2012 BA covers federally protected and candidate species and updated proposed Project information.

Biological field surveys within the proposed Keystone XL Project footprint (e.g., pipeline ROW, pump stations, access roads, pipe yards, contractor yards, extra workspace, etc.) were initiated in spring 2008. These surveys were conducted along the centerline and filed with the Department in November 2008. Additional surveys along the ROW have continued every year through the summer of 2012, to take account of route alignment modifications, additional survey access permissions granted by private landowners, and additional agency requests for surveys. If necessary, additional species-specific field surveys will be conducted prior to proposed Project construction, in coordination with the appropriate agencies.

The following list provides a summary of Keystone's agency correspondence, species-specific survey information, and continued consultation with the USFWS since 2008 regarding coordination of biological surveys and determination of biological impacts for the proposed Project. This summary lists consultation relevant to Montana, South Dakota, and Nebraska:

- April 2008, Multiple Agencies: Keystone sent initial consultation 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 consultation 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 Project, and approximate mileposts where potential habitat was identified along the ROW.
- May 5, 2008, USFWS/Nebraska Game and Parks Commission (NGPC): 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 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 protocol and best management practices (BMPs) documents for future agency verification.

- May 8, 2008, USFWS/Montana Fish, Wildlife, and Parks (MFWP): 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 Project area. 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 Department of 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 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.
- 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 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 consultation 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.
- 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 consultation package. The USFWS and SDGFP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- February 3, 2009, BLM/MFWP: 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. 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 consultation package. The BLM and MFWP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- February 5, 2009, BLM: 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. 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 consultation package. The BLM provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.
- February 19, 2009, USFWS/NGPC: 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 consultation 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 C. 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.
- March 2, 2010, USFWS: Keystone held a conference call with USFWS on threatened and endangered and United States Migratory Bird Treaty Act (MBTA) Surveys. The goal of the call was to discuss helicopter survey windows for raptors/rookeries and bald eagles in 2010. The need for conducting additional pedestrian surveys for piping plovers was also discussed.
- September 3, 2010, Multiple Agencies: A meeting was held between USFWS, Keystone, the Department, and Cardno ENTRIX regarding the Section 7 ESA formal consultation for the Keystone XL Pipeline Project.
- September 9, 2010, Multiple Agencies: A meeting was held between USFWS, BLM, and Keystone regarding mitigation and construction stipulations for greater sage-grouse.
- October 12, 2010, Multiple Agencies: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA formal 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 Biological Assessment.
- January 12, 2011, Multiple Agencies: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 formal consultation on the American burying beetle.
- February 2, 2011, Multiple Agencies: Meetings continued between USFWS, Keystone, the Department, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA formal consultation on the American burying beetle.
- February 17, 2011, USFWS and the Department: A meeting was held between USFWS, the Department, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's Section 7 ESA formal consultation on the American burying beetle.

- March 24, 2011, USFWS, Keystone, the Department, NGPC: Meetings continued between USFWS, NGPC, Keystone XL, and the Department regarding the Keystone XL Pipeline Project's Section 7 ESA formal consultation on the American burying beetle.
- April 21, 2011, Keystone and the Department: Meetings continued regarding the Keystone XL Pipeline Project's Section 7 ESA formal consultation on the American burying beetle.
- April 27, 2011, USFWS and the Department: Meetings continued regarding the Keystone XL Pipeline Project's Section 7 ESA Formal Consultation on the American burying beetle. USFWS and the Department discussed monitoring and habitat restoration bonding.
- May 19, 2011: The Department submitted the 2011 BA to the USFWS with a letter requesting initiation of formal consultation.
- August 26, 2011: The Department issued the Final Environmental Impact Statement (Final EIS) to cooperating agencies and the public.
- September 6, 2011: 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.
- December 20, 2011: The Department requested that the USFWS withdraw their 2011 Biological Opinion for the proposed Keystone XL Project.
- December 21, 2011: 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 (MDEQ), MFWP: Discussion between USFWS, the Department, BLM, MDEQ, MFWP on the proposed Keystone XL Project to discuss project status and schedule.
- July 6, 2012, USFWS, the Department, BLM: Meetings continued regarding the Section 7 ESA consultation for the proposed Project application.
- August 28, 2012: 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.
- September 7, 2012: Keystone submitted the TransCanada Keystone XL Pipeline Project Environmental Report to the Department with an applicant-prepared Draft BA.
- September 28, 2012: USFWS submitted a Technical Assistance letter for the proposed Project with a list of species that may occur in the proposed Project area.
- October 9, 2012, USFWS, the Department, Keystone, BLM, NGPC, NDEQ, MFWP: 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.
- October 10, 2012, USFWS, Department, Keystone, BLM, NGPC, NDEQ, MFWP: 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.

- October 23, 2012, USFWS, Department, SDGFP, BLM, Keystone: 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.

Supporting meeting summaries, consultation letters, and communications are located in the 2011 Final EIS. Based on the consultation with state agencies, BLM, and the USFWS from 2008 to 2012, Keystone was able to refine the proposed biological surveys and survey requirements and avoidance, minimization, and compensation strategies for each species that may potentially be affected by the proposed Project. That information is presented in this BA.

1.3 ANALYSIS SUMMARY

This analysis addresses 13 federally protected or candidate species that were identified by the Department, the USFWS and state wildlife agencies as potentially occurring in the proposed Project area. On August 28, 2012, the Department submitted a species list of federally protected and candidate species and federally designated critical habitat to USFWS for the proposed Project area. Table 1.3-1 summarizes these species and the preliminary impact determinations based on: 1) correspondence with the USFWS, BLM, and state wildlife agencies; 2) habitat requirements and the known distribution of these species within the proposed Project area; and 3) habitat analyses and field surveys that were conducted for these species from 2008 through 2012. Potential impacts associated with electrical infrastructure required for the proposed Project are based on the 2008 through 2012 biological surveys where available.

Table 1.3-1 Summary of Species Included in Analysis and Findings

Common Name	Scientific Name	Federal Status	Detailed Analysis Included	Findings Summary[1, 2]
Mammals				
Black-footed ferret	*Mustela nigripes*	Endangered/Experimental Populations	Yes	NLAA/NLAA
Gray wolf	*Canis lupus*	Endangered/ Experimental Populations	No	No Effect/ No Effect
Birds				
Eskimo curlew	*Numenius borealis*	Endangered	No	No Effect
Greater sage-grouse	*Centrocercus urophasianus*	Candidate	Yes	NLAA
Interior least tern	*Sternula antillarum*	Endangered	Yes	NLAA
Piping plover	*Charadrius melodus*	Threatened	Yes	NLAA
Sprague's pipit	*Anthus spragueii*	Candidate	Yes	NLAA

Common Name	Scientific Name	Federal Status	Detailed Analysis Included	Findings Summary[1, 2]
Whooping crane	*Grus americana*	Endangered	Yes	NLAA
Fish				
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	Yes	NLAA
Topeka shiner	*Notropis topeka*	Endangered	No	No Effect
Invertebrates				
American burying beetle	*Nicrophorus americanus*	Endangered	Yes	MALAA
Plants				
Blowout penstemon	*Penstemon haydenii*	Endangered	No	No Effect
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	Yes	NLAA

[1] NLAA – May affect, not likely to adversely affect.

[2] MALAA – May affect, likely to adversely affect.

1.3.1 Connected Actions

The proposed Project would also include several connected actions including: (1) the Bakken Marketlink Project; (2) the Big Bend to Witten 230-kV Transmission Line; and (3) Electrical Distribution Lines and Substations. These connected actions are described briefly here.

1.3.1.1 Bakken Marketlink Project

Construction and operation of the Bakken Marketlink Project would include metering systems, a five-mile pipeline segment (route not yet determined), three new storage tanks near Baker, Montana. The known distribution of the greater sage-grouse and interior least tern would not overlap with pipelines or storage tanks proposed under this connected action. In addition, the Bakken Marketlink facilities near Baker would not likely affect the whooping crane as this region is not within the whooping crane migration corridor. However, the Bakken Marketlink facilities would be constructed in a region used by Sprague's pipit. Additional federally protected or candidate species may occur within the area where Bakken Marketlink Project activities would occur.

1.3.1.2 Big Bend to Witten 240-kV Transmission Line

The Big Bend to Witten 230-kV Transmission Line would provide upgrades to the power grid to support power requirements for pump stations in South Dakota. Federally protected and candidate species may occur where the transmission lines and associated poles/towers would be constructed.

1.3.1.3 Electrical Distribution Lines and Substations

The third connected action is associated with the electrical distribution lines and substations that would be required throughout the length of the proposed Project corridor to support pump stations and other integral Project-related ancillary facilities.

The Rural Utilities Service (an agency within the United States Department of Agriculture) and the Western Area Power Administration (an agency of the United States Department of Energy) would consult with USFWS when a proposed federal project may affect a federally protected (listed) species and/or federally designated critical habitat. Such circumstances routinely occur during the course of planning for routing and construction procedures for electrical power lines. Although power providers are dealing directly with USFWS on threatened and endangered species issues and consulting with the USFWS regarding ways to minimize or mitigate impacts to threatened and endangered species affected by construction and new distribution lines to the pump stations, potential impacts and conservation measures for distribution lines are presented within this 2012 BA. Agreements received from power providers concerning their intent to consult with USFWS are included in Appendix A (Letters of Section 7 Consultation Commitments from Power Providers).

Electrical power for the proposed Project would be obtained from local power providers. These power providers would construct the necessary substations and transformers and would either use existing service lines or construct new service lines to deliver electrical power to the specified point of use. The electrical power providers would be responsible for obtaining the necessary permits, approvals, or authorizations from federal, state, and local governments.

Most of the proposed new electrical distribution lines to service pump stations would be 115-kV lines strung on a single-pole and/or H-frame wood poles. The poles would typically be about 60 to 80 feet high with wire span distances of about 250 to 400 feet. 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.

The spill risk to a species is based upon the length of pipeline crossing its migration habitat/habitat and the spill risk incident rate as described in Section 4.14 of the draft Supplemental Environmental Impact Statement. For example, based upon a 119 mile pipeline segment that passes through native grass prairie for the Sprague pipits' habitat and an incident spill risk of 0.00025 incident/ mile-year, the estimated spill risk occurrence within the habitat is 34 years or 0.030 incidences per year. For other species along the Proposed route, the distance of a species habitat crossed by the Proposed project route is less than that crossed for the Spraque pipits' habitat; therefore, the spill risk occurrence for these other species is lower than the 0.030 incidents per year (i.e., more than 34 years before an incident occurs).

Spill volume cannot be predicted for any species mitigation habitat/habitat; however, because 80% of historical spill volumes are less than 50 barrels (bbls), the probable spill volume could be less than 50 bbls which could result in a radial impact from the pipeline of up to 112 feet (34.1 meters)(U.S. Department of State 2012).

1.4 SUMMARY OF SPECIES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

Four federally protected or candidate species initially identified as potentially occurring within the proposed Project area were evaluated during consultation, but were eliminated from detailed analysis based on further review of the location of the proposed Project relative to known species distributions, habitat important to the species, or additional information provided by federal or state agencies.

1.4.1 Gray Wolf - Endangered/Experimental Populations

The gray wolf (*Canis lupus*) was once found throughout much of the continental United States. Gray wolves are currently listed as Endangered in South Dakota and Nebraska, and were delisted in Montana in May 2011. One gray wolf was killed in Spalding, Nebraska, in 2002 and was determined to be a dispersing male from Minnesota (USFWS 2003). Prior to 2002, a wolf had not been sighted in Nebraska since 1913 (USFWS 2003). There are no known populations of gray wolves in South Dakota (USFWS 2012a). Some wolves that disperse from Yellowstone National Park have occasionally been found in western South Dakota, but sightings are infrequent, with only three wolves recorded in recent years (The Wildlife News 2012). Since there are no populations of gray wolves in South Dakota or Nebraska, and since the species is no longer listed in Montana, the gray wolf was eliminated from detailed analysis.

1.4.2 Eskimo Curlew - Endangered

The endangered Eskimo curlew (*Numenius borealis*) historically migrated through the proposed Project area in Nebraska. The Eskimo curlew was reliant on wet meadow and grassland habitats in the Great Plains as it migrated between its breeding and overwintering habitats in Alaska and South America, respectively. Habitat loss, widespread overhunting, and loss of food resources led to the decline and eventual loss of this species. It is now thought to be extinct. Swenk reports in 1926, "The last report for Nebraska was on April 8, 1926. A flock of eight birds was seen 6 kilometers (km) (4 miles) east of Hastings. (Swenk 1926:117)" (Gollop et al. 1986). Correspondence from the Nebraska USFWS and NGPC has determined that this species would not be impacted by the proposed Project (AECOM 2009a, USFWS 2012b). The species has not been confirmed in Nebraska since 1926 and in South Dakota since 1963. The species does not occur in Montana. It is unlikely that the proposed Project would have an adverse effect on the Eskimo curlew given the paucity of confirmed sightings of the species and the lack of suitable habitat along the proposed Project route. Because the Eskimo curlew has not been found in Nebraska since 1926 and in South Dakota since 1963, the proposed Project is not expected to impact this species and was eliminated from further analysis.

1.4.3 Topeka Shiner - Endangered

The federally endangered Topeka shiner (*Notropis topeka*) inhabits cool, clear, spring-fed streams with well-developed riparian corridors. It occurs in South Dakota in the James, Vermillion, and Big Sioux rivers watersheds, and in Nebraska in the Taylor, Big Slough, and Brushy creek watersheds. The Topeka shiner also occurs in Butler County, Kansas (USFWS 2008a). One pump station proposed for Butler County, Kansas is located within an agricultural field and suitable habitat does not exist for the Topeka shiner in or near this location. The proposed Project does not cross any streams where Topeka shiners have been found, based on

extensive survey work conducted for this and other native fish species. Thus, the proposed Project is not expected to impact this species and was eliminated from further analysis.

1.4.4 Blowout Penstemon - Endangered

The blowout penstemon (*Penstemon haydenii*) is a federally listed endangered plant and is state-listed in Nebraska as endangered. Blowout penstemons are found in the Sandhills of north-central Nebraska. Currently, 32 blowout penstemon populations (10 native population sites and 22 introduced population sites) occur in the Sandhills of Nebraska (Stubbendieck 2008) including plantings in Rock County, Nebraska. Blowout penstemon is a federally endangered plant found in blowouts in Nebraska and Wyoming sandhill habitat. The plant can be found in early successional blowout habitat where it has little competition for scarce water and nutrients from other plants. However, as blowout habitats mature and become stabilized, other plants will become established, and the blowout penstemon disappears. Stabilization of blowouts and other disturbances that result in the physical loss of these habitats can have an adverse effect on the blowout penstemon.

The northern portion of the proposed Project in Nebraska is being rerouted to the east to avoid the Sandhills of Nebraska. Further, the blowout penstemon is not likely to occur within the proposed Project area in Rock County, Nebraska, as the known occurrences are well west of the proposed area. Pedestrian botanical surveys of the proposed Project in 2012 also did not locate any suitable habitat for the species. Presence/absence surveys were not recommended for this plant because no construction or related activities and impacts would occur in blowout penstemon habitat; therefore the blowout penstemon was eliminated from detailed analysis in this BA. It is unlikely that the proposed Project will have an effect on the blowout penstemon because of the lack of suitable habitat for the species along the proposed Project route.

2.0 PROPOSED ACTION

2.1 PROPOSED ACTION BACKGROUND

Keystone has applied to the Department for a Presidential Permit for the construction, connection, operation, and maintenance of the proposed Project pipeline and associated facilities at the border of the United States for importation of crude oil from Canada. The Department receives and considers such applications for Presidential Permits for facilities to transport petroleum, petroleum products, coal, and other fuels transmission projects pursuant to the President's constitutional authority, which authority the President has delegated to the Department in Executive Order (EO) 13337, as amended (69 Federal Register [FR] 25299). Under EO 13337, the Secretary of State may issue a Presidential Permit for a border crossing facility if she finds that issuing such a permit would be in the "national interest." EO 13337 also specifies a process for the Department to seek the views from certain other agencies on whether issuing a permit would be in the national interest. It was determined in consultation with other agencies (including BLM and the United States Army Corps of Engineers [USACE]) that the Department would act as the lead federal agency for the environmental review of the proposed Project consistent with National Environmental Policy Act (NEPA). Consequently, the Department is also the lead agency consulting with the USFWS consistent with Section 7 of the ESA.

Several federal agencies are cooperating agencies with the Department, and involved in some capacity with the proposed Project. The proposed Project would affect numerous rivers and wetlands, thus the USACE would issue Section 404 permits as necessary. Because the proposed Project would cross both public and private lands, the BLM would evaluate the proposed Project and decide whether to grant Keystone an ROW across those federal lands pursuant to ROWs under the Mineral Leasing Act (43 Code of Federal Regulations [CFR] 2880). These federal lands principally include 43 miles of pipeline ROW in Montana, but the proposed pipeline would also cross or go under Bureau of Reclamation facilities on federal land in Montana and on private land in South Dakota. The Western Area Power Administration would own a small section of a 230-kV transmission line in southern South Dakota. This line would supply upgraded load capacity and support voltage requirements for pump stations 20 and 21 (in Tripp County, South Dakota) in the future if the proposed pipeline were to operate at full capacity sometime in the future. Finally, the Rural Utilities Service of the Department of Agriculture would provide grants to help fund construction of some of the power distribution lines that may be built to provide power to the proposed pipeline pump stations.

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. The proposed Project would have the nominal capacity to deliver up to 830,000 barrels per day of crude oil. Detailed Project information is provided in the Supplemental EIS issued by the Department. For the previous proposed Project application (see Final EIS August 2011), updates to tables and text are provided below where changes have occurred for the proposed Project.

In general, there have been 64 route modifications made in Montana, 51 route modifications in South Dakota, and 16 route changes in Nebraska since the Final EIS was issued, to accommodate landowner concerns and the results of engineering and environmental surveys, and to comply with state permitting requirements (route modifications and changes can be found in Section 1,

pages 16 through 25, of the September 7, 2012, TransCanada Keystone XL Pipeline Project Environmental Report) (exp Energy Services Inc. 2012). Of these, only 2 in Montana are outside the previous survey corridor, 29 in South Dakota are outside the survey corridor, and the 11 route changes in Nebraska are outside the survey corridor. The route changes in Nebraska result from Keystone's agreement to reroute the pipeline around the NDEQ-identified Sand Hills Region. No changes have been made to the two pump station locations in Kansas from the 2011 Final EIS. Within North Dakota, the proposed Project includes an ancillary facility that will be used as a rail siding and pipe storage location. The North Dakota 60-acre pipe yard was used previously as part of TransCanada Pipelines Limited's Bison Pipeline Project. An overview map of the Project location is provided in Figure 2.1.5-1. Figures 2.1.5-2 through 2.1.5-6 show the more detailed pipeline route and aboveground facility locations for Montana, North Dakota, South Dakota, Nebraska, and Kansas. Pipeline aerial photo and United States Geologic Survey (USGS) topographic map route sheets for the currently proposed Project, power line routes, and site-specific river horizontal directional drilling (HDD) crossing plans are part of the September 7, 2012 TransCanada Keystone XL Pipeline Project Environmental Report, in connection with the Department review of Keystone's pending Presidential Permit application (see Appendix J of the September 7, 2012 Environmental Report) (exp Energy Services Inc. 2012).

2.1.1 Project Description and Location

From north to south, the proposed Project extends from the United States/Canada border near Morgan, Montana, southeast to Steele City, Nebraska. In total, the proposed Project would consist of approximately 1,203 miles of new, 36-inch diameter pipeline, with 327 miles in Canada and 876 miles in the United States. The United States portion of the proposed Project is summarized on Table 2.1-1.

Table 2.1-1 Keystone XL Project Facilities by State

State	New Construction Pipeline Miles	Ancillary Facilities
Montana	285.65	6 Pump Stations, 84 Access Roads, 25 Main Line Valves (MLVs)
South Dakota	315.30	7 Pump Stations, 59 Access Roads, 13 MLVs
Nebraska[a]	274.44	5 Pump Stations, 48 Access Roads, 4 MLVs
Kansas	0	2 Pump Stations

[a] There were four MLVs proposed in the Final EIS for the proposed route. Other Nebraska valve locations are being determined at this time. The total number of pump stations and access roads has been preliminarily identified based on the proposed route.

The proposed Project would involve the construction of 20 pump stations. Eighteen of these would be constructed and operated along the newly built pipeline on land parcels ranging in area from 5 to 15 acres; there would be six pump stations in Montana, seven in South Dakota, and five in Nebraska. The locations of four of the Nebraska pump stations have yet to be finally determined. Two additional pump stations would be constructed in Kansas along the existing Keystone Cushing Extension; one pump station would be on an undeveloped site in Clay County, and the second would be in Butler County. These pump stations would enable the proposed Project to maintain the pressure required to transport crude oil at the desired throughput volumes.

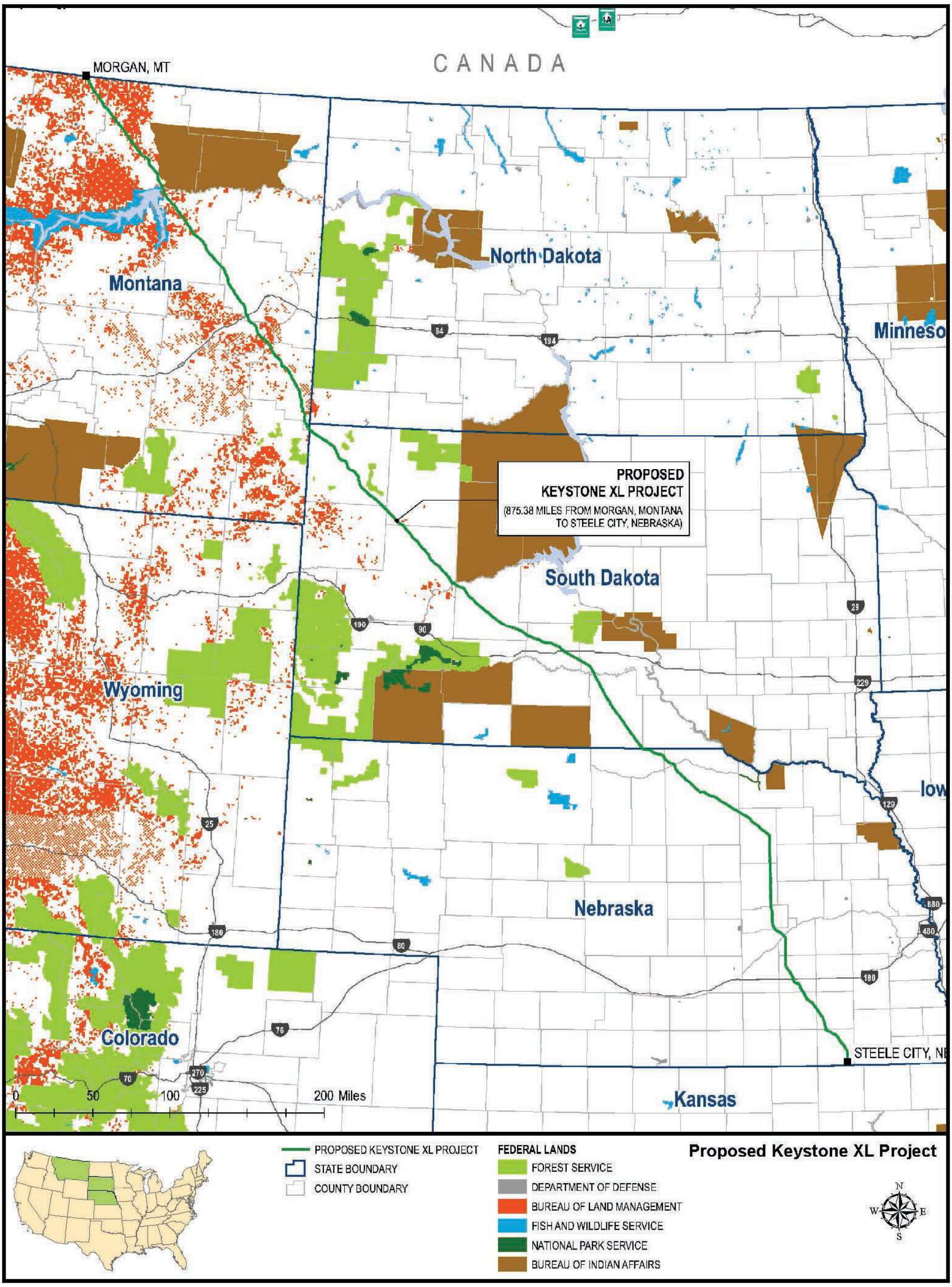

Figure 2.1.5-1 Project Overview

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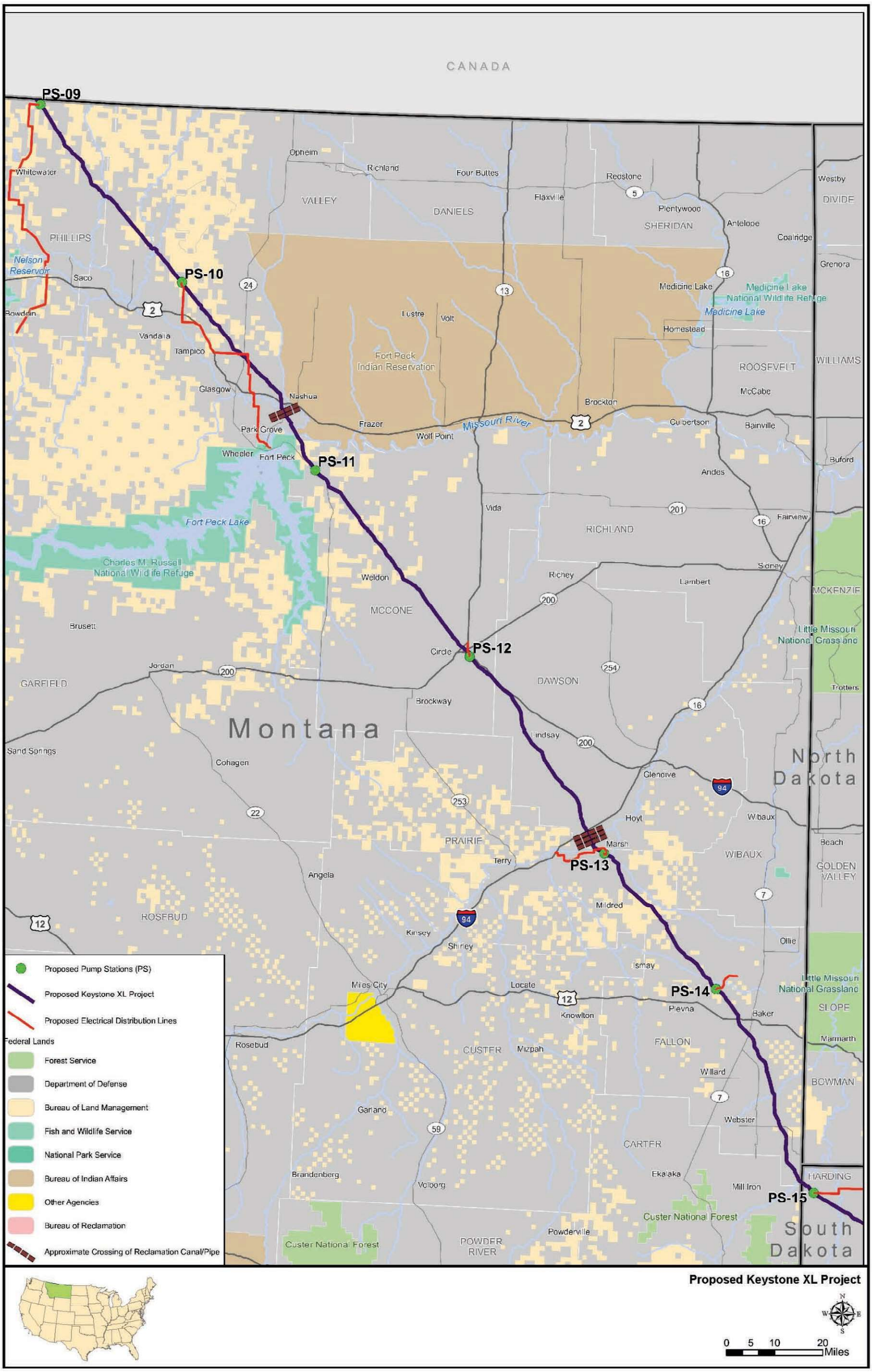

Figure 2.1.5-2 Project Overview (Montana)

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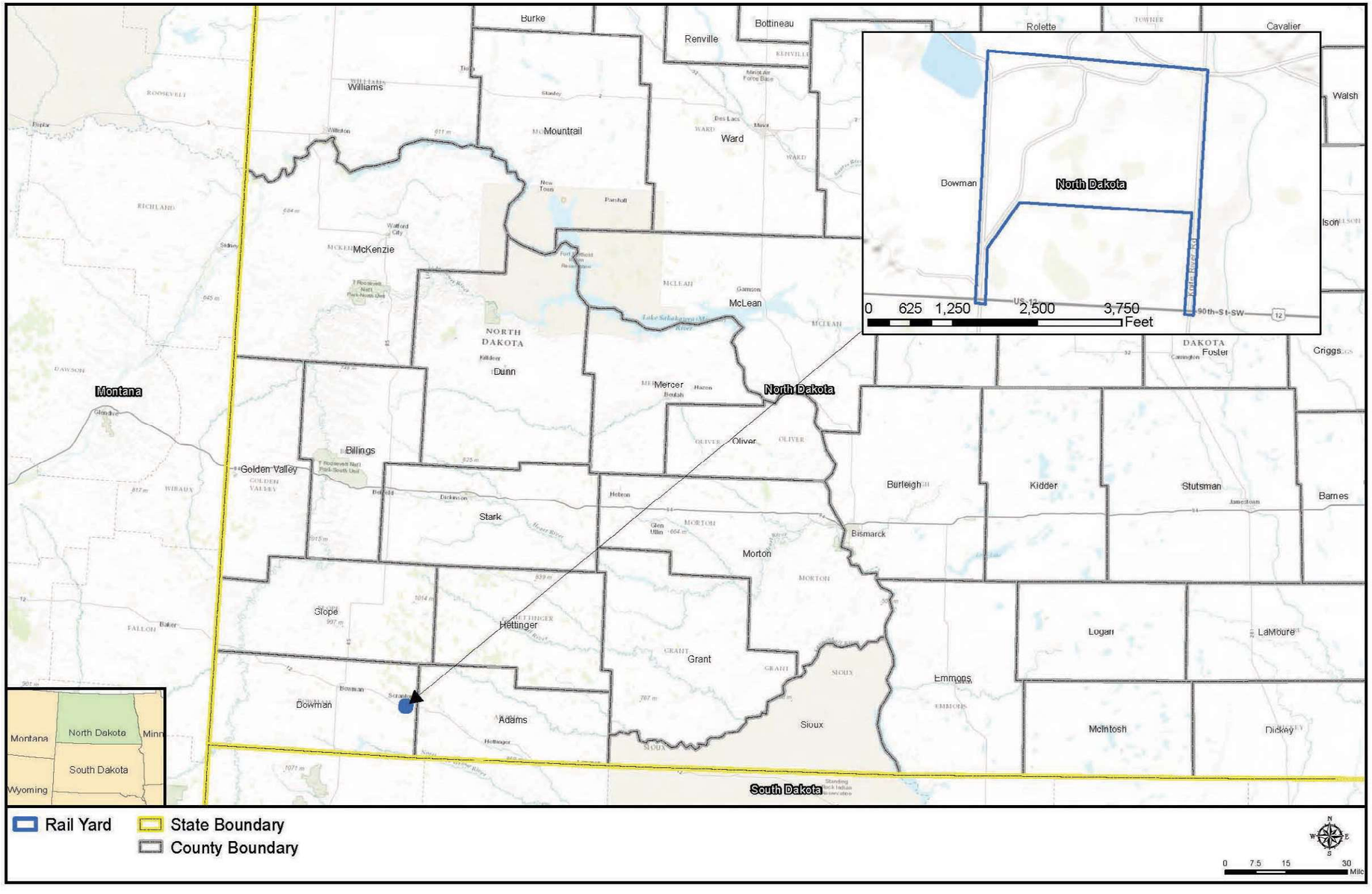

Figure 2.1.5-3 Project Overview (North Dakota)

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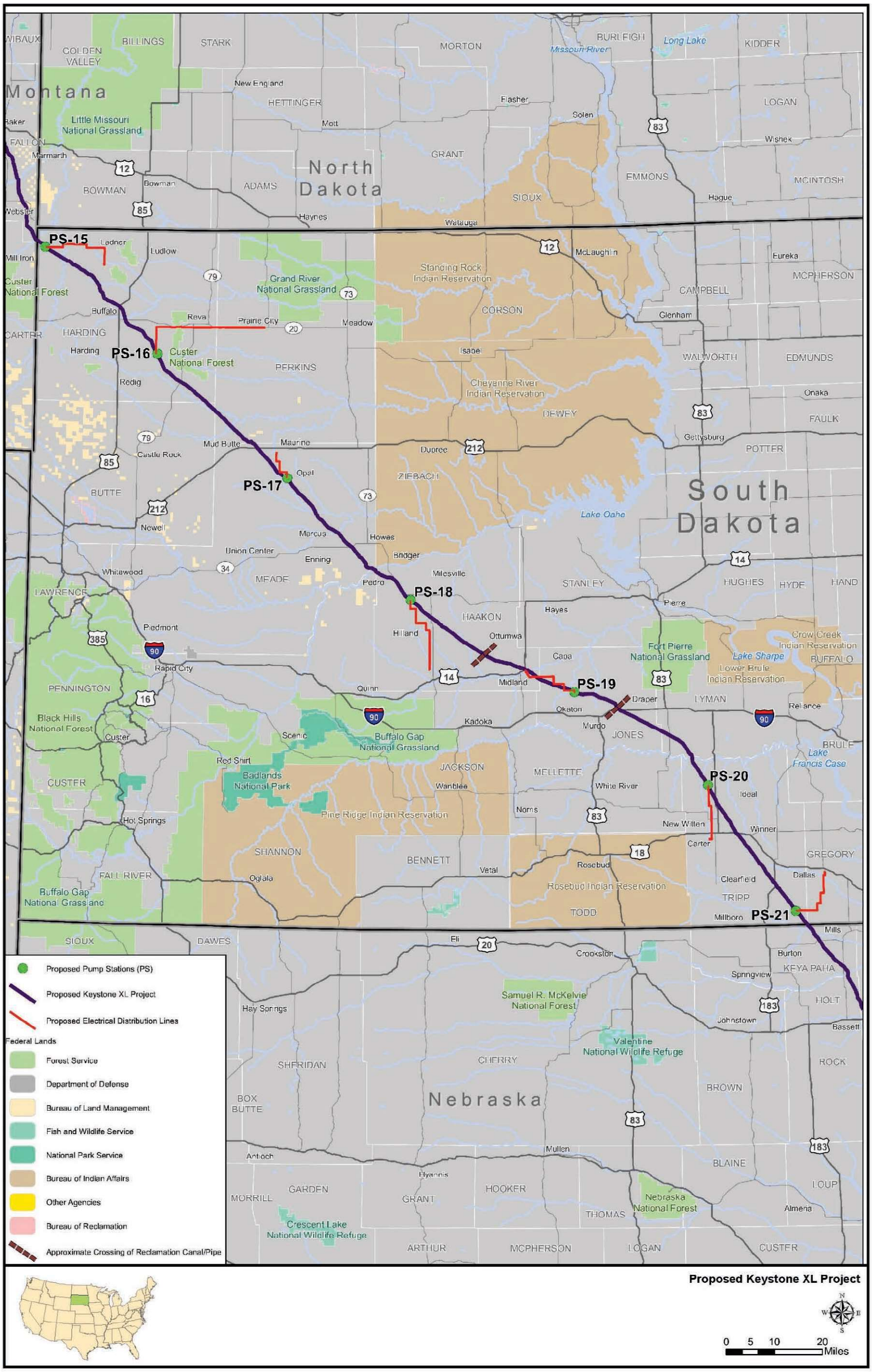

Figure 2.1.5-4 Project Overview (South Dakota)

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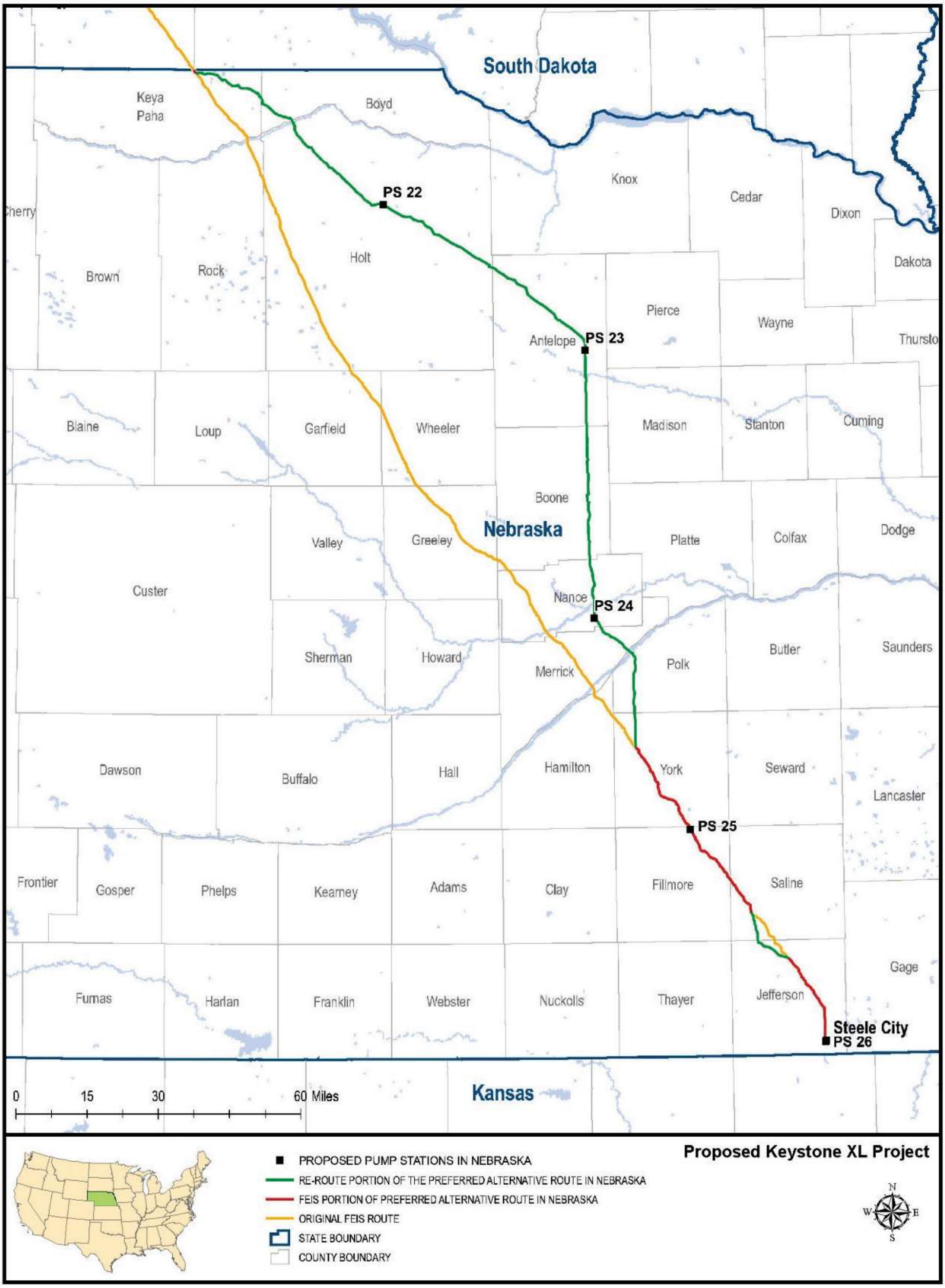

Figure 2.1.5-5 Project Overview (Nebraska)

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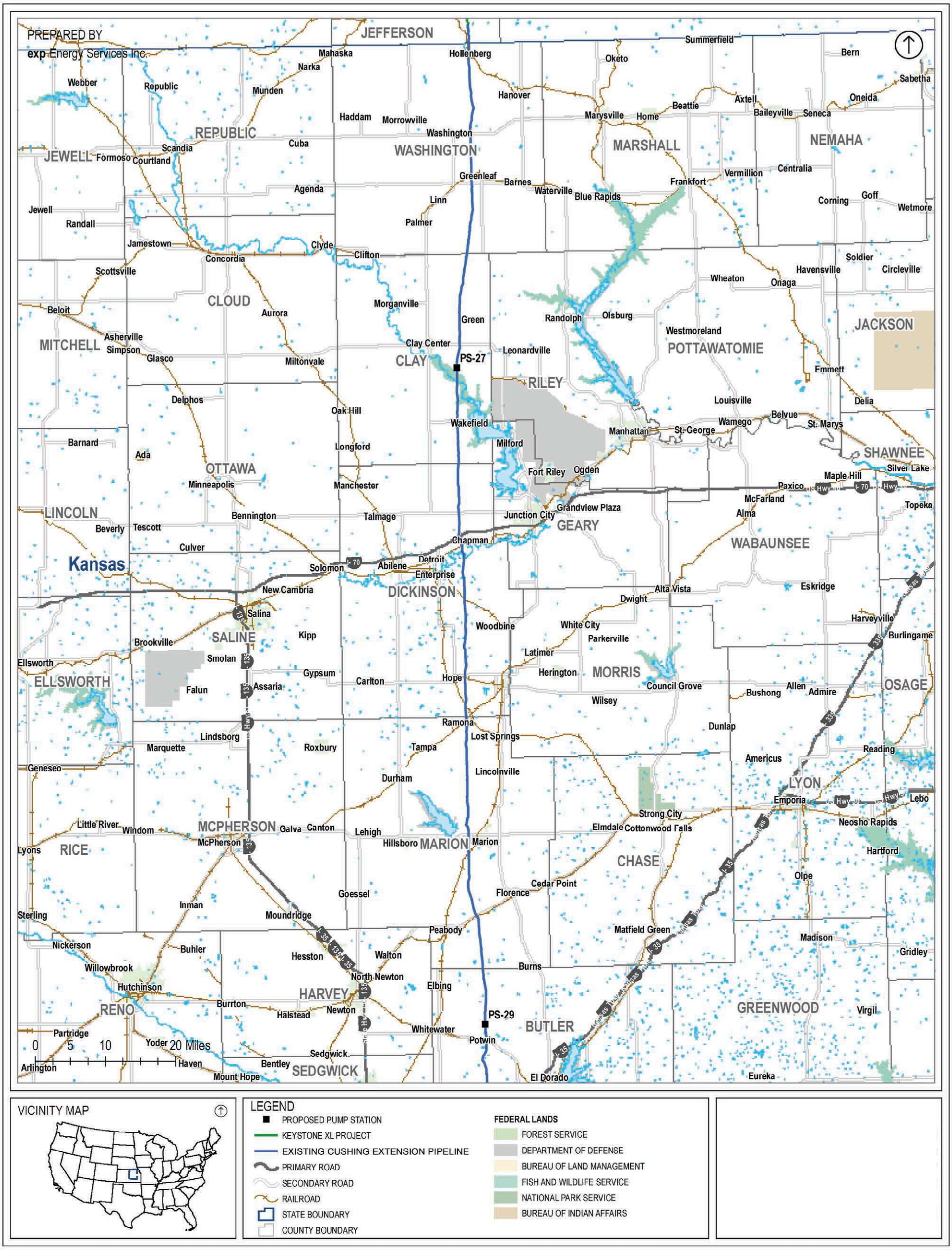

Figure 2.1.5-6 Project Overview (Kansas)

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2.1.2 Pipeline Construction Overview

In the United States, the proposed Project is planned to be constructed as follows: 36-inch diameter pipeline, approximately 875 miles in length, from the United States/Canada Border at Morgan, Montana, to Steele City, Nebraska, which would be constructed with 10 mainline spreads[1], varying in length between approximately 80 and 94 miles each, in 2013 and 2014.

2.1.3 Ancillary Facilities Summary

In addition to the pipeline, Keystone proposes to install and operate aboveground facilities consisting of 20 new pump stations on the Keystone XL line. Of these, two pump stations would be constructed in Kansas along the existing Keystone Cushing Extension. One pump station would be constructed on an undeveloped site in Clay County; another pump station would be constructed in Butler County (see Figure 2.1.5-6). 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, 42 intermediate MLVs (with some in Nebraska that have yet to be determined), 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 2.1.11, Operation and Maintenance.

Additional facilities such as power lines required for the pump stations, remotely operated valves, and densitometers would be required to obtain permits from appropriate agencies and would be installed and operated by local power providers and not by Keystone. A summary of impacts associated with the installation of the power lines is contained in Section 6 of the September 7, 2012, Environmental Report (exp Energy Services Inc. 2012).

2.1.4 Land Requirements

Surface disturbance associated with the construction and operation of the proposed Project is summarized on Table 2.1-2. Approximately 16,277 acres of land would be disturbed during construction of the proposed facilities. After construction, the temporary ROW would be restored and returned to its previous land use. After construction is complete, approximately 5,584 acres would be retained as permanent ROW and for permanent ancillary facilities. All disturbed acreage would be restored and returned to its previous aboveground land use after construction, except for approximately 286 acres of permanent ROW, which would not be restored but would serve to provide adequate space for aboveground facilities including pump stations and valves, for the life of the proposed pipeline. In addition, four pump stations would be relocated in Nebraska and would permanently convert agricultural land to industrial use, approximately 40 to

[1] Large, linear construction projects typically are broken into arbitrary, manageable lengths called "spreads," and utilize various specialized crews; each crew with its own responsibilities. As one crew completes its work, the next crew moves into position to complete its piece of the construction process.

60 acres. 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.

Table 2.1-2 Summary of Lands Affected for the Proposed Project

		Lands Affected (Acres)	
State	**Facility**	**Construction**	**Operation**
Montana	Pipeline ROW	3,784.42	1,727.75
	Additional Temporary Workspace Areas	518.64	0.00
	Pipe Stockpile Sites, and Contractor Yards	517.28	0.00
	Construction Camp	242.88	0.00
	Pump Stations and Delivery Facilities	65.79	65.79
	Access Roads	337.03	47.41
	Rail Sidings[a] (3 Sites)	60.00	0.00
	Montana Subtotal	5,526.05	1,840.95
South Dakota	Pipeline ROW	4,153.37	1,906.83
	Additional Temporary Workspace Areas	460.37	0.00
	Pipe Stockpile Sites, and Contractor Yards	605.07	0.00
	Construction Camp	250.04	0.00
	Pump Stations and Delivery Facilities[b]	65.63	65.63
	Access Roads	222.96	24.34
	Rail Sidings[a] (3 Sites)	60.00	0.00
	South Dakota Subtotal	5,817.44	1,996.80
North Dakota	Pipeline ROW	0.00	0.00
	Additional Temporary Workspace Areas	0.00	0.00
	Pipe Stockpile Sites, and Contractor Yards	56.05	0.00
	Construction Camp	0.00	0.00
	Pump Stations and Delivery Facilities[b]	0.00	0.00
	Access Roads	0.00	0.00
	North Dakota Subtotal	56.05	0.00

State	Facility	Lands Affected (Acres) Construction	Operation
Nebraska	Pipeline ROW	3,637.41	1,663.68
	Additional Temporary Workspace Areas	226.88	0.00
	Pipe Stockpile Sites, and Contractor Yards[c]	680.00	0.00
	Construction Camp[c]	80.00	0.00
	Pump Stations and Delivery Facilities[b]	67.12	67.12
	Access Roads	70.50	0.00
	Rail Sidings[a]	100.00	0.00
	Nebraska Subtotal	4,861.91	1,730.80
Kansas	Pipeline ROW	0.00	0.00
	Additional Temporary Workspace Areas	0.00	0.00
	Pipe Stockpile Sites, and Contractor Yards	0.00	0.00
	Construction Camp	0.00	0.00
	Pump Stations and Delivery Facilities[b]	15.15	15.15
	Access Roads	0.00	0.00
	Rail Sidings[a]	0.00	0.00
	Kansas Subtotal	15.15	15.15
Total =		**16,276.60**	**5,583.78**

[a] Rail siding acreage represents 20 acres for each site. Total acreage for rail sidings = 140 acres.

[b] Pump station acreages are a nominal number set at 15 acres. Except PS-26, actual acreage was used (7.12 acres).

[c] These are estimated acreages; locations have not been finalized at this time.

2.1.5 Pipeline Right-of-Way

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 and a 50-foot permanent ROW. Figures 2.1.5-7 and 2.1.5-8 illustrate the typical construction ROW and equipment work locations where the pipeline would be co-located with an existing linear feature. The construction ROW would be reduced to 85 feet in certain areas, which could include some habitat for federally protected and candidate species, wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas. Thirty miles (3 percent) of the proposed Project would be located within approximately 300 feet of existing pipelines, utilities, or road ROWs. The remainder of the proposed pipeline, approximately 845 miles (97 percent), would be situated in a new ROW.

2.1.6 Additional Temporary Workspace Areas

In addition to the typical construction ROW, Keystone has identified typical types of additional temporary workspace 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 impacts covering about 1,206 acres 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 and candidate 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 close proximity, and areas where trees or other features are identified for avoidance near streams and wetlands.

2.1.7 Pipe Stockpile Sites, Railroad Sidings, and Contractor Yards

Extra workspace areas outside of the temporary construction ROW covering approximately 1,226 acres would be required during the construction of the proposed Project to serve as pipe storage sites, railroad sidings, and contractor yards (Table 2.1-3) (with some in Nebraska that have yet to be determined). Pipe stockpile sites along the pipeline route have typically been identified in proximity to railroad sidings. To the extent practical, Keystone would use existing commercial/industrial sites or sites that previously were used for construction. Existing public or private roads would be used to access each yard. Both 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.

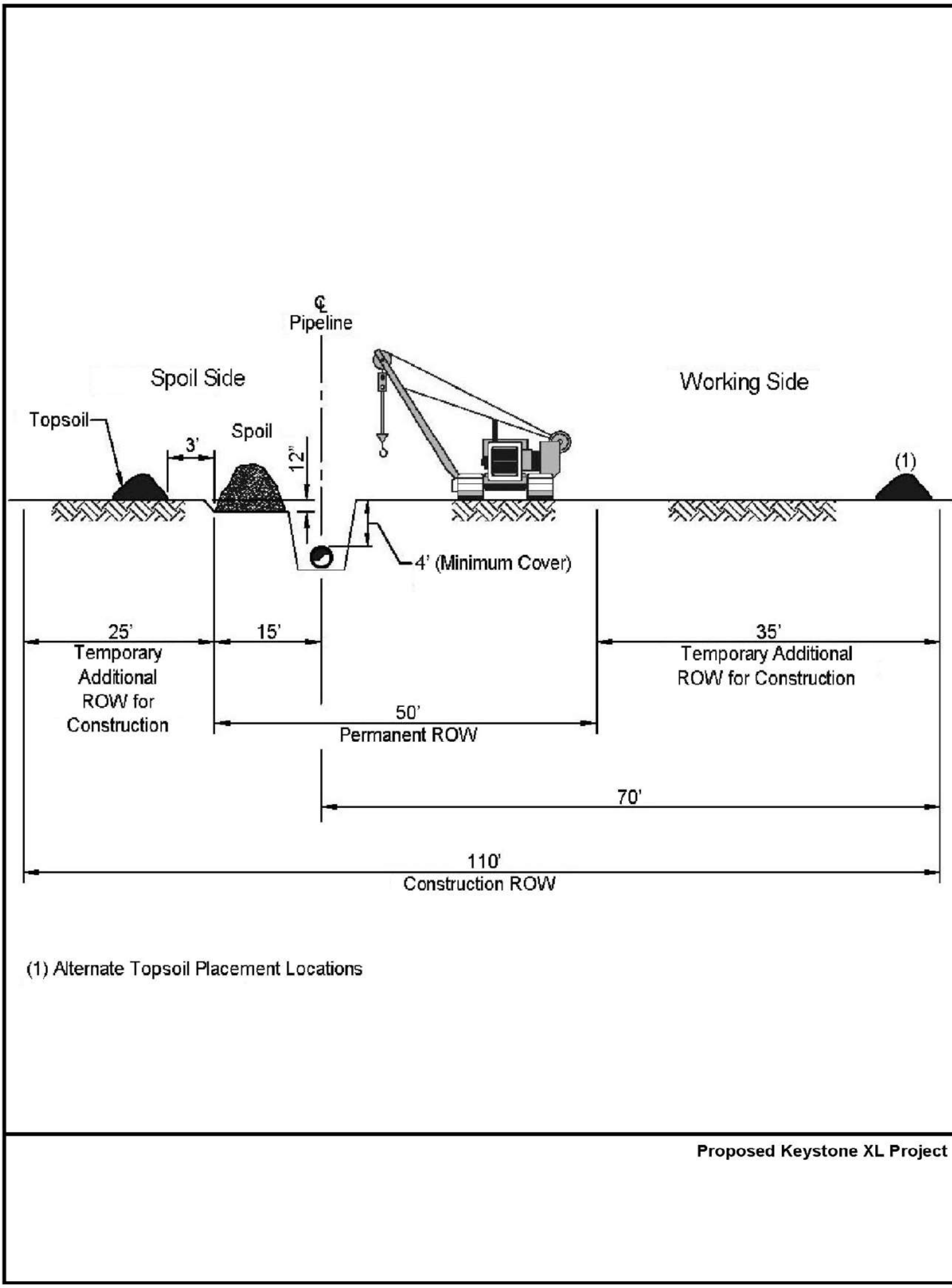

Figure 2.1.5-7 Typical 110-foot Construction ROW (36-inch Pipeline) with Topsoil Removal only over Trench Line

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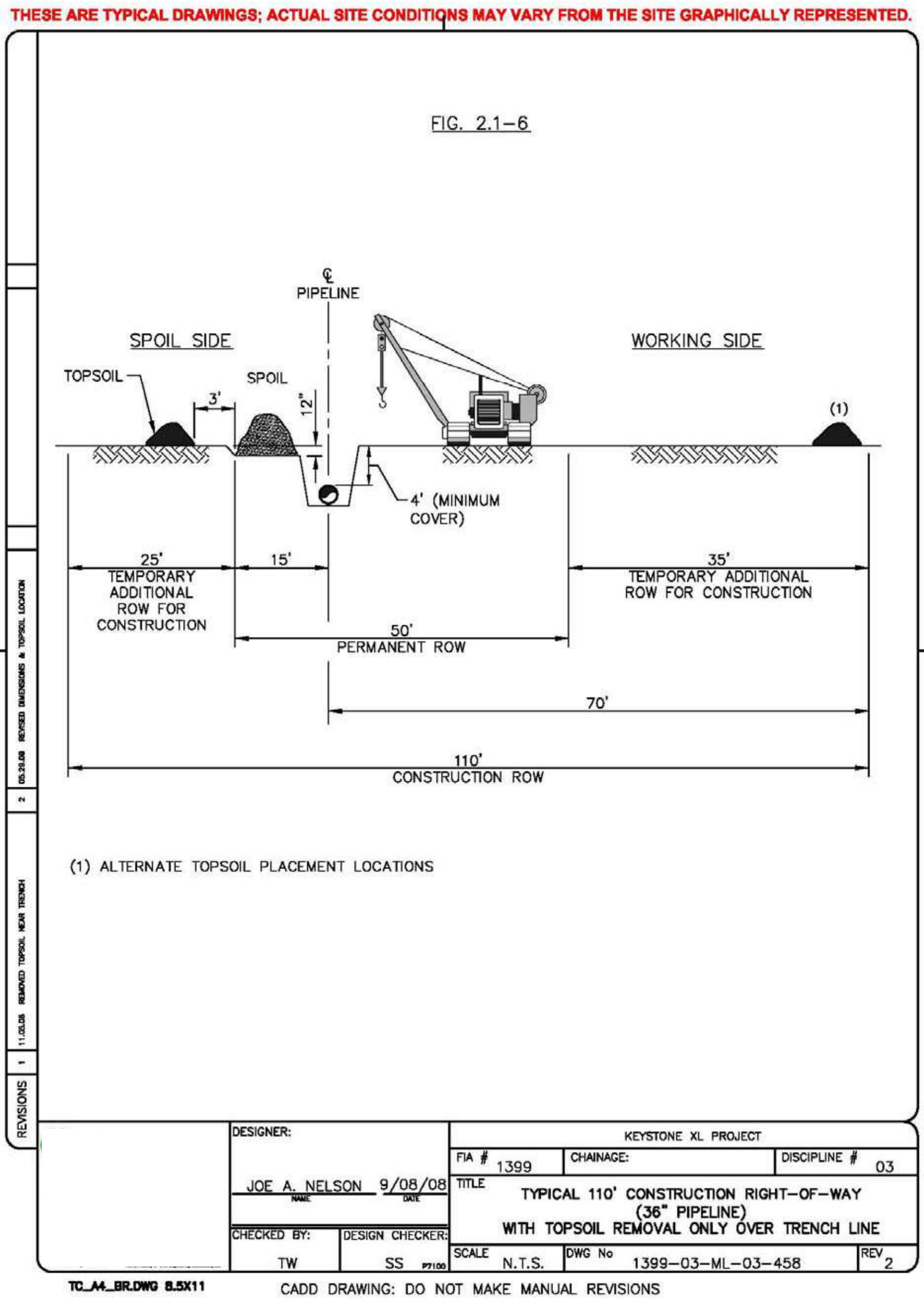

Figure 2.1.5-8 Typical 110-foot Construction ROW (36-inch Pipeline) Spoil Side Adjacent and Co-located to Existing Pipeline

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Table 2.1-3 Locations and Acreages of Proposed Pipe Storage Sites, Railroad Sidings, and Contractor Yards

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
Montana	Dawson, McCone, Valley, Fallon	Contractor Yards	5	161
	Roosevelt, Sheridan, Prairie	Rail Sidings[a]	3	60
	Phillips, Dawson, McCone, Valley, Fallon	Pipe Yard Stockpile Sites	9	283
South Dakota	Tripp, Haakon, Jones	Contractor Yards	7	258
	Hughes, Lyman, Pennington	Rail Sidings[a]	3	60
	Tripp, Haakon, Jones	Pipe Yard Stockpile Sites	11	347
North Dakota	Bowman	Pipe Yard Stockpile Sites	1	56
Nebraska	Fillmore, Greeley, Holt, Jefferson, Merrick, York	Contractor Yards	8	233
	Butler, Hamilton, Holt, Jefferson, Valley	Rail Sidings	5	100
	Antelope, Boone, Fillmore, Hamilton, Holt, Jefferson, Keya Paha, Nance	Pipe Yard Stockpile Sites	11	447
Kansas	NA	NA	NA	NA
		TOTAL		1,805

[a] Nominal Acreage of 20 acres each assigned to rail sidings.

Locations and Acreages of Proposed Contractor Camps

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
Montana	McCone, Valley (2), Fallon	Contractor Camps	44	243[1]
South Dakota	Tripp, Harding, Meade	Contractor Camps	3	250
North Dakota	NA	NA	NA	NA
Nebraska	Holt	Contractor Camp	1	80
Kansas	NA	NA	NA	NA
		TOTAL		573

[a] Additional camp in Valley County has not yet been sited, acreage TBD.

2.1.8 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. A total of eight temporary construction camps would be established; four

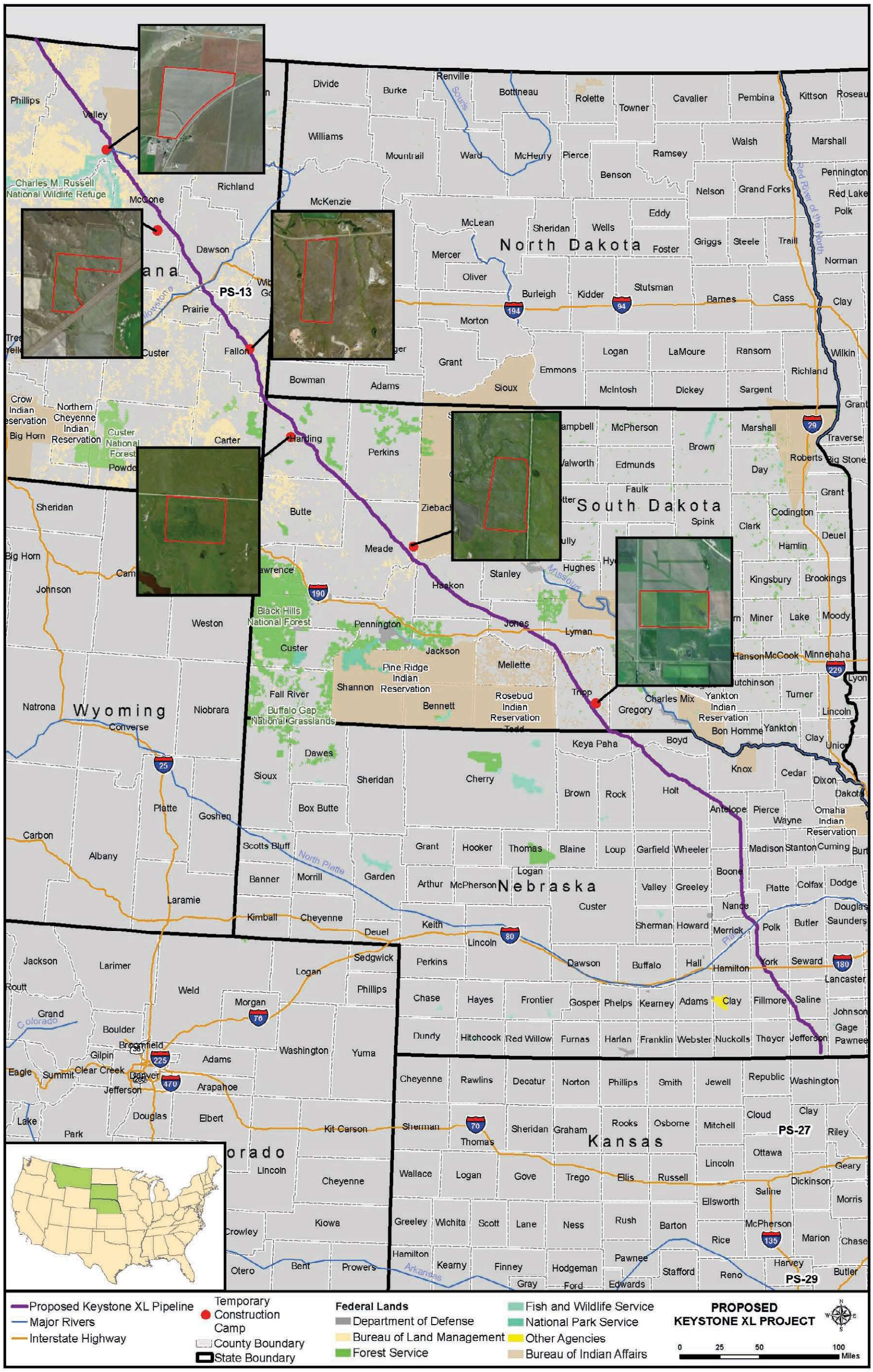
construction camps would be in Montana (McCone, Valley [2], and Fallon counties), and three camps would be in South Dakota (Tripp, Harding, and Meade counties) (the approximate location of six of these camps is shown in Figure 2.1.8-1). The total acreage for the seven camps planned in Montana and South Dakota for which acreage is known equals 492.92 acres (exact acreage for the fourth camp in Montana is not yet known, subject to final acquisition of the proposed site). Keystone is also investigating the possibility of building a temporary construction camp at a suitable location in Holt County in northern Nebraska that would alleviate short-term housing in that area during construction. Each camp would be approximately 80 acres in size, which would include about 30 acres for pipe and/or contractor yard space, as well as the camp itself. The number and size of the camps would be determined based on the time available to complete construction and to meet Keystone's commercial commitments. 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 2.1-4.

Table 2.1-4 Construction Camp Permits and Regulations

State	Permit or Approval	Agency[b]	Submitted by
Montana	Water Main Certified Checklist	MDEQ	Keystone
	Sewer Main Certified Checklist	MDEQ	Keystone
	NOI and 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 & Distribution System[a]	NDEQ	Keystone
	Wastewater Collection & Treatment System[a]	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

Source: exp Energy Services Inc. 2012.

[a] Submittal for approval requires the submission of a design report, plans, and specifications certified by a professional engineer.
[b] MDEQ = Montana Department of Environmental Quality, MBCB = Montana Building Code Bureau; MDT = Montana Department of Transportation, DPHHS = Department of Public Health and Human Services; 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; SDDENR = South Dakota Department of Environment and Natural Resources; DOH = Department of Health.



Source: exp Energy Services, Inc. 2012.

Figure 2.1.8-1 Proposed Temporary Construction Camp

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2.1.8.1 Camp Design

Each construction camp site would be established on an approximately 80-acre site (the sites could range from 50 acres up to 100 acres with the inclusion of a contractor yard). Of that area, 30 acres would be used as a contractor yard, and approximately 50 acres would be used for housing and administration facilities. 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 to comply 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 wash rooms.

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 1 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, as discussed below.

If an adequate supply cannot be obtained from a well, water would be obtained from municipal sources or trucked to each 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 on site 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 on site through diesel-fired generators, or would be provided by local utilities from an interconnection to their distribution system. 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.

2.1.8.2 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 by welding

rigs. Also, support workers such as mechanics, parts and supply staff, and supervisory personnel would drive to the ROW in separate vehicles.

Based on the current construction schedule, the camps would operate in standby mode during the winter (from December through March or April). Each camp would have sufficient staff to operate and secure the camp and associated systems during that time period.

2.1.8.3 Camp Decommissioning

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) (Appendix B).

2.1.9 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 2.1-2 for Montana and South Dakota with Nebraska being determined upon approval of the route identified in the Supplemental Environmental Report for the Nebraska Reroute submittal to NDEQ September 5, 2012 (exp Energy Services Inc. 2012). 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; road widening is also 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.

Access pads[2] would be placed within the construction ROW at crossings of public and private roads, requiring a total of about 20,160 cubic yards of gravel. The approximate number of road crossings requiring access pads is 1,344.

Approximately 191 temporary access roads[3] would be provided for construction, which would cover approximately 631 acres.

There would be 38 permanent access roads[4] to Project facilities, which would cover approximately 72 acres.

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[2] An access pad is area constructed of rock aggregate located at construction access locations. The access pad allows for the reduction in the amount of mud transported onto paved roads by construction vehicles or surface runoff. Access pads provide an area where mud can be removed by vehicle tires traveling over the gravel pad before entering public roads.

[3] There are currently 48 access roads (private roads) along the Nebraska portion of the proposed route, but additional access roads may be needed.

[4] The number in Nebraska is still to be determined.

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 2.1-2. 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 completing cultural resources and biological surveys, along with the appropriate State Historic Preservation Office and USFWS consultations and approvals. Other state and local permits also may be required prior to construction. In the future, newly created access road maintenance would be the responsibility of Keystone.

Existing public and private roads would be used to provide access to most of the construction ROW. Paved roads would not likely require improvement or maintenance prior to or during construction. However, the road infrastructure would be inspected prior to construction to ensure that the roads, bridges, and cattle guards would be able to withstand oversized vehicle use 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, some roads may require widening in some areas.

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.

Approximately 191 temporary access roads would be needed to provide adequate access to the construction sites. Private roads and any new temporary access roads would be used and maintained only with permission of the landowner or the appropriate land management agency. There are currently 48 access roads (private roads) along the Nebraska portion of the proposed route, but additional access roads may be needed. Keystone would also construct short, permanent, access roads from public roads to the pump stations, delivery facilities, and intermediate MLVs. Approximately 21 permanent access roads would be needed in Montana and 17 permanent access roads in South Dakota. The number in Nebraska is still to be determined.

The final locations of new, permanent, access roads would be determined prior to construction. At a minimum, construction of new permanent access roads would require completion of cultural resources and biological surveys and consultations and approvals of the appropriate State Historic Preservation Office and USFWS office. Keystone would comply with all federal, state, and local requirements prior to construction. Newly created access roads maintenance would be Keystone's responsibility, as described below.

The acreages of access roads are included in the listing of lands affected on Table 2.1-2. 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.

2.1.9.1 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. An alternate route would be used where the bridges are not adequate to handle the maximum weight. 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 actions.

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.

2.1.10 Aboveground Facilities

The proposed Project would require approximately 286 acres of land, other than permanent ROW, along the proposed Project segments for aboveground facilities, including pump stations, densitometer sites, intermediate MLVs, and delivery facilities (Table 2.1-5). Nebraska's aboveground facilities are still being evaluated at this point in time. Gravel would be used to stabilize the land for permanent facilities, including pump stations, valve sites, and permanent access roads.

Table 2.1-5 Summary of Aboveground Facilities

State	Facility	Areas Affected (Acres) Construction	Operation
Montana	Pump Stations	65.79	65.79
	Intermediate MLV Locations	1.15	1.15
	Montana Subtotal	66.94	66.94
South Dakota	Pump Stations	65.63	65.63
	Intermediate MLV Locations	0.70	0.70
	South Dakota Subtotal	66.33	66.33
Nebraska	Pump Stations[a]	67.12	67.12
	Intermediate MLV Locations[b]	0.23	0.23
	Nebraska Subtotal	67.35	67.35
Kansas	Pump Stations	15.15	15.15
	Kansas Subtotal	15.15	15.15
	Total	215.82	215.82

[a] Pump station acreages are a nominal number set at 15 acres. Except PS-26, actual acreage was used (7.12 acres).

[b] Nebraska valve locations for the MLVs on the proposed route are pending. Acreage identified in the above table is for the four sites along the Final EIS portion of the proposed route identified in the NDEQ Supplemental Environmental Report for the Nebraska Reroute.

2.1.10.1 Pump Stations

New pump stations, each situated on approximately 15-acre sites, would be constructed for the proposed Project (Table 2.1-5). 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 will be required at pump stations. Keystone will 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 impacts 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.

2.1.10.2 Other Aboveground Facilities

Keystone proposes to construct 44 intermediate MLV sites along the new pipeline ROW (MLVs in the Nebraska portion of the proposed Project MLVs have yet been determined). 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 impacts in the unlikely event of a spill. The actual spacing intervals between the MLVs and intermediate MLVs would be based on the pump station locations, waterbodies wider than 100 feet, and sensitive environmental resources; federal regulations and the 57 Project-specific conditions (Appendix C, PHMSA Conditions for Keystone XL and Keystone Compared to 49 CFR 195) developed by the United States Department of Transportation (USDOT), Pipeline Hazardous Materials Safety Administration (PHMSA); 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.

2.1.10.3 Construction Procedures

The proposed facilities would be designed, constructed, tested, and operated in accordance with all applicable requirements included in the regulations at 49 CFR 195 (*Transportation of Hazardous Liquids by Pipeline)*, other applicable federal and state regulations, and in accordance with the 57 Project-specific special conditions recommended by PHMSA and agreed to by Keystone (see 2.1.11, Operation and Maintenance, and Appendix B, CMRP). These regulations are intended to ensure adequate protection for the public and to prevent crude oil pipeline accidents. Among other design standards, 49 CFR 195 and the proposed Project-specific special conditions specify pipeline material and qualification, minimum design requirements, and protection from internal, external, and atmospheric corrosion.

Environmental Compliance Monitoring

To manage construction impacts, Keystone would implement its CMRP (Appendix B). The CMRP contains procedures that would be used throughout the proposed Project to avoid or minimize impacts. Subsections of the CMRP address specific environmental conditions. Procedures to restore impacts to the permanent ROW are also described in the CMRP.

The following is one example of the mitigation measures (Appendix B, CMRP, Section 7.1) that will 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 CMRP provisions in both Section 6, Wetland Crossings, and Section 7, Waterbodies and Riparian Lands (see Appendix B, CMRP).

The contractor must 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 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 Section 3 of the CMRP (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. 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 will not be making changes to the project outside the surveyed study corridor on which the consultation will be based. Acreage impacts of changes will be tracked to keep within the total used for calculating mitigation. If the contractor requires a project change outside the previously surveyed corridor, then Keystone will be coordinating with the USFWS prior to implementation of the required change.

The Project's Spill Prevention, Control, and Countermeasure (SPCC) Plan (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 will be the point person for communication with the USFWS as required. The monitors that will be used in the field will be reporting to the environmental inspectors, who in turn report to the compliance manager. If required, the monitors will 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.

2.1.10.4 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 45 to 120 miles long (see Table 2.1-6). Final spread configurations and the final construction schedule may result in the use of additional spreads or fewer shorter or longer spreads. Figure 2.1.10-1 depicts the approximate location of each spread. Pipeline construction generally proceeds as a moving assembly line as shown in Figure 2.1.10-2 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 (Section 2.1.11.2).

Table 2.1-6 Pipeline Construction Spreads Associated with the Proposed Project

State	Miles by State	County	Spread Number	Location (Mile Post)	Approximate Length of Construction Spread (Miles)
Montana	285.65	Phillips, Valley	Spread 1	0-90	90
		Valley, McCone	Spread 2	90-151.48	61.48
		McCone, Dawson	Spread 3	151.48-197.68	46.2
		Dawson, Prairie, Fallon	Spread 4	197.68-288.63	90.95

State	Miles by State	County	Spread Number	Location (Mile Post)	Approximate Length of Construction Spread (Miles)
South Dakota	315.29	Harding			
		Harding, Butte, Perkins, Meade	Spread 5	288.63-410.75	122.12
		Meade, Pennington	Spread 6	410.75-500.44	89.69
		Haakon, Jones			
		Jones, Lyman, Tripp	Spread 7	500.44-598.86	98.42
		Tripp	Spread 8	598.86-691.78	92.92
Nebraska	274.44	Tripp, Keya Paha, Boyd, Hold, Antelope			
		Antelope, Boone, Nance, Merrick, Polk	Spread 9	691.78-775.67	83.89
		Polk, York, Fillmore, Saline, Jefferson	Spread 10	775.67-875.38	99.71

Source: exp Energy Services Inc. 2012.

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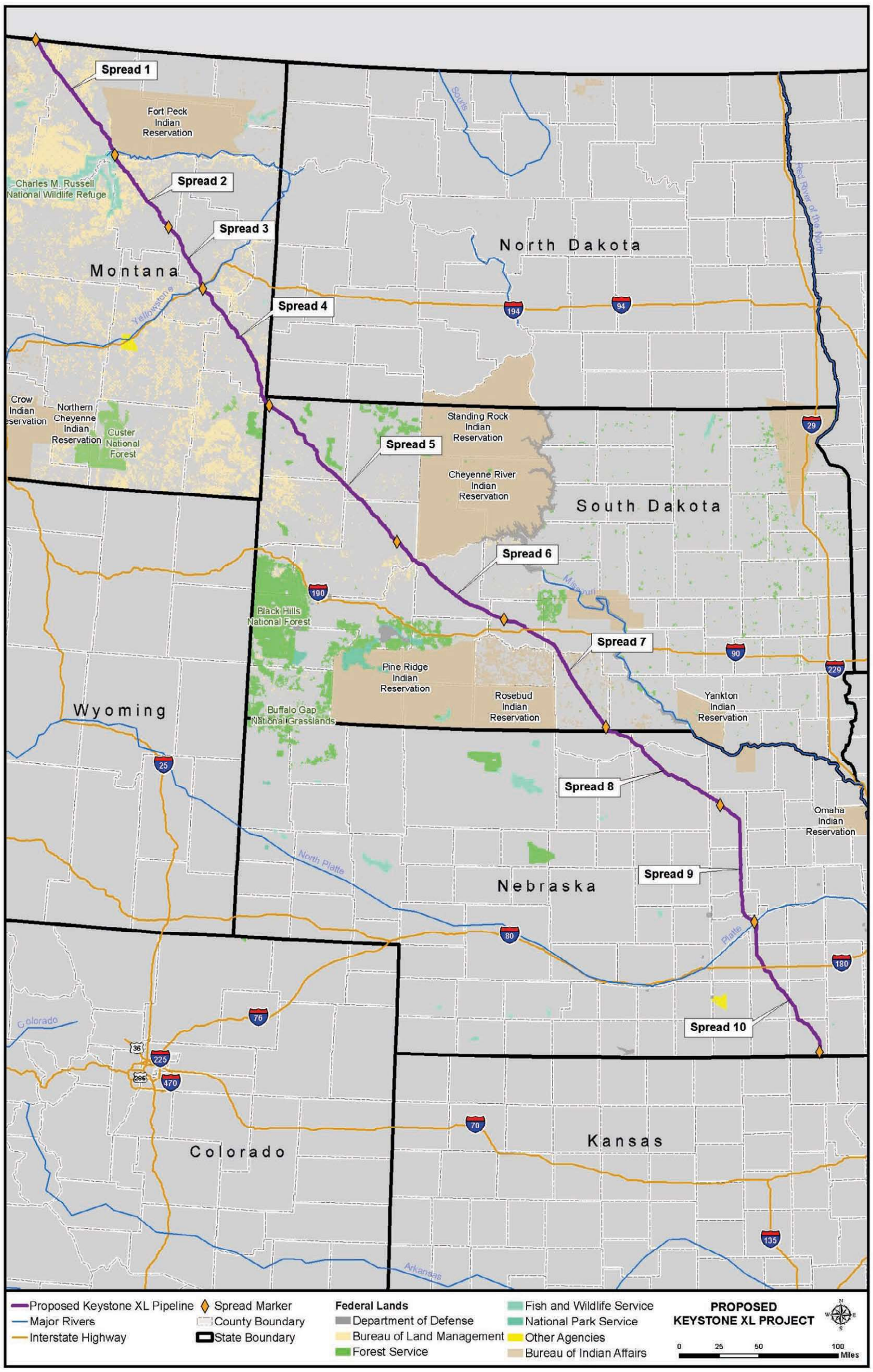

Source: exp Energy Services, Inc. 2012.

Figure 2.1.10-1 Construction Spreads

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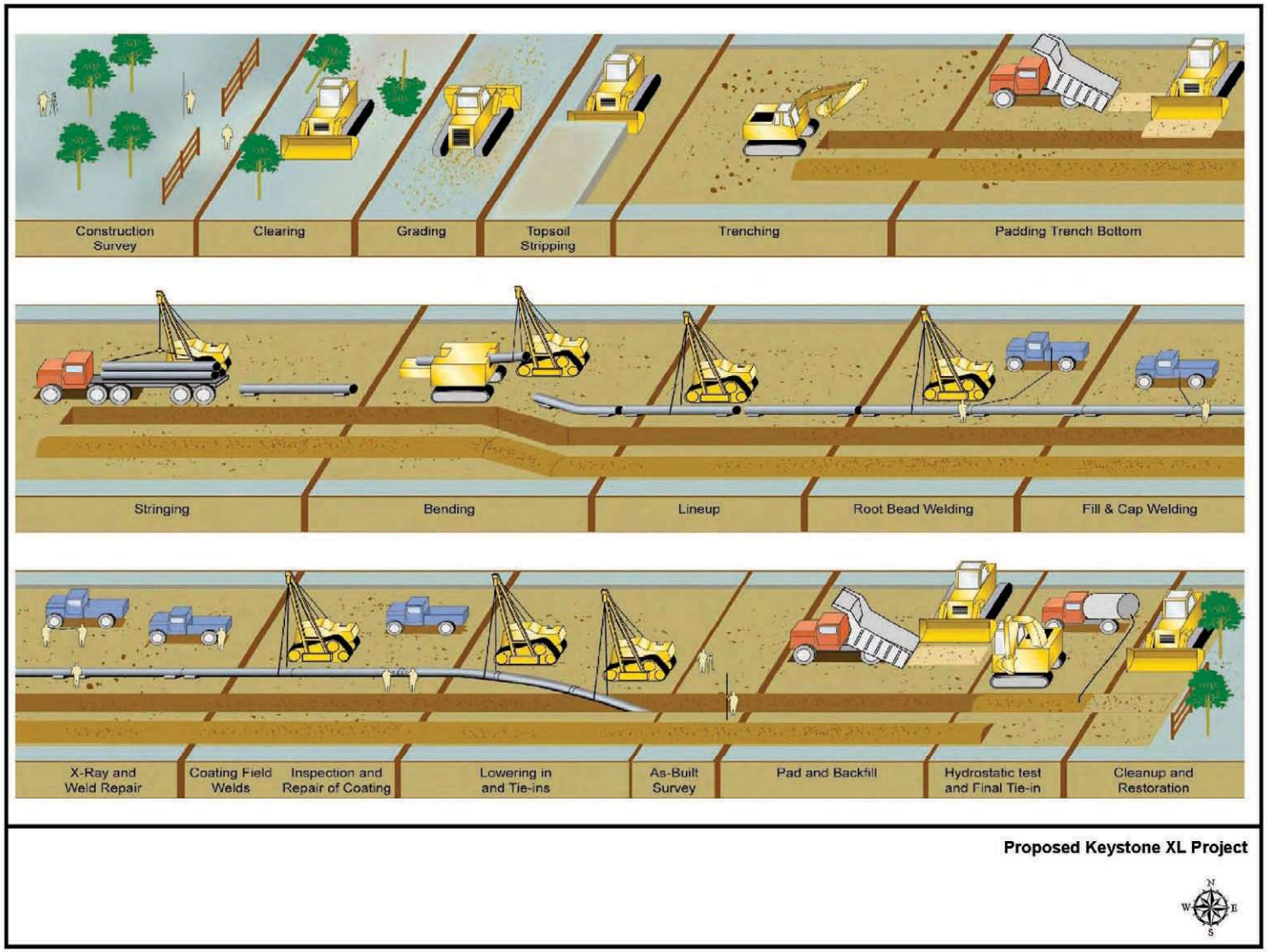

Figure 2.1.10-2 Typical Pipeline Construction Sequence

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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 will 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 Project requirements.

2.1.10.5 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.

2.1.10.6 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). 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 consultation with the landowner (based on agricultural use) and the Natural Resources Conservation Service (NRCS). 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 Appendix B, CMRP, Section 4.5.1, Temporary Erosion and Sediment Control. 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.

2.1.10.7 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 2.1-7). 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.

Table 2.1-7 Minimum Pipeline Cover

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

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 stand-point, 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 (see Figures 2.1.5-7 and 2.1.5-8). 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 Appendix B, CMRP).

2.1.10.8 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 impact 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.

2.1.10.9 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. The CMRP provides a figure depicting a trench breaker and the intervals are discussed in CMRP Section 4.5.3, Trench Plugs (Appendix B). 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.

2.1.10.10 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 pressure 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 2.1-8. 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.

Table 2.1-8 Potential Water Sources along the Project Route[a, b, c, d]

County	Approximate Milepost	Waterbody Name	Maximum Water Withdrawal (million gallons)
Montana			
Phillips	25.4	Frenchman Creek	32
Valley	83.4	Milk River	32
Valley/McCone	89.2 to 89.3	Missouri River	55
Dawson	196.4	Yellowstone River	55
South Dakota			
Harding	295.1	Little Missouri River	27
Harding	315	Gardner Lake	67
Perkins	360.97	North Fork Moreau River	36
Meade	429.9	Cheyenne River	35
Haakon	486	Bad River	22
Tripp	541.3	White River	39

County	Approximate Milepost	Waterbody Name	Maximum Water Withdrawal (million gallons)
Nebraska[e]			
Boyd	618.1	Keya Paha River	37
Holt	626.1	Niobrara River	37
Antelope	713.3	Elk Horn River	37
Nance	761.7	Loup River	37
Polk	775.2	Platte river	47

[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 will determine which rivers can be used, if they approve the volume, and any permitting conditions associated with the withdrawals. Water will be used for hydrostatic test water, drilling mud for HDD operations, and dust control.

[b] Additional water sources will be needed for dust control. These additional sources will 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 project for approximately 55 million gallons of water for dust control, hydrostatic testing, and HDD operations.

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, 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 BMP protocols include:

- 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 or candidate species, or waterbodies designated as public water supplies, unless appropriate federal, state, or local permitting agencies grant written permission. To avoid impacts 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 (Appendix B).

2.1.10.11 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.

2.1.10.12 Final Tie-ins

Following successful hydrostatic testing, test manifolds would be removed and the final pipeline tie-in welds would be made and inspected.

2.1.10.13 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.

2.1.10.14 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 NRCS recommendations. 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 three 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 Appendix B, CMRP, Section 4.16, Operations and Maintenance).

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 re-established would be revegetated by Keystone or Keystone would compensate the landowner for reseeding. The CMRP (Appendix B) provides information on revegetation and weed control procedures that Keystone would incorporate into the proposed Project.

2.1.10.15 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.

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.

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.

Steep Terrain

Additional grading may be required in areas where the proposed pipeline route would cross 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 Appendix B, CMRP, Section 7.11, Stabilization and Restoration of Stream Banks and Slopes).

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 Appendix B, CMRP, Section 4.5.2, Sediment Barriers, and Section 7.11, Stabilization and Restoration of Stream Banks and Slopes).

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 (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 Appendix B, CMRP, Section 4.15.3, Right-of-Way Reclamation).

Waterbody Crossings

There are approximately 1,073 waterbody crossings along the proposed Project route, including 56 perennial streams, 974 intermittent streams, 28 canals, 4 artificial impoundments, and 11 waterbodies identified as either artificial or natural lakes, ponds, or reservoirs. 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 USACE 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 will be used for construction equipment to cross streams. Waterbody crossing construction methods are explained in Appendix B, CMRP, Section 7.4, Waterbody Crossing Methods.

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 PHMSA required burial depth.

The proposed Project would utilize 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 stream banks are restored and stabilized and the flume or pump hoses are removed.

Keystone plans to use the HDD method for crossing 14 waterbodies that are crossed one time on the proposed Project (Table 2.1-9). 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.

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. MSDS sheets can be provided when a contractor is selected and they determine which drilling mud they will 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 *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 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.
- 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 (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. These workspaces would be located at least 10 feet away from the water's edge, except where the adjacent upland consists of actively cultivated or rotated cropland or other disturbed land. 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 Appendix B, CMRP, Section 7.3, Vehicle Access and Equipment Crossings). 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.

Table 2.1-9 Waterbodies and Wetlands Crossed Using the Horizontal Directional Drilling Method

State	County	Approx. MP	Waterbody Name
Montana	Phillips	25.3	Frenchman Creek
	Valley	83.4	Milk River
	McCone	89.6	Missouri River
	Dawson	198.1	Yellowstone River
South Dakota	Harding	295.1	Little Missouri River
	Meade/Pennington	429.9	Cheyenne River
	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	713.3	Elk Horn River
	Nance	761.7	Loup River
	Polk	775.2	Platte River

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 SPCC Plan to address the handling of fuel and other hazardous materials (Appendix D Spill Prevention, Control and Countermeasure (SPCC) Plan and Emergency Response Plan (ERP), and see Appendix B, CMRP, Section 3.0, Spill Prevention and Containment).

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 Appendix B, CMRP, Section 7.11, Stabilization and Restoration of Stream Banks and Slopes).

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. Directional drilling technique may be considered in certain site-specific wetland conditions due to the presence of special-status plant or wildlife species or other factors and will be determined during the Clean Water Act Section 404 permitting process in consultation with the appropriate USFWS regional staff.

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 Inc. 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. 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 in order 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.

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 completion. For instance, Keystone would restore the land to preconstruction conditions to the extent practicable, but may leave access roads at landowner request.

2.1.10.16 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 (Table 2.1-10).

Table 2.1-10 Summary of Power Supply Requirements for the Proposed Project Pump Stations

Pump Station Number	Approximate Milepost	Transformer Size (MVA)	Utility Supply (kV)	Length (miles)	Power Provider
Montana					
PS-09	1.2	20/27/33	115	61.8	Big Flat Electric Cooperative
PS-10	49.3	20/27/33	115	49.1	NorVal Electric Cooperative
PS-11	99	20/27/33	230	0.2	NorVal Electric Cooperative

Pump Station Number	Approximate Milepost	Transformer Size (MVA)	Utility Supply (kV)	Length (miles)	Power Provider
PS-12	151.5	20/27/33	115	3.2	McCone Electric Cooperative
PS-13	203.1	20/27/33	115	15.2	Tongue River Electric Cooperative
PS-14	239.5	20/27/33	115	6.3	Montana-Dakota Utilities Company
South Dakota					
PS-15	288.6	20/27/33	115	24.5	Grand Electric Cooperative
PS-16	337.3	20/27/33	115	40.1	Grand Electric Cooperative
PS-17	391.5	20/27/33	115	10.9	Grand Electric Cooperative
PS-18	444.6	20/27/33	115	25.9	West Central Electric Cooperative
PS-19	500.4	20/27/33	115	20.4	West Central Electric Cooperative
PS-20	550.9	20/27/33	115	17.2	Rosebud Electric Cooperative
PS-21	598.9	20/27/33	115	20.1	Rosebud Electric Cooperative
Nebraska					
PS-22[a]	653.6	20/27/33	115	24	Nebraska Public Power District (NPPD) & Niobrara Valley Electric
PS-23[a]	708.2	20/27/33	115	36	NPPD & Loup valleys Rural PPD
PS-24[a]	765	20/27/33	115	9	NPPD & Southern Power District
PS-25[a]	818.4	20/27/33	69	0.1	NPPD & Perennial PPD
PS-26	875.3	20/27/33	115	0.5	NPPD & Norris PPD
Kansas					
PS-27	49	20/27/33	115	4.6	Clay Center Public Utility
PS-29	144.5	20/27/33	115	8.9	Westar Energy

[a] Pump Station locations for PS-22 through PS-25 have yet to be determined.

MVA = megavolt-amperes (million volt-amperes), kV = kilovolt.

Note: Mile posting for each segment of the proposed Project starts at 0.0 at the northernmost point of each segment and increase in the direction of oil flow.

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.

2.1.10.17 Construction Workforce and Schedule

Workforce

Keystone proposes to begin construction of the proposed Project in 2013. The proposed Project is planned to be placed into service in 2015. 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 and corresponding base of operations for construction spreads are shown on Table 2.1-6. 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.

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 clean-up 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 2.1-11). 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.

Table 2.1-11 Resulting Cross-Country Construction Times Based on Estimates of Schedule

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)

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.

2.1.10.18 Decommissioning

If decommissioning, 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.

TransCanada (the parent company of Keystone) would adopt operating procedures to address these requirements for the proposed Project as they have for previous pipeline projects including the existing Keystone Pipeline. TransCanada 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 45 miles of federal land under the management and jurisdiction of the BLM; all 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 right-of-way 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 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 the proposed Project, 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 impacts of implementing the decommissioning procedures and identify the mitigation measures required to avoid or minimize impacts.

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.

2.1.11 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 United States employees.

Keystone would implement an annual Pipeline Maintenance Program to ensure pipeline integrity. The Pipeline Maintenance 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.

2.1.11.1 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.

If Keystone would need to repair or replace a portion of the proposed pipeline or replace aboveground facilities in the ROW, Keystone would consult with agencies 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 impacts. Impacts would usually be covered under a Natural Resource Damage Assessment conducted by the United States 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. 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 (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 125 percent of the maximum operating pressure (MOP), 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.
- 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-to-date 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 in Section 2.1.11.2, Normal Operations and Routine Maintenance.

2.1.11.2 Operations

Preparing manuals and procedures for responding to abnormal operations complies with the Code of Federal Regulations, 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.

SCADA and Leak Detection

Keystone proposes to utilize 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.
- Pipeline monitoring every 5 seconds, 24 hours a day, every day of the year.

Keystone also would have a number of complimentary 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.

Emergency Response Procedures

A Project-specific ERP would be prepared for the proposed Project, which would be submitted to the Pipeline Hazardous Material 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 Appendix D (Spill Prevention, Control and Countermeasure (SPCC) Plan and Emergency Response Plan (ERP)) (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 4.14, Potential Releases, of the Supplemental EIS, 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 Parts 194 and 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.

- 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 Part 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 Appendix D (SPCC Plan and ERP).

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 (NRC) 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 NRC, 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 impacts to the community such as temporary road closings.

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 adverse impacts 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.

2.2 CUMULATIVE IMPACTS

A cumulative effects assessment (CEA) considers the residual impacts of the proposed Project in combination with the residual impacts from the connected actions and actions from other "past, present, and reasonably foreseeable future" projects, as outlined in the Council on Environmental Quality (CEQ) guidance on Considering Cumulative Effects under NEPA. Cumulative effects, by definition, are residual in nature because they occur, or continue to occur, long after project

construction is completed. In the Final EIS, the cumulative effects assessment focused on existing, under-construction, and planned linear energy transportation systems including natural gas pipelines, crude oil pipelines, and electric transmission lines; water delivery projects; and a number of energy development projects.

The CEA presented in the Supplemental EIS seeks to focus the list of projects from the Final EIS as they pertain to the proposed Project, and broaden the scope of past, present, and reasonably foreseeable future projects under consideration to include non-linear projects and other development activities with the potential to contribute to overall cumulative effects within the Project area. In addition, the Final EIS focused on projects that geographically intersected with the proposed Project; the Supplemental EIS CEA broadens the geographic boundary of the projects and activities considered to have the potential to contribute to cumulative effects. This broader perspective is provided to supplement the analysis provided in the Final EIS to support decision-making. Within this context, although geographically widely separated, the CEA also considers the potential for impacts associated with the proposed Project in combination with the TransCanada Gulf Coast Pipeline, construction which began in August 2012. This was done in response to public comment received on the scope of work for the Supplemental EIS, which indicated a concern that impacts from both projects (proposed Project plus the Gulf Coast Pipeline) would be additive, because when completed, they would be part of one larger system of crude oil transportation pipelines.

As a matter of the Department's policy, extraterritorial considerations related to the Canadian portion of the proposed Project are evaluated in the Supplemental EIS, Section 4.15.4, Extraterritorial Concerns, to the extent that the proposed Project would contribute to cumulative environmental impacts within Canada.

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 Supplemental EIS, Section 4.14, Potential Releases; for a discussion of potential cumulative effects of oil releases to the environment, see Supplemental EIS, Section 4.15.3.13, Potential Releases.

It should be noted that beneficial impacts are not addressed in the CEA. While potential beneficial impacts of proposed pipeline construction could occur in the form of increased tax revenues, the focus of the CEA is on potential adverse effects that may result from the proposed project on resources, ecosystems, and human communities. In addition, ancillary facilities in North Dakota and Kansas are not included in the CEA since the activities in these states would occur on previously developed/disturbed lands and/or are geographically small areas of potential impact relative to the proposed Project. Therefore, these facilities would have negligible contributions to overall cumulative effects.

2.2.1 Methods and Scope of the Cumulative Impacts Analysis

In general, the analysis of cumulative impacts in the CEA follows the processes recommended by CEQ (1997 and 2005) and the regulations at 40 CFR 1508.7. The scope of the CEA is governed by the geographic and temporal boundaries that correlate to the resources impacted by the proposed Project, and how the proposed Project intersects with connected actions and other projects across these resources. In general, the geographic limits of the area evaluated in the CEA can be organized into three categories:

- Project Area (PA)—Defined as the area of physical disturbance associated with the proposed Project limits; that is, in and along the pipeline ROW construction corridor and its ancillary facilities, e.g., access roads, pump stations, and construction camps.
- Local Area (LA)[5]—Defined as a 2-mile distance on either side of the proposed pipeline ROW corridor and its ancillary facilities.
- Regional (R)—Defined by the potentially impacted resource, e.g., home range of a wildlife species, bird migration corridor, or a regional airshed.

Activities within what is termed the Project Cumulative Impact Corridor (PCIC) indicate geographic proximity to the proposed Project (e.g., PA or LA as noted above). The temporal boundaries for this analysis reflect the nature and timing of the proposed Project activities as they relate to knowledge of past and present projects, and the availability of information on future projects that have a high probability of proceeding. For any given project, the duration of potential impacts is typically categorized as temporary, short-term, long-term, or permanent.

Temporary impacts are generally expected to occur during construction, with the resources returning to pre-construction conditions almost immediately afterward. Short-term impacts are defined as those that would continue for approximately 3 years following construction. Long-term impacts are those where the resource would require greater than 3 years to recover. Permanent impacts occur as a result of activities that modify resources to the extent that they would not return to pre-construction conditions during the design life of the proposed Project (50 years), such as with construction of aboveground structures.

When considering the broad scope of evaluating the combined effects of past, present, and reasonably foreseeable future projects, it is the long-term and permanent impacts of individual projects that would have the greatest potential to combine with one another to create significant cumulative impacts. Therefore, the primary focus of this CEA is to gain an understanding of the potential combined long-term or permanent impacts to resources, ecosystems, and human communities from the proposed Project, connected actions and other past, present, and reasonably foreseeable future projects (federal, non-federal, and private actions). Temporary and/or short-term impacts, which could occur concurrently (geographically and temporally) between the proposed Project, connected actions, and other projects to produce short term cumulative impacts, are considered qualitatively.

Key factors in controlling the temporal scale of cumulative effects are several measures designed to mitigate, offset, and/or restore impacted resources to pre-construction conditions. Keystone's CMRP (see Appendix B, CMRP) recommended additional mitigations, individual federal and state agency permitting conditions, and/or existing laws and regulations that all function to control potential impacts and reduce long-term and permanent effects. Therefore, the CEA incorporates the implementation of these measures in the evaluation of anticipated resource impacts, specifically as they affect the duration of impacts and their potential to contribute

[5] Correlates to the socioeconomic analysis area as defined in Supplemental EIS Section 3.10, Socioeconomics.

significantly to cumulative effects. The attribution of significance requires the assessment and integration of a number of lines of evidence:

- The effectiveness of mitigation measures or other embedded controls.
- The geographic context of where the activities are taking place (e.g., pristine land versus previously disturbed areas).
- The degree to which residual impacts on a local scale are additive with similar impacts from other projects and activities, and their magnitude (i.e., relative contribution).

This analysis is enhanced through the use of GIS mapping, which is presented where applicable.

The sections of the CEA are organized as follows:

- Section 2.2.2, Past, Present, and Reasonably Foreseeable Projects: This section evaluates reasonably identifiable federal, state, local, and private projects and/or development activities based on publicly available information with possible effects that could be temporally and/or geographically coincident with those of the proposed Project on Federally Protected and Candidate Species Cumulative Impacts. The discussion in this section is organized by the project/activity timeframe: past, present or future, with an accompanying table listing the identified project/activity. Connected actions to the proposed Project are presented separately following the other future project/activity descriptions.
- Section 2.2.3, Federally Protected and Candidate Species Cumulative Impacts: This section discusses the potential cumulative impacts of the proposed Project and other actions on Federally Protected and Candidate Species Cumulative Impacts, along with any pertinent mitigation actions, and how these anticipated cumulative impacts interact with the other past, present, and reasonably foreseeable future projects/activities described in Section 2.2.2.

2.2.2 Past, Present, and Reasonably Foreseeable Projects

The proposed Project would occur in locations that include numerous existing, under-construction, and planned major capital public and private projects, including oil and gas well fields, major product pipelines, water distribution lines, energy development projects (including wind farms) and associated electric transmission lines, and mining projects. The identification of the projects and/or activities to be included in the cumulative impact analysis was accomplished through independent research, beginning with review of the PHMSA National Pipeline Mapping System (https://www.npms.phmsa.dot.gov/). This was followed by queries of the Montana, South Dakota, and Nebraska state government websites, and private company websites providing publicly available data and details on projects and activities within the geographic boundaries of interest. Please see Appendix E (Past, Present, and Reasonably Foreseeable Future Project Descriptions) for a more detailed description of the projects identified, as well as a complete list of the data sources accessed for the CEA.

Past projects and activities considered in the CEA are those that have been completed and their physical features are part of the current/existing landscape. Residual (i.e., permanent) effects from these projects/activities are considered to be potentially cumulative with the effects of the proposed Project. These projects are further described in Table 2.2-1. Unless otherwise noted, it is assumed the impacts of these projects are reflected in existing environmental conditions as described in the Supplemental EIS Chapter 3, Affected Environment.

Table 2.2-1 Representative Past Projects Considered in the Cumulative Effects Assessment

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Crude Oil Pipelines and Storage Facilities			
Express-Platte Pipeline System	Two pipelines: the Express has been in operation since 1997, the Platte since 1952. Approximately 1,700 miles total of crude oil pipelines that are 20 (Platte) and 24 (Express) inches in diameter.	Southeastern Alberta; central Montana; northeastern Wyoming; south-central Nebraska; northeastern Kansas; north-central Missouri.	The Express-Platte system would be within the PCIC for the proposed Project near Steele City, Nebraska.
Keystone Mainline Oil Pipeline	Approximately 1,379-mile-long crude oil pipeline has a design capacity between 435,000 barrels per day (bpd) to 591,000 bpd.	Southeastern Alberta; southern Saskatchewan; southwestern Manitoba; eastern North Dakota; eastern South Dakota; eastern Nebraska; northeastern Kansas; central Missouri; central Illinois.	The Keystone Mainline Oil Pipeline would be within the PCIC near Steele City, Jefferson County, Nebraska.
Keystone Cushing Extension	298-mile-long, 36-inch-diameter crude oil pipeline from Steele City, Nebraska, to Cushing, Oklahoma.	Southern Nebraska; central Kansas; central Oklahoma.	The northern portion of the Cushing Extension would be within the PCIC in Steele City, Jefferson County, Nebraska.
True Company Pipelines and Crude Oil Storage Facility	A system of more than 3,400 miles of crude oil gathering and transportation pipelines, including Bridger Pipeline, LLC that owns and operates the Poplar, Little Missouri, Powder River, Butte, Belle Fourche, Four Bears, Parshall, and Bridger pipeline systems. Three collector pipelines to transport production from the north, west, and east into the Butte Pipeline near Baker are under construction.	Throughout Wyoming; eastern Montana; western and central North Dakota.	Portions of the pipeline systems owned and operated by True Companies would be within the PCIC in near Baker, Fallon County, Montana.
Refined/Finished Product Pipelines			
Cenex Pipeline	8-inch products pipeline running from Fargo, North Dakota, at Williams Pipeline Terminal to Laurel Station at the Cenex Refinery in Montana.	Western North Dakota and eastern Montana.	Within PCIC in southwestern Dawson County, Montana.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Magellan Pipeline	Total of 9,600 miles of refined product pipelines, including 50 terminals (four in Nebraska) and seven storage facilities.	The Magellan Pipeline system is located in the following states: North Dakota, Minnesota, South Dakota, Nebraska, Colorado, Iowa, Illinois, Missouri, Kansas, Oklahoma, Arkansas, and Texas.	Magellan Pipeline crosses the PCIC in southern York County, Nebraska.
NuStar Pipeline	Central East Region—East Refined Products Pipeline system transports refined petroleum products, including gasoline, diesel, and propane. The system includes 2,530 miles of pipelines that transport an average of 203,000 bpd and 21 distribution terminals (five in Nebraska, five in South Dakota) with a storage capacity of 4.8 million barrels.	Pipeline system runs north-south from central North Dakota to eastern South Dakota, western Iowa, eastern Nebraska, southern Nebraska, central Kansas.	NuStar Pipeline is within the PCIC in Fillmore and York counties, Nebraska.
Natural Gas Pipelines			
Williston Basin Interstate Pipeline Company System	A 3,364-mile-long natural gas pipeline transmission system.	Pipeline system runs through Montana, North Dakota, Wyoming, and South Dakota.	Portions of the Williston Basin System would be within the PCIC in Valley and Fallon counties, Montana and Harding County, South Dakota.
Northern Border Pipeline	A 1,249-mile-long interstate natural gas pipeline with a design capacity of approximately 2.4 billion cubic feet of gas per day (bcf/d).	Pipeline runs generally northwest to southeast through Montana, North Dakota, South Dakota, Minnesota, Iowa, Illinois, and Indiana.	Portions of the Northern Border Pipeline would be in the PCIC in Phillips and Valley counties, Montana, and would be near and parallel to the proposed Project for approximately 21.5 miles.
Northern Natural Gas	14,900 miles of pipeline, operational since 1930, 2- to 36-inch diameter. 2,357 receipt and delivery points.	Minnesota, Wisconsin, Michigan, Iowa, South Dakota, Nebraska, Kansas, Oklahoma, Texas, and New Mexico.	The Northern Natural Gas Pipeline system is within the PCIC in Jefferson and Saline counties, Nebraska.
Rockies Express West (REX-W)	A 713-mile-long 42-inch-diameter interstate natural gas transmission pipeline with a capacity of approximately 1.5 bcf/d. The project includes five compressor stations.	Colorado, Wyoming, southern Nebraska, northeastern Kansas, Missouri, Illinois, Indiana, and Ohio.	REX-W is within the PCIC in a generally west-to-east direction in the vicinity of Steele City, Nebraska.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Bison Natural Gas Pipeline	A 302-mile-long, 30-inch-diameter pipeline with a capacity of 500 million cubic feet per day (MMcf/d). Pipeline system and related facilities that extend northeastward from the Dead Horse Region near Gillette, Wyoming, through southeastern Montana and southwestern North Dakota where the system connects with the Northern Border Pipeline system near Northern Border's Compressor Station No. 6 in Morton County, North Dakota. 407 MMcf/d capacity currently; with compression (approved but not yet built) capacity will be approx. 477 MMcf/d , with potential expandability to approx. 1 bcf/d.	Southwestern North Dakota, southeastern Montana, and northeastern Wyoming.	The Bison pipeline intersects the PCIC in southern Fallon County, Montana.
Kinder-Morgan Interstate Gas Transmission (KMIGT)	Approximately 5,100 miles of transmission lines in Colorado, Kansas, Nebraska, Michigan, and Wyoming. The Huntsman natural gas storage facility, located in Cheyenne County, Nebraska, with approx. 10 billion cubic feet of firm capacity commitments is also part of the system.	Transmission system comprised of West zone (central Wyoming); Central zone (southeastern Wyoming, southwestern Nebraska, and northeastern Colorado); East-North zone (southern and eastern Nebraska); and East-South zone (northwestern Kansas).	KMIGT within the PCIC in the following counties: northern Fillmore County, Nebraska; central York County, Nebraska; eastern Boone County, Nebraska; eastern Antelope County, Nebraska; and northern Holt County, Nebraska.
Trailblazer Pipeline	436 miles of 36-inch pipe. Certificated capacity of 522,000 decatherms/day (Dth/day). Expansion planned: Expand by 324,000 Dth/day to bring total capacity to 846,000 Dth/day.	Runs generally east-west from Cheyenne, Wyoming along the Wyoming/Colorado border through southern Nebraska.	Trailblazer Pipeline crosses the PCIC in southern Saline County, Nebraska.
Natural Gas Pipeline Co. of America—Amarillo Line	Total network: 10,000+ miles of pipelines, 265 billion cubic feet of working gas storage capacity. Amarillo Line (based on 2002 stats) produces 1.6 bcf/d.	Runs generally northeast to southwest from Chicago, Illinois through southern Iowa, across southeast Nebraska (at Steele City), central Kansas, western and southern Oklahoma, northwestern Texas, and southeastern New Mexico.	NGPL line is within the PCIC at Steele City, Jefferson County, Nebraska.
Central City Gas System	Natural gas pipeline system owned and operated by the city of Central City, Nebraska. 2- to 6-inch-diameter transmission line.	Serves Central City, Nebraska.	Central City Gas Pipeline system is within the PCIC in southwestern Polk County, Nebraska.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
SourceGas LLC	SourceGas—Nebraska transmission system consists of approximately 5,000 miles of transmission and distribution pipeline in 57 counties across Nebraska. The system has interconnections with or laterals off the KMIGT, Pony Express, and Trailblazer pipelines.	Serves the western 2/3 of Nebraska.	SourceGas pipelines within the PCIC in northwestern Holt County, Nebraska and southeastern Boone County, Nebraska.
Ammonia Pipelines			
NuStar Pipeline	2,000 miles total, ranging from 4- to 10-inch carrying anhydrous ammonia, with a terminal at Aurora, Nebraska	Pipeline extends through Indiana, Illinois, Missouri, Arkansas, Louisiana, and Nebraska. Specific cities impacted in Nebraska: Blair, Fremont, and Aurora.	Anhydrous ammonia pipeline is within the PCIC in northwestern York County, Nebraska.
Water Delivery Systems			
Perkins County Rural Water System	Extension of Southwest Pipeline from Lake Sakakawea, North Dakota.	Map of pipeline or system area not readily available; however, project is in Perkins County, South Dakota.	Project route is through southwestern Perkins County, South Dakota. Water pipeline possibly within the PCIC depending on location.
Electrical Transmission Lines			
345-499-kV Transmission Lines	The U.S. electric grid consists of independently owned and operated power plants and transmission lines.	The transmission lines affect the entire United States.	Transmission lines would affect the PCIC in Boyd, Antelope, Boone, Holt, Nance, Merrick, Hamilton, York, Fillmore, and Jefferson counties in Nebraska. The PCIC would also be affected in Fallon and McCone counties in Montana. In South Dakota, the PCIC is affected in Perkins, Meade, Haakon, and Jones counties.
Railroads			
Union Pacific Railroad (UP)	The UP spans 31,900 miles and is the largest railroad network in the United States.	The UP operates in 23 states throughout the central and western United States.	Rail is within the PCIC in Jefferson and Merrick counties, Nebraska.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Burlington Northern Santa Fe Railway (BNSF)	BNSF owns rail lines running through multiple areas of Montana, primarily east-west along the northern border; northwest to southeast across the central portion of the state; and southwest to northeast in the southeastern portion of the state. BNSF-owned lines also run generally northwest to southeast across Nebraska, with heavier rail line concentration around Lincoln.	The BNSF railway operates throughout the central and western United States.	The railway falls within the PCIC in Fillmore and York counties, Nebraska and the following counties in Montana: Baker, Prairie, Dawson, and McCone.
Nebraska Central Railroad Company (NCRC)	The NCRC operates over 340 miles of track on three lines concentrated northwest of Lincoln.	The NCRC operates in northeastern and central Nebraska.	Rail is within the PCIC in Polk, Nance, and Boone counties, Nebraska.
Nebraska Northeastern Railway Company (NNRC)	The NNRC operates on approximately 120 miles of northeastern Nebraska. Runs generally east-west across northeastern Nebraska from the Missouri River to O'Neill, Nebraska.	The NNRC operates in northeastern Nebraska.	Rail is within the PCIC in Antelope County, Nebraska.
Canadian Pacific/ Dakota, Minnesota & Eastern	A 574-mile line that runs north-south along the western South Dakota border and east-west through central South Dakota.	Western and central South Dakota.	Rail is within the PCIC in Haakon County, South Dakota.
South Dakota Owned/ Dakota Southern Operated	A 190-mile line that runs generally east-west across south-central South Dakota.	South-central South Dakota.	Within the PCIC in Jones and Valley counties, South Dakota.
Wind Farms			
Diamond Willow Windfarm	Operated by Montana-Dakota Utilities (MDU). The first phase began commercial operation in 2008. Expanded in 2010, for a total capacity of 30 megawatts (MW), by 20 General Electric 1.5 MW turbines.	South of Baker, Montana in Fallon County.	Potentially within the PCIC in Fallon County (Baker), Montana.
Laredo Ridge	7,600 acre site. Approximately 3 miles northeast of Petersburg, Nebraska, in Boone County, Nebraska. 81 MW capacity.	North of Petersburg, Nebraska, in northern Boone County, Nebraska.	Possibly within the PCIC in Boone County, Nebraska.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Landfills			
City of Baker	Closed landfill, located approximately 2 miles southwest of the city of Baker, Montana.	Baker, Fallon County, Montana.	Closed landfill is within the PCIC near Baker, Fallon County, Montana.
Town of Nashua	Closed Class III Landfill located approximately 2 miles west of the town of Nashua, Montana.	Nashua, Valley County, Montana.	Closed landfill is within the PCIC near Nashua, Valley County, Montana.
City of O'Neill	Waste disposal area for construction and demolition debris, generally described as the SE 1/4 Nebraska 1/4 Section 29 Township 29 North Range 11 West of the 6th Principal Meridian, located in the City of O'Neill, Nebraska.	O'Neill, Holt County, Nebraska.	Landfill is potentially within the PCIC.
Power Plants			
Nebraska Public Power District (NPPD) Petroleum Plant	The NPPD operates a Mobile Petroleum Plant within York, Nebraska. This plant provides a maximum of 3.1 MW of electricity generated from petroleum to the surrounding residential and industrial facilities.	York, Nebraska.	Within the PCIC in York, Nebraska.
Grazing Land			
Montana Grazing Lands	The state of Montana has extensive lands used by ranchers for the grazing of herds of animals.	Multiple	Grazing lands would fall within the PCIC in Valley, McCone, Dawson, Prairie, and Fallon counties.
South Dakota Grazing Lands	The use of lands for grazing herds of animals is widespread in the state of South Dakota.	Multiple	The PCIC would be affected by grazing lands in Harding, Butte, Perkins, Meade, Haakon, Jones, and Tripp counties.
Nebraska Grazing Lands	The state of Nebraska has extensive lands used by ranchers for grazing herds of animals.	Multiple	Grazing lands would fall within the PCIC in Keya Paha, Boyd, Holt, Antelope, Boone, Nance, Merrick, Polk, York, Fillmore, Saline, and Jefferson counties.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Oil and Gas Storage Facilities			
Baker Facility	Natural gas storage facility in Baker, Fallon County, Montana. Owned and operated by Williston Basin Interstate Pipeline Company, with a total capacity of 287.2 billion cubic feet.	Baker, Fallon County, Montana.	Baker natural gas storage facility is within the PCIC near Baker, Fallon County, Montana.
Oil and Gas Well Fields			
Wildcat and Buffalo	Oil and gas wells in central South Dakota.	Central South Dakota and northwestern Harding County, South Dakota.	Oil and gas wells within the PCIC in northwestern Tripp County, South Dakota; southeastern Jones County, South Dakota; south-central Jones County, South Dakota; northwestern Harding County, South Dakota; and north-central Meade County, South Dakota.
Wildcat Phillips, Fallon, Valley, McCone County fields	Oil and gas fields in Montana.	Southeastern Fallon County, southwestern Dawson County, southeastern McCone County, eastern Valley County, northeastern Phillips County, Montana.	Oil and gas wells within the PCIC (Gas Light, Plevna, Plevna South, Cedar Creek, Weldon, McCone, and Wildcat) in southeastern Fallon County, southwestern Dawson County, southeastern McCone County, Valley County, northeastern Phillips County, Montana.
Mine and Mineral Extraction Sites			
Montana gravel pits	Active surface gravel pits.	Southern Valley County, Southeastern McCone County, Montana.	Gravel pits within the PCIC through southern Valley County, Montana.
Weldon Timber Creek Coal Field	Active surface coal field in northwestern McCone County, Montana.	Northwestern McCone County, Montana.	Coal field within the PCIC through northwestern McCone County, Montana.
Abandoned coal fields	Eighteen abandoned coal fields.	Northwestern and southeastern McCone County, western and southwestern Dawson County, Montana.	Abandoned coal fields within the PCIC through northwestern and southeastern McCone County, western and southwestern Dawson County, Montana.
Fallon County Bentonite Deposit	Active bentonite surface mine in southeastern Fallon County, Montana.	Southeastern Fallon County, Montana.	Active bentonite mine within the PCIC through southeastern Fallon County, Montana.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Fallon County abandoned surface mines and coal fields	One abandoned coal field and five abandoned surface mines in southeastern Fallon County, Montana.	Southeastern Fallon County, Montana.	Abandoned coal field and surface mines within the PCIC through southeastern Fallon County, Montana.
Nebraska active sand and gravel mines	Active sand and gravel mines in Nebraska.	Northeastern Keya Paha County, northern and central Holt County, southern Jefferson County, Nebraska.	Active sand and gravel mines within the PCIC.
Nebraska abandoned sand and gravel pits	Abandoned sand and gravel pits in Nebraska.	Eastern Boyd County, northern and central Holt County, central and southern Antelope County, southern York County, eastern Fillmore County, southern Jefferson County, Nebraska	Abandoned sand and gravel pits within the PCIC in northern and central Holt County, Nebraska.
Nebraska inactive sand and gravel pits	Inactive sand and gravel pits in Nebraska.	Southern Jefferson County, Nebraska.	Abandoned sand and gravel pits within the PCIC.
South Dakota active sand and gravel pits	Active sand and gravel pits in South Dakota	Southeastern and central Tripp County, southeastern Haakon County, eastern Haakon County, northeastern Meade County, northwestern Harding County, South Dakota	Active sand and gravel pits within the PCIC.
South Dakota inactive sand and gravel pits	Inactive sand and gravel pits in South Dakota	Southeastern Tripp County, central Jones County, southeastern Haakon County, northeastern Meade County, South Dakota	Inactive sand and gravel pit within the PCIC.
Nebraska Feedlots	A feedlot is a type of animal feeding operation which is used in farming. Very large feedlots are classified as concentrated animal feeding operations (CAFOs), and are used to increase the size of livestock before slaughter.	Feedlots are used in across the state of Nebraska and have an impact throughout.	The PCIC of the proposed pipeline route would be affected by large feedlots, or CAFOs, southwest of Naper, north of Atkinson, northeast of O'Neill, east of Page, near Orchard, west of Tilder, north of Clarks, near McCool Junction, and near Milligan, Nebraska.
Mt. Echo Feedlot and Beaver Valley Pork	Additional CAFOs	Feedlots are used across the state of Nebraska and have an impact throughout.	The Mt. Echo feedlot falls within the PCIC near St. Edward, Nebraska. The Beaver Valley Pork feedlot falls within the PCIC near St. Edward, Nebraska.

Project Name	Description	Regions Impacted	Geographic Relationship to Proposed Project
Grain and Agronomy Hubs			
Central Valley Agriculture (CVA)—multiple locations	The CVA Clarks location is an agronomy hub that offers fertilizers, chemicals, insecticides, seed and seed treatments, custom application, and precision technology and scouting services to the agricultural sector in central Nebraska.	CVA is located throughout central Nebraska and affects multiple localities in Nebraska.	This CVA Clarks location falls within the PCIC for the proposed Project. The location of the agronomy hub is 2947 26th Road, Clarks, Nebraska

A summary of the residual impacts associated with the general types of projects listed in Table 2.2-1 as well as the potential for these residual effects to be cumulative with the effects of the proposed Project is presented below. While some residual effects associated with past projects may be long-term and/or permanent, many of the residual effects of past projects and effects of the proposed Project are localized. In these situations, the greatest potential for cumulative effects across a broad range of resources from the proposed Project occurs where there is geographic proximity of past projects with the proposed Project. Where appropriate, such as greenhouse gas emissions and effects to federally protected or candidate species, cumulative effects are considered across a larger geographic scale.

2.2.3 Federally Protected and Candidate Species Cumulative Impacts

A detailed cumulative impact assessment is provided in the Final EIS and Supplemental EIS. It should be noted that the potential for a given impact to contribute to cumulative impacts is based on the assumption that the CMRP (Appendix B) is successful and near pre-construction conditions are restored and maintained within the anticipated timeframes.

A number of federally protected or candidate species, under consideration potentially occur in the proposed Project vicinity. These species include 2 mammals, 6 birds, 2 fish, 1 invertebrate, and 2 plants (Table 1.3-1). Further review of these 13 species indicates that the proposed Project would likely adversely affect 1 species, would not likely adversely affect 8 species with implementation of proposed conservation measures, and would have no effect on 4 species. Of the 2 federal candidate species identified within the proposed Project vicinity, it has been determined that the habitat would likely be disturbed or altered.

As indicated in Table 2.2-2, the anticipated overall absence of long-term and permanent impacts to most federally protected or candidate species resources from the proposed Project indicates that cumulative effects to these species are expected to be minimal.

Table 2.2-2 CEA Matrix—Threatened, Endangered, and Candidate Species

Potential Species Impacted [(1)(2)(3)]	Proposed Project and Connected Action Impacts		Geographic Extent	Cumulative Impact Potential (Yes/No)
	Construction	Operation		
Mammals:				
Black-footed ferret (*Mustela nigripes*)	(I)	(I)	PA	No
Gray wolf (*Canis lupus*)	(I)	(I)	LA	No
Birds:				
Eskimo curlew (*Numenius borealis*)	N	N	*	No
Greater sage-grouse (*Centrocercus urophasianus*)	(D)	(I)	R	No
Least tern (*Sterna antillarum*)	(I)	(I)	LA	No
Piping plover (*Charadrius melodus*)	(I)	(I)	LA	No
Sprague's pipit (*Anthus spragueii)*	(I)	(I)	LA	No
Whooping crane (*Grus americana*)	(I)	(D)	LA	Yes
Fish:				
Pallid sturgeon (*Scaphirhynchus albus*)	(I)	(I)	PA	No
Topeka shiner (*Notropis topeka*)	(I)	(I)	PA	No
Invertebrates:				
American burying beetle (*Nicrophorus americanus)*	(D)	(D)	LA	Yes
Plants:				
Blowout penstemon (*Penstemon haydenii)*	(I)	(I)	LA	No
White fringed prairie orchid (*Platanthera praeclara)*	(D)	(I)	LA	No

Duration of Impact

—Negligible

—Temporary/Short Term (<3 yr.)

—Long-Term (>3 yr.)

—Permanent

Type of Impact

N —Negligible Impact

D —Direct Impact

I —Indirect Impact

Notes: Parentheses around impact indicates that it would be addressed by implementation of Keystone's Construction, Mitigation, and Reclamation Plan, additional mitigations, and/or existing laws and regulations.

Geographic Extent of Potential Impact

Project Area (PA)—Defined by limits of ROW and ancillary facilities, e.g., access roads, pump stations, and construction camps.

Local Area (LA)—Defined as a 2-mile distance on either side of the pipeline ROW and ancillary facilities.

Regional (R)—Defined by resource, e.g., home ranges of wildlife species, bird migration corridor, regional airshed, etc.

Conservation efforts implemented to offset potential losses would reduce the cumulative impacts associated with the proposed Project. Any future projects in the area that reduce and fragment preferred habitat for the American burying beetle may provide the potential for additive cumulative effects to this species. Any additional potential losses would likely require similar conservation measures and mitigations, thus reducing overall cumulative impacts on the American burying beetle.

The majority of the potential Project effects to federally protected or candidate species resources would be indirect, short term or negligible, limited in geographic extent, and associated with the construction phase of the proposed Project only. Indirect and short-term impacts associated with construction of the proposed Project may include reduced species use due to increased human interaction; habitat fragmentation, alteration, and loss; stress and reduced breeding success due to noise, vibration, and human activity; creation of barriers to movement; and reduction in patch size of available habitat. Thus, there is limited potential for cumulative effects of these impacts to be cumulative with other projects; however, additional discussion of federally protected and candidate species is presented below.

Incremental impacts to streams and riparian habitats from future linear project construction and the accidental spread of exotic aquatic invasive plants and animals could increase cumulative impacts to federally protected and candidate species habitat. Increased competition from invasive species could contribute to cumulative impacts to native freshwater mollusks and prairie stream fishes which have been increasingly recognized as vulnerable. Multiple stream and wetland crossings, especially those associated with small clear springs and streams or freshwater mussel beds, could result in impacts to habitat quality that could in conjunction with the impacts of the proposed Project affect federally-protected aquatic species of conservation concern. The spread of invasive plants could also result in cumulative habitat impacts to federally protected plants, if present.

The proposed Project could potentially affect four federally protected or candidate migratory birds (whooping crane, piping plover, interior least tern, and Sprague's pipit) within their migration range from Nebraska to Montana and/or within their breeding habitats. Conservation measures proposed for three of these birds (i.e., whooping crane, piping plover, and interior least tern) include protection of river and riparian nesting and migration staging habitats through use of HDD crossing methods and site-specific surveys to avoid disturbance to migration staging, nesting, and brood-rearing individuals. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize effects to these birds.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for the four federally protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds, including the greater sage-grouse (although not a migratory bird), interior least tern, piping plover, and Sprague's pipit.

Impacts to federally protected and candidate species from the construction and operation of the connected actions (Bakken Marketlink Project, Big Bend to Witten 230-kV Transmission Line, and Electrical Distribution Lines and Substations) would be long term or permanent. The greater sage-grouse, Sprague's pipit, and federally protected species may be impacted by habitat loss

resulting from construction of the Bakken Marketlink Project, along with future projects in the area that reduce and fragment preferred habitat for these species. However, habitat loss would be mitigated and any additional potential habitat loss would likely require similar conservation measures and mitigations, thus reducing overall cumulative impacts on these species.

The transmission line, electrical distribution lines, and substations could result in long-term increased bird collisions, bird predation, and habitat loss. However, with implementation of conservation measures, it is not expected that these lines would have cumulative impacts on birds protected under the MBTA or Bald and Golden Eagle Protection Act.

Other past, present, and foreseeable future projects in South Dakota (as indicated on Figure 2.2.3-1) are relatively sparse with significant geographic separation. However, American burying beetle locations in Nebraska (Figure 2.2.3-2) occur within the proposed Project and several other projects in proximity to these locations. Furthermore, potential impacts to the American burying beetle are associated with the concurrent construction of the TransCanada Gulf Coast pipeline project. Construction of new pipelines or other ground disturbing projects through southern South Dakota and north-central Nebraska could contribute to cumulative mortality and loss of habitat. Any additional potential losses within this species would likely require conservation measures, thus reducing overall cumulative impacts on the American burying beetle.

Past cumulative effects for federally protected and candidate species present near the proposed Project have included habitat loss, alteration, and fragmentation primarily due to agricultural, silvicultural, industrial, urban, and suburban development; reduced water quantity and blockage of fish migrations from impoundment and diversion for agricultural or urban use; and reduced water quality from degradation of riparian habitats and contamination from agricultural, industrial, urban, and suburban runoff. Such cumulative impacts have led to the overall decline and resulting determinations for these species that occur within the proposed Project vicinity.

Implementation of appropriate conservation measures as determined through consultations with federal and state agencies for federally protected and candidate species for the proposed Project would include impact avoidance, minimization, and habitat restoration and compensation to ameliorate long-term cumulative impacts. Proposed Project restoration includes restoration of native vegetation and soil conditions and prevention of spread and control of noxious weeds for 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. These conversions are not expected to adversely affect or contribute to cumulative impacts for any federally protected and candidate species.

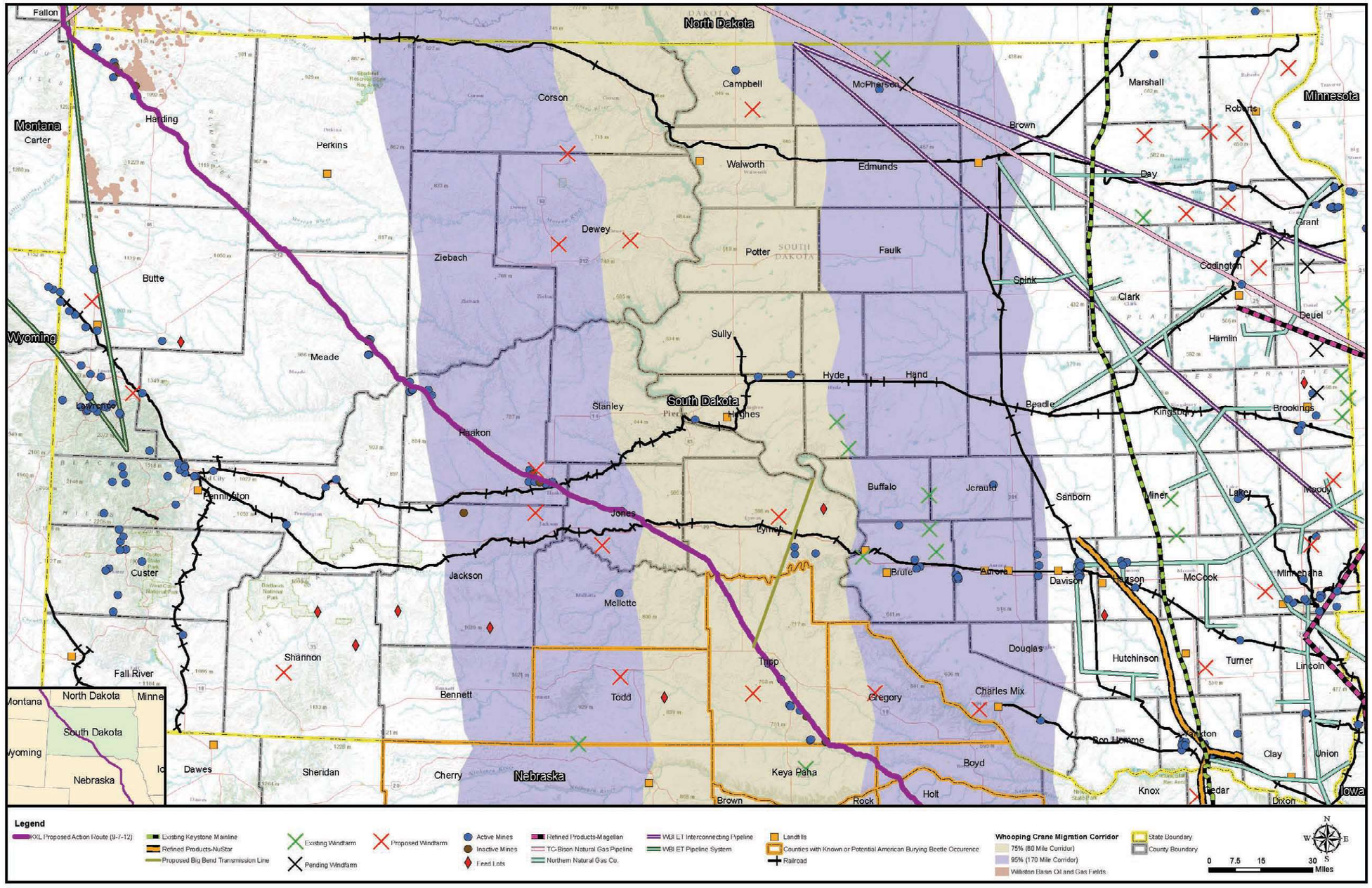

Figure 2.2.3-1 Known Locations of Past, Present, and Reasonably Foreseeable Future Projects in South Dakota with American Burying Beetle Areas of Potential Occurrence and Central Flyway Whooping Crane Migration Corridor

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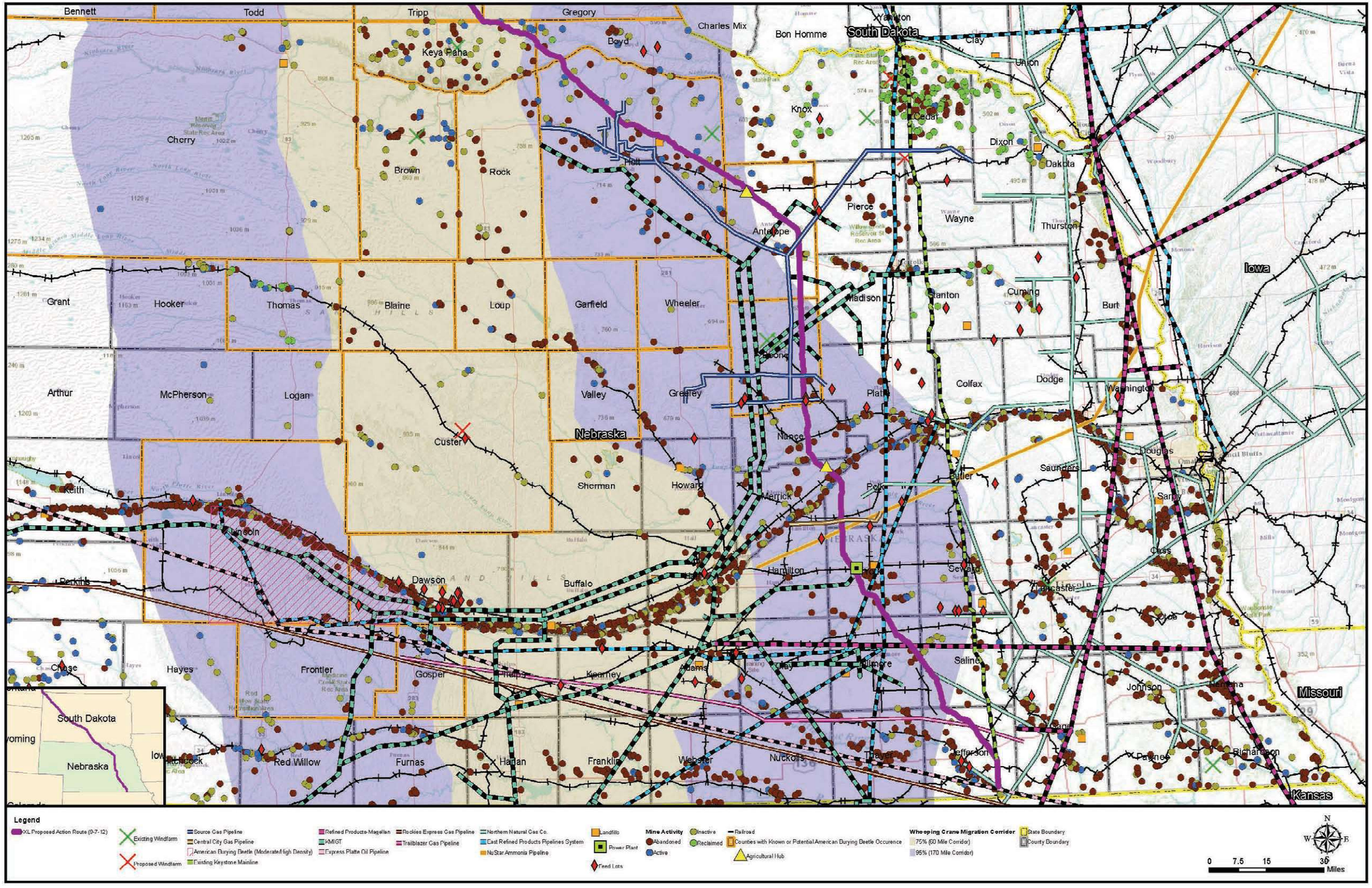

Figure 2.2.3-2 Known Locations of Past, Present, and Reasonably Foreseeable Future Projects in Nebraska with American Burying Beetle Areas of Potential Occurrence and Central Flyway Whooping Crane Migration Corridor

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3.0 SPECIES EVALUATION

3.1 FEDERALLY ENDANGERED

3.1.1 Black-footed Ferret– Endangered/Experimental Populations

3.1.1.1 Natural History and Habitat Association

The black-footed ferret (*Mustela nigripes*) was federally listed as endangered on March 11, 1967 (32 FR 4001) under the Endangered Species Preservation Act of October 15, 1966 (80 Stat. 926; 16 United States Code [USC] 668aa(c)). Listing for the black-footed ferret was revised under the Endangered Species Act on June 2, 1970 (35 FR 8491). Designated non-essential experimental populations were reintroduced to sites in Wyoming, South Dakota, Montana, Arizona, and Colorado between 1991 and 2003; other non-designated reintroductions have occurred in South Dakota, Arizona, Kansas, Montana, and Mexico between 2001 and 2008 (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)). Members of reintroduced populations within the species historic 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 black-footed ferret was considered extinct by the middle of the last century until it was documented in South Dakota in August 1964 (Fortenbery 1972, Hillman 1968, Henderson et al. 1969, Linder et al. 1972) and again in 1981 near Meeteetse, Wyoming (Fitzgerald et al. 1994, USFWS 1988a). However, the South Dakota population subsequently disappeared and the Wyoming population declined to only a few remaining individuals. The remaining animals in the wild were captured and provided the basis for the 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, and the captive black-footed ferret population is the primary species population. Sustainable ferret populations are exclusively dependent on black-tailed prairie dog colonies for food and habitat. Any black-tailed prairie dog towns exceeding 80 acres in size or any towns that are part of a >1,000-acre complex of prairie dog colonies may be considered black-footed ferret habitat, and surveys for ferrets may be required prior to any construction through colonies meeting the above criteria.

Non-essential experimental populations of black-footed ferrets have been established in several large colonies of black-tailed prairie dogs in South Dakota and Montana. In the unlikely event that future reintroduced ferrets would occur within the project area, take of these animals would not be permitted. However, land use activities in the non-essential experimental area would not be limited by the presence of any black-footed ferrets located therein. Currently 18 reintroduced populations are in Montana, South Dakota, Wyoming, Colorado, Utah, Arizona, Kansas, New Mexico, and Mexico (USFWS 2008b). No critical habitat has been designated for this species.

Black-footed ferrets are primarily nocturnal, solitary 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). Black-footed ferrets typically breed from March to May (USFWS 1988a). The gestation period ranges from 41 to 45 days, with as many as 5 young born in late May and early June. The kits remain underground until late June or early July; upon emerging, they may accompany the female during nocturnal foraging. Male ferrets are not active in rearing the young and live a solitary life except during the breeding season. 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 habitat modification due to disease (USFWS 2008b).

3.1.1.2 Potential Presence in Project Area

The proposed Project crosses the historic range of the black-footed ferret in Montana, South Dakota, and Nebraska. Black-footed ferrets are not known to exist outside reintroduced populations in the western United States. Eleven reintroductions of black-footed ferrets have occurred in Montana, South Dakota, and Kansas; these were outside the previous Keystone XL ROW (USFWS 2008b). Natural Heritage Program data for Montana and South Dakota (Montana Natural Heritage Program 2008, SDGFP 2008) contains no historical records of black-footed ferrets within 5 miles of the proposed ROW.

During the meeting with Keystone representatives on May 5, 2008, the USFWS Grand Island Ecological Services Field Office indicated that ferrets do not occur within the original Keystone XL Project area in Nebraska and proposed Project impacts would be negligible. In 2012, the USFWS affirmed that the proposed Project area in Nebraska lacks suitable habitat and therefore was unlikely to impact the ferret (USFWS 2012b). According to the USFWS Pierre Ecological Services Field Office, black-tailed prairie dog towns in the entire state of South Dakota 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).

Since the black-footed ferret is dependent on prairie dogs, the assessment of potential impacts to experimental populations was focused on black-tailed prairie dog colonies and complexes that would be affected by construction of the proposed Project. The proposed route does not occur within the known ranges of the Gunnison's prairie dog or 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. During the 2008 surveys, one potential prairie dog town was identified near Milepost (MP) 65.6 in Valley County, Montana, 570 feet from the previous proposed Project route. Subsequent surveys determined that this town was occupied by Richardson's ground squirrel (*Urocitellus richardsonii*), and possibly black-tailed prairie dogs, although none were observed. The proposed

Project route avoids this colony, due to a Montana Department of Environmental Quality (MDEQ) route modification incorporated into the proposed Project.

The eight prairie dog towns found along the proposed Project in South Dakota and Nebraska 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 2008c) and/or there is no suitable habitat available for the black-footed ferret. All prairie dog towns within the Project ROW are unsuitable for the reintroduction of the black-footed ferret, and there are no currently existing black-footed ferret populations within the ROW (USFWS 2011).

3.1.1.3 Impact Evaluation

Construction

Direct impacts to black-footed ferrets as a result of construction would include increased habitat loss, habitat fragmentation, and potential injury or mortality if black-footed ferrets are present within the construction area. Indirect impacts would include disturbance and displacement due to increased noise and human presence during construction; reduced habitat availability due to destruction or disturbance of cover habitat in prairie dog towns, and reduced prey availability due to mortality or reduced reproduction of black-tailed prairie dogs.

One potential black-tailed prairie dog colony was identified in 2008 as being crossed by the previous proposed Project ROW in Montana (AECOM 2009c); however, this colony is too small to support black-footed ferrets (USFWS 2011) and is also avoided by the proposed route. It is unlikely that the proposed Project would have an adverse effect on black-footed ferrets given the lack of suitable habitat in the proposed Project area.

Operations

Routine operation of the proposed Project is not expected to affect black-footed ferrets or their 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 would have negligible effects on the black-footed ferret. Direct impacts could include mortality due to exposure to vehicles and human disturbance during ground surveillance that happens annually, but are unlikely due to the nocturnal activity of the black-footed ferret. Indirect impacts during aerial and ground surveillance could result from increased noise, and human presence could cause short-term displacement, but are unlikely due to the nocturnal activity of the black-footed ferret and short duration of the aerial reconnaissance, once every 2 weeks.

According to the Keystone's Pipeline Temperature Effects Study (Appendix F), the pipeline does have some effect on surrounding soil temperatures, primarily at pipeline depth, in an area 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 impacted mainly by climate (such as air temperature and plant water availability) with negligible effect 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 impacts to vegetation.

Adverse effects to black-footed ferrets resulting from a crude oil spill from the pipeline are highly improbable due to the low probability of a spill, the low probability of a spill coinciding with the presence of black-footed ferrets, and the low probability of a ferret contacting the spilled product (see Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis).

Power Lines and Substations

Power line routes associated with the proposed Project are likely to attract raptors, known to be predators of the black-footed ferret and their primary prey, prairie dogs. The proposed transmission line route locations in Montana would be analyzed for any active prairie dog towns. Protection measures could then be implemented by electrical service providers to minimize raptor perching in accordance with the Avian Power Line Interaction Committee (APLIC), Suggested Practices for Avian Protection on Power Lines (APLIC 1996).

Electrical power line providers are responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments to construct new power lines necessary to operate the proposed Project. Keystone would inform electrical power providers of the requirements for consulting on threatened and endangered species issues with the USFWS for the electrical infrastructure components constructed for the proposed Project to prevent impacts to black-footed ferrets.

3.1.1.4 Cumulative Impacts

Incremental loss or alteration of black-tailed prairie dog colonies through prior project construction and operation in addition to similar effects from the proposed Project could lead to cumulative impacts on the black-footed ferret in Montana and South Dakota. However, the black-tailed prairie dog colonies that would be crossed by the proposed Project were determined to be too small to support black-footed ferrets.

3.1.1.5 Conservation Measures

In Nebraska and South Dakota, black-footed ferret surveys are no longer recommended in prairie dog towns. To prevent potential direct or indirect impacts to the black-footed ferret from construction in Montana, Keystone has committed to:

- 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). At this time, the Department has determined, based on feedback from the USFWS, that no black-footed ferret surveys would be required.
- Complete surveys to identify prairie dog colonies in Fallon County, Montana consistent with the Final EIS to determine if any Category 3 colonies or complexes occur and could be avoided.
- 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.

3.1.1.6 Determination

Effect on Critical Habitat

No critical habitat has been identified for this species. Therefore, the proposed Project would not result in the destruction or adverse modification to federally designated critical habitat for the black-footed ferret.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" wild or reintroduced non-experimental populations of the endangered black-footed ferret. This determination is based on agency provided information, the lack of potential for occurrence of wild populations of black-footed ferrets within the proposed Project area, and Keystone's commitment to follow recommended conservation measures. No prairie dog towns would be crossed or impacted by the proposed Project.

3.1.2 Interior Least Tern - Endangered

3.1.2.1 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 (50 FR 21784-21792). 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 coast of Caribbean Islands, the eastern coast of Central America, and northern South America. The interior least tern continues to breed in most of the historic 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 four to five 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 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 predominately 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, is a threat 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).

3.1.2.2 Potential Presence in Project Area

Montana

According to the USFWS Billings Ecological Services Field Office (AECOM 2008b) and the MFWP (AECOM 2009d), the Yellowstone River crossing in Dawson County, Montana has historically supported, and currently supports, breeding populations of interior least terns.

South Dakota

During a meeting with Keystone representatives on June 10, 2008, SDGFP indicated that the Cheyenne River crossing on the border of Meade, Pennington, and Haakon counties has historically supported, or currently supports, breeding populations of interior least terns (AECOM 2008d).

Nebraska

The distribution of interior least terns along the proposed Project route in Nebraska includes the Platte, Loup, and Niobrara rivers (AECOM 2008c). The Project would cross the Platte River at the border between Merrick and Hamilton counties; sandbars and sand/gravel pits associated with this segment of the river are known to still support least tern breeding populations. The Loup River in Nance County and the Niobrara River on the border of Keya Paha and Rock counties contain sandbars and also continue to support breeding interior least terns. 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.

In 2008, 2011, and 2012, surveys for suitable habitat and occurrences of interior least tern nests were conducted at the crossings of the Missouri and Yellowstone rivers in Montana, the Cheyenne River in South Dakota, and the Platte, Loup, and Niobrara rivers in Nebraska (Table 3.1-1, below) (Appendix H consists of the Summary Report of the July 2008 Piping Plover (*Charadrius melodus*) and Least Tern (*Sterna antilarum*) Surveys for the Steele City Segment of the Keystone XL Project, Appendix I consists of the Summary of 2011 Federally-Listed Species Searches for the Keystone XL Pipeline Project Steele City Segment (including the Western Prairie Fringed Orchid, Interior Least Tern, and Piping Plover, and Appendix J consists of the Summary of 2012 Special Status Species Searches for the Keystone XL Pipeline Project Nebraska Reroute (including the Western Prairie Fringed Orchid, Interior Least Tern, and Piping Plover). In the winter of 2011, the Missouri, Yellowstone, and Cheyenne rivers flooded, and suitable interior least-tern habitat may have also flooded and thus may not have been present that year.

Table 3.1-1 Occurrence Surveys for the Interior Least Tern within 0.25 Mile of the Proposed Project Route in 2008, 2011, and 2012

State	County	Survey Location	Survey Date	Survey Results	Comments
Montana	Valley / McCone	Missouri River	June 3 and July 11, 2011	No interior least terns observed at river crossings.	Poor bank and no island nesting habitat, suitable foraging habitat.
Montana	Dawson	Yellowstone River	June 3 and July 11, 2011	No interior least terns observed at river crossings.	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	No interior least terns observed at river crossings.	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	Four interior least terns observed in 2012.	Good bank and island nesting habitat, suitable foraging habitat at crossing location.
Nebraska	Nance	Loup River	July 21, 2008, July 6 & 7, 2011, June 14 – 18, 2012	Two interior least terns observed in 2012, no nesting.	Suitable nesting and foraging habitat at crossing location.
Nebraska	Merrick / Hamilton	Platte River	July 22, 2008, July 6 & 7, 2011, July 15 – 20, 2012	No interior least terns observed at river crossings.	Good nesting and foraging habitat at crossing location, however very little water present in 2012 due to drought

3.1.2.3 Impact Evaluation

The proposed Project could affect the interior least tern through disturbance of individuals or modification to nesting and foraging habitats. Surface water depletions to the Platte River system can also adversely affect the interior least tern. Disturbances in proximity to active nests can cause nesting activity disruption and loss of nests.

Construction

The primary construction-related impacts would be disturbance and potential exposure to small fuel spills and leaks from construction machinery. The chance 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 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 following construction measures would be implemented to minimize impacts to interior least terns:

- 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. These buffers would 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 would be completed by trained personnel and would use secondary containment. If interior least tern nests are found at these crossings, then Keystone would 1) adhere to the 0.25 mile buffer of no construction activity and 2) continue to monitor nests if any are within 0.25 mile of the construction footprint until the young have fledged.
- Keystone has committed to conducting surveys before construction begins if construction activities occur during the nesting season.

The interior least tern is known to nest within or near the proposed Project at the Platte, Loup, and Niobrara rivers in Nebraska, the Cheyenne River in South Dakota, and the Yellowstone River in Montana. No direct impacts to interior least tern nesting habitat would be anticipated at these locations, since pipeline placement across the rivers would be completed by the HDD method. Minimal hand clearing of vegetation and limited human access would be required within the riparian areas of these rivers in order to use the Tru-Tracker® cable (clearing would be limited to a 3-foot maximum hand cleared path) 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. Drilling equipment pads and staging areas for HDD will have required set-backs from the riparian zone in each river and will 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.

Indirect impacts 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 (USFWS 2012b). Prior to construction-related activities that would occur within 0.25 mile from nesting interior least terns, Keystone proposes to conduct presence/absence surveys just prior to beginning construction-related activities to identify active nest sites, in coordination with the USFWS. If active nest sites are identified, the USFWS would 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. Should night-time HDD work occur, lights would be downshielded. If least terns are documented within the construction corridor, the following potential measures would ensure minimal effects to either nesting adults or fledglings:

- Avoid construction activities within 0.25 mile from nesting terns.
- Temporarily delay construction activities until young have fledged the nest.
- Make minor adjustments to pipeline corridor, if possible.

Impacts to the interior least tern from temporary water reductions during hydrostatic testing in the lower Platte River Basin would be avoided based on Keystone's plan to withdrawn the volume needed at a rate less than 10 percent of the baseline daily flow and to return water back to its source within a 30-day period. The one-time water use for hydrostatic testing, low volume of water used for testing (compared to daily flows in the river basin), and the return of the water to the river source would not impact least tern nesting habitat.

Operations

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

The major rivers that contain interior least tern habitat would be crossed using the HDD method which would result in a burial depth of 25 feet or greater from the river bottom. It is highly unlikely that a leak in the pipeline would occur coincident with these locations, and when interior least terns were present. In the event of a leak, the crude oil would need to penetrate greater than 20 feet of overburden before reaching the river, thereby reducing the risk in some cases 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. Further, if a significant spill event were to occur, federal and state laws would require clean up.

Direct contact with a crude oil spill could result in adverse effects to interior least terns due to oiling of plumage, crude oil ingestion from contaminated plumage and prey, and crude oil transfer to eggs and young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to interior least terns are unlikely due to the low probability of a spill and the low probability of the spill coinciding with the presence of least tern individuals. (See Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis, for further information regarding impacts to wildlife from a potential spill event.)

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. Indirect impacts during aerial and ground surveillance are unlikely to disturb nesting interior least terns.

According to Keystone's Pipeline Temperature Effects Study (Appendix F), 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 is buried greater than 25 feet below the river bottom using the HDD method, temperature dissipation effects would be negligible.

Power Lines and Substations

The construction of a new electrical power line segment across the Yellowstone River in Montana and the Platte River in Nebraska would incrementally increase the collision and predation potential for foraging and nesting interior least terns in the proposed Project area. Construction of these power line segments during the nesting season would also potentially disturb nesting and brood-rearing birds. Based on habitat and occurrence surveys for this species at the Platte River crossing, nesting habitat quality within line of sight of the proposed Project centerline was considered to be of good quality. Additionally, correspondence with MFWP (AECOM 2008b) and results of biological surveys to delineate wetlands and waterbodies identified good quality breeding habitat at the Yellowstone River crossing.

Protection measures could be implemented by electrical service providers to minimize or prevent construction disturbance, collision risk, and predation risk to foraging interior least terns at the Platte River and Yellowstone River crossings with the use of standard measures as outlined in *Mitigating Bird Collision with Power Lines* (APLIC 1994). Electrical power line providers are responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments to construct new power lines necessary to operate the proposed Project. To prevent impacts to foraging least terns, electrical power providers, except those along the proposed Nebraska reroute, made commitments to consult with the USFWS on threatened and endangered species issues for the electrical infrastructure components constructed for the proposed Project. These commitments are included in Appendix A (Letters of Section 7 Consultation Commitments from Power Providers). After the pipeline route is selected in Nebraska, the power providers will complete their analyses and consult with the USFWS on their power line routes. Conservation measures applicable to power lines are presented below.

3.1.2.4 Cumulative Impacts

The proposed Project could potentially affect four federally protected or candidate migratory birds (the whooping crane, piping plover, interior least tern, and Sprague's pipit) within their migration range from Nebraska to Montana and/or within their nesting habitats. Conservation measures proposed for three of these birds (i.e., whooping crane, piping plover, and interior least tern) include protection of river and riparian nesting and migration staging habitats through use of HDD crossing methods and site-specific surveys to avoid disturbance to migration staging, nesting, and brood-rearing individuals. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize effects to these birds.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for the four federally protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds, including the greater sage-grouse (although not a migratory bird), interior least tern, piping plover, and Sprague's pipit.

Impacts to federally protected and candidate species from the construction and operation of the connected actions (Bakken Marketlink Project, Big Bend to Witten 230-kV Transmission Line, and Electrical Distribution Lines and Substations) would be long term or permanent. The greater sage-grouse, Sprague's pipit, and federally protected species may be impacted by habitat loss resulting from construction of the Bakken Marketlink Project, along with future projects in the area that reduce and fragment preferred habitat for these species. Construction of the proposed Big Bend to Witten 230-kV Transmission Line in southern South Dakota during the breeding season could potentially disturb nesting and brood-rearing interior least terns. Operation of the line would increase the collision and predation hazards for feeding and nesting interior least terns in the Project area. However, habitat loss would be mitigated and any additional potential habitat loss would likely require similar conservation methods and mitigations, thus reducing overall cumulative impacts on these species.

The transmission line, electrical distribution lines, and substations could result in long-term increased bird collisions, bird predation, and habitat loss. However, with implementation of conservation measures, it is not expected that these lines would have cumulative impacts on the interior least tern.

3.1.2.5 Conservation Measures

The following conservation measures, based on agency consultation, would apply if construction-related activities, including HDD and hydrostatic testing, were to occur during the interior least tern nesting season:

- Pre-construction surveys would 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 River in Montana during the nesting season (April 15 to September 1 inclusive) to ensure that there are no nesting pairs 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.

- Construction would not be permitted within 0.25 mile from an occupied nest site during the nesting season or until the fledglings have left the nesting area.
- Downshielding 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 sites.

Conservation measures to avoid or minimize adverse impacts to breeding and foraging interior least terns from new power lines will vary depending on the circumstances, but may include the following measures:

- Marking of new power lines with bird flight diverters (preferably Swan Spiral diverters or Firefly diverters) within 0.25 mile of interior least tern nesting sites on river systems or commercial sandpit areas.
- If construction of power lines occurs during the interior least tern nesting season, 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 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.
- Distribution lines supplying power to Pump Station 23 and Pump Station 24 should be marked with bird deflectors where 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.

3.1.2.6 Determination

Effect on Critical Habitat

No critical habitat has been designated for this species. Therefore, the proposed Project would not result in the destruction or adverse modification to federally designated critical habitat for the interior least tern.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" interior least terns. This determination is based on Keystone's plan to HDD the Platte, Loup, Niobrara, Cheyenne, and Yellowstone rivers and Keystone's commitment to follow recommended conservation measures identified by the USFWS.

Although it is possible that a spill event could result in an adverse effect on this species, the probability of adverse effects to 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. 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 same cases of crude oil reaching the river and the potential for exposure. As a result, no direct or indirect impacts would likely result from the proposed Project operation.

3.1.3 Whooping Crane - Endangered

3.1.3.1 Natural History and Habitat Association

The whooping crane (*Grus americana*) was listed as endangered on March 11, 1967 (32 FR 4001). Whooping cranes are migrating birds that occur only in North America. In 2006, the total wild population was estimated to be 338 birds (Canadian Wildlife Service [CWS] and USFWS 2007). This estimate includes 1) 215 birds in the self-sustaining Aransas-Wood Buffalo National Park Population (AWBP) that winters in coastal marshes in Texas and migrates to Canada to nest in Wood Buffalo National Park and adjacent areas, as well as 2) 123 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 (CWS and USFWS 2007). 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).

During spring and fall migration, 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 late March through May 1. Fall migration typically begins in mid-September with most birds arriving on wintering grounds between late October and mid-November (CWS and USFWS 2005).

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 2005). Whooping cranes generally use seasonally or semi-permanently flooded palustrine wetlands, broad river channels, and shallow portions of reservoirs for roosting and various cropland and emergent wetlands for feeding (Austin and Richert 2001, Johns et al. 1997). Whooping cranes have also roosted at stock ponds. They generally feed on small grains (including a number of cultivated crops), aquatic plants, insects, crustaceans, and small vertebrates (Oklahoma State University 1993). Cranes roost on submerged sandbars in wide unobstructed channels that are isolated from human disturbance (Armbruster 1990).

Critical habitat for whooping cranes has been designated in Nebraska and includes a segment of the 3-mile-wide, 56-mile-long reach of the Platte River from Lexington to Denman, Nebraska (43 FR 20938-942, CWS and USFWS 2005). This critical habitat is several miles west of the proposed Project ROW; no critical habitat would be crossed by the Project.

3.1.3.2 Potential Presence in Project Area

The whooping crane occurs as a migrant throughout the proposed Project area (USFWS 2012b). 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 15 through May 31 in Nebraska, South Dakota, and Montana and fall migration extends from September 1 through November 31. Whooping cranes pass though the eastern edge of Montana and through South Dakota where they use suitable roosting and foraging habitats in riverine and wetland systems.

Montana

During a meeting with Keystone representatives on February 3, 2009, the MFWP identified the Yellowstone River as a potential stop-over site for whooping cranes (AECOM 2009f).

South Dakota

The Missouri River system is used by whooping cranes in South Dakota, but they also can use any wetland during severe weather episodes and wetlands close to agricultural lands where they can feed. Correspondence with SDGFP indicates the White and Cheyenne rivers contain suitable stop-over habitat although it is very unlikely that whooping cranes would be present at these crossings (AECOM 2008e).

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 2008e). The Platte, Loup, and Niobrara rivers would be crossed by the proposed Project. As mentioned above, the USFWS has designated critical habitat for the whooping crane along a stretch of the Platte River several miles west of the proposed Project area (CWS and USFWS 2005).

Ill-timed human activities in the vicinity of important roosting and feeding habitats can disturb whooping cranes. A whooping crane survey protocol was developed by USFWS to assist Keystone with conducting surveys for this species. Power lines providing electricity to power pumping stations could pose a collision risk to whooping cranes if located near wet meadows, wetlands, stock ponds and other waterbodies (USFWS 2012b). The majority of the proposed Project route in the southern half of South Dakota and all of Nebraska is within the 95 percent (170 mile-wide) central flyway whooping crane migration corridor for the Aransas-Wood Buffalo whooping crane population (CWS and USFWS 2005) (i.e., 95 percent of the Aransas-Wood Buffalo population flies within this flyway migration corridor, which crosses north-south through the central Great Plains) (Figure 3.1.3-1). The proposed Project in Montana and the northern half of the Project route in South Dakota is west of the 95 percent flyway migration corridor. A 60-acre pipe yard for the proposed Project in North Dakota is also west of the flyway migration corridor. Individual birds can be found outside the 95 percent flyway migration corridor, and could possibly occur within the proposed Project area in Montana 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 other lacustrine wetlands.

3.1.3.3 Impact Evaluation

Construction

The primary construction-related impacts would be disturbance and potential exposure to small fuel spills and leaks from construction machinery. The chance for construction-related spills within whooping crane roosting and foraging habitat is 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 CMRP Section 3, Spill Prevention and Containment (Appendix B). 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."

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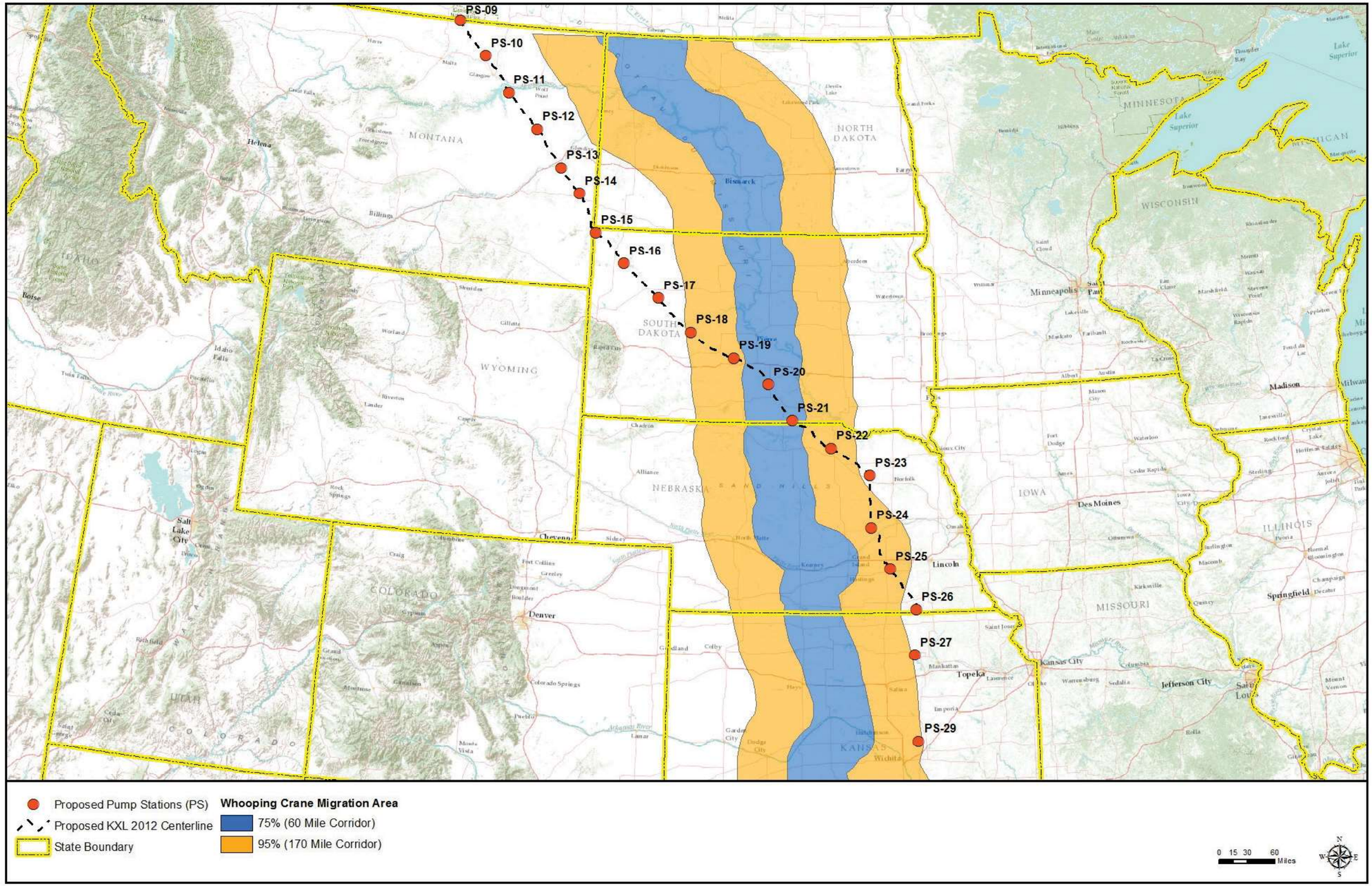

Figure 3.1.3-1 Central Flyway Whooping Crane Migration Corridor for the Aransas-Wood Buffalo Population

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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. The potential magnitude of spill effects varies with multiple factors, the most significant of which includes the amount of material released, the size of the spill dispersal area, the type of spill, the species assemblage present, climate, and the spill response tactics employed. Keystone has a detailed spill response plan prepared (Appendix D, SPCC Plan and ERP). Spill clean-up equipment and supplies will be secured before construction is initiated. All equipment refueling will be conducted at least 100 feet from a waterbody. Keystone would ensure that contractor's refueling staff are fully trained and understand the importance of adhering to restrictions to refueling operations near all waterbodies.

No direct impacts to the whooping crane are anticipated from the construction of the proposed Project. Suitable roosting and/or foraging habitats occur within the proposed Project area at major river crossings including the Yellowstone, Cheyenne, White, Niobrara, Loup, and Platte rivers. Habitats at these rivers would be crossed by HDD, so potential habitat loss, alteration, or fragmentation would be negligible. Minimal hand clearing of vegetation and limited human access would be required within the riparian areas of these rivers in order to use the HDD electronic guidance system (Tru-Tracker® cable) that is associated with the drilling equipment and in order to access these rivers to potentially withdraw water for the proposed Project's HDD and hydrostatic tests.

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 within or near the proposed Project 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).

Indirect impacts 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. An estimated 36.54 miles of the 878-mile pipeline route lies within the whooping crane central flyway migration corridor, which is based on whooping crane sightings (See Figure 3.1.3-1, USFWS 2010). Of the pipeline route within this flyway migration corridor, an estimated 102.11 miles occurs within the center of the corridor where the majority (75 percent) of sightings have been documented (USFWS 2010). Any potential construction-related disturbance during the migration period would most likely occur within this 102.11 mile segment through Jones, Lyman, and Tripp counties in South Dakota, and Keya Paha County in Nebraska.

Water use is unlikely to affect the amount of roosting or foraging habitat along the rivers used by whooping cranes because Keystone proposes to use a small volume of water in comparison to the daily flow rate of the stream, and would return that water, with no additives or chemicals added, to the same source after hydrostatic testing if taken from the Platte River Basin. Indirect impacts to the whooping crane from temporary water reductions during hydrostatic testing in the lower Platte River Basin would be considered negligible, based on Keystone's plan to return water back to its source within a 30-day period and the volume needed would be withdrawn at a rate less than 10 percent of the baseline daily flow.

Operations

Normal pipeline operation would not be expected to affect the whooping crane or habitats used during migration. 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. 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, and would be unlikely to disturb roosting or foraging cranes. 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 disturb migrant cranes.

Roosting habitats at rivers crossed by the HDD method would typically have 20 feet or more of overburden between the pipeline and river bottom. Therefore, heat dissipated from the pipeline would not affect riverine roosting habitats.

Direct contact with a crude oil spill could result in adverse effects to whooping cranes due to plumage oiling and crude oil ingestion from contaminated plumage and prey. While these exposure risks have the potential to cause adverse effects to individuals, the probability of adverse effects to whooping cranes are unlikely due to the low probability of a spill, low probability of the spill coinciding with the presence of migrating whooping cranes or migration habitats, and low probability of a whooping crane contacting the spilled product (see Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis).

Based upon a 102.11 mile pipeline segment that passes through the whooping crane flyway migration corridor and an incident spill risk of 0.00025 incident/ mile-year as described in Section 4.14 of the draft Supplemental Environmental Impact Statement, the estimated spill risk occurrence within the flyway migration corridor is 39 years or 0.026 incidences per year. Spill volume cannot be predicted; however, because 80% of historical spill volumes are less than 50 barrels (bbls), the probable spill volume could be less than 50 bbls which could result in a radial impact from the pipeline of up to 112 feet (34.1 meters) (U.S. Department of State 2012).

In the unlikely event of a pipeline leak, the crude oil would need to penetrate this significant amount of overburden before reaching the river, thereby reducing the risk of crude oil reaching the river and thereby reducing the potential for whooping crane exposure. Additionally, the major river crossings are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR Part 195). Further, if a significant spill event were to occur, federal and state laws would require clean up.

Power Lines and Substations

Power lines associated with the proposed Project are collision hazards to migrant whooping cranes. Recent studies conducted by the USFWS in conjunction with University of Nebraska researchers have documented migratory bird mortalities, including cranes, from collisions with two existing 69-kV transmissions lines that cross the Platte River (Murphy et al. 2009; USFWS 2009a; Wright et al. 2009). One study conducted during the spring whooping crane 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. Bird diverter devices (such as FireFly™ bird diverters) may reduce crane collisions

and mortality from power lines by alerting cranes to the presence of power lines in their flight path (Murphy et al. 2009).

The construction of new electrical power line segments, especially those across riverine roosting habitats (e.g., Platte River in Nebraska), wetland roosting habitats, or between roosting habitat and nearby foraging habitat including wetlands and grain fields would incrementally increase the collision hazard for migrating whooping cranes because a portion of the proposed Project area is located within the flyway migration corridor for this species. A total of 0.75 mile of emergent wetlands and 0.08 mile of riverine/open water habitats would be crossed by distribution lines to pump stations within states where power distribution lines for pump stations are within the flyway migration corridor (Table 3.1-2).

Table 3.1-2 Wetlands Crossed by Transmission Lines within the Central Flyway Whooping Crane Migration Corridor[a]

State	Vegetation Community Classification	Length of Wetlands Crossed[b] (miles)	Wetland Area Affected during Construction (acres)	Wetland Area Affected during Operation (acres)
Montana	No wetlands within flyway	--	--	--
South Dakota	Palustrine Emergent Wetlands	0.75	16.16	8.65
	Palustrine Forested Wetlands	0.08	0.83	0.51
Nebraska	TBD[c,d]	TBD[c,d]	TBD[c,d]	TBD[c,d]

[a] Wetlands identified is based on transmission lines crossing within the whooping crane central flyway migration corridor.

[b] Length of the wetlands crossed was calculated by how much of the transmission line crossing was within the whooping crane migration corridor.

[c] Nebraska route at this point in time does not have transmission lines identified.

[d] Transmission line locations and potential impacts will be addressed after approval of the route by NDEQ and Department.

Additional facilities such as power lines required for the pump stations, remotely operated valves, and densitometers would require permits from appropriate agencies and would be installed and operated by local power providers and not by Keystone. A summary of impacts associated with the power line installations is contained in the September 7, 2012 TransCanada Keystone XL Pipeline Project Environmental Report, Section 6, Electrical Power Lines (exp Energy Services Inc. 2012).

Preliminary information on the design, construction, and operation of electrical transmission lines is presented below. Although the permit applications for these projects would be reviewed and acted on by other agencies, the potential impacts of these projects have been analyzed in the Supplemental EIS based on currently available information and are addressed within each resource assessed in the Supplemental EIS Chapter 4, Environmental Consequences. However, in some cases only limited information was available on the design, construction, and operation of the projects. The reviews of permit applications by other agencies would include more detailed environmental reviews of the connected actions.

An analysis of suitable migration stop-over habitat (e.g., large waterbodies, wetlands, and associated agricultural fields) in relation to the preliminary routes for associated transmission

lines identified multiple locations within the flyway migration corridor where new transmission lines for 8 pump stations fall within the 75 percent or 95 percent whooping crane migration corridors (USFWS 2010) including:

- PS-18 Haakon County, SD (95 percent)
- PS-19 Haakon County, SD (95 percent)
- PS-20 Tripp County, SD (75 percent)
- PS-21 Gregory/Tripp, SD (75 percent)
- PS-22 Holt, NE (95 percent)
- PS-24 Nance, NE (95 percent)
- PS-25 Fillmore, NE (95 percent)
- PS-29 Butler, KS (95 percent)

Protection measures that could be implemented by electrical service providers first include avoidance and then minimization measures to prevent collision risk to migrating whooping cranes. Standard measures are outlined in *Mitigating Bird Collision with Power Lines* (APLIC 1994). Electrical power line providers are responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments to construct new power lines necessary to operate the proposed Project. Keystone would advise electrical power providers of their ESA consultation requirements with the USFWS for the electrical infrastructure components constructed for the proposed Project to prevent impacts to whooping cranes.

Cumulative Impacts

The proposed Project could potentially affect four migratory birds within their migration range from Nebraska to Montana and/or within their breeding habitats. Conservation measures proposed for three of these birds (i.e., whooping crane, piping plover, and interior least tern) include protection of river and riparian nesting and migration staging habitats through use of HDD crossing methods and site-specific surveys to avoid disturbance to migration staging, nesting, and brood-rearing individuals. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize effects to these birds.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for four federally protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds, including the greater sage-grouse (although not a migratory bird), interior least tern, piping plover, and Sprague's pipit.

The whooping crane may experience long-term impacts associated with riparian areas that may be used for roosting and feeding. The use of the HDD method at major river crossings would reduce the probability of roosting and feeding habitat loss or alteration. In other areas along the corridor, revegetation (particularly within riparian zones and in wetland habitats) would reduce habitat impacts. The regeneration of revegetated areas may be slow which may cause long-term roosting

and feeding habitat loss. Future projects in the area that reduce and fragment preferred roosting and feeding habitat for the whooping crane may provide the potential for additive cumulative effects to this species. Incremental impacts to streams and riparian habitats from future linear project construction and the accidental spread of exotic aquatic invasive plants and animals could increase cumulative impacts to threatened and endangered species habitat.

The central flyway whooping crane migration corridor overlaps with the proposed Project in South Dakota, Nebraska, and Kansas (Figures 2.2.3-1 and 2.2.3-2). Cumulative impacts to the whooping crane associated with the concurrent construction of the TransCanada Gulf Coast pipeline project are also considered. That project overlaps with the flyway migration corridor of the whooping crane in northern Oklahoma only; if construction periods between the TransCanada Gulf Coast pipeline project overlap with the proposed Project, they would likely do so for a short period of time only. Based on geographic proximity and the implementation of mitigation and restoration measures to address riparian habitat impacts, cumulative impacts to the whooping crane are not anticipated.

Impacts to federally protected and candidate species from the construction and operation of the connected actions (Bakken Marketlink Project, Big Bend to Witten 230-kV Transmission Line, and Electrical Distribution Lines and Substations) would be long term or permanent. The greater sage-grouse, Sprague's pipit, and federally protected species may be impacted by habitat loss resulting from construction of the Bakken Marketlink Project, along with future projects in the area that reduce and fragment preferred habitat for these species. However, habitat loss would be mitigated and any additional potential habitat loss would likely require similar conservation methods and mitigations, thus reducing overall cumulative impacts on these species. The Bakken Marketlink facilities near Baker, Montana would not likely affect the whooping crane, as this region is not within the flyway migration corridor. Operation of the proposed Big Bend to Witten 230-kV transmission line in southern South Dakota may increase the collision hazards for migrating whooping cranes, which could adversely affect populations of this species.

3.1.3.4 Conservation Measures

The following conservation measures, based on consultation with the USFWS, would apply if pipeline construction-related activities were to occur in close proximity to migrating whooping cranes:

- During spring and fall whooping crane migration periods, environmental monitors would complete a 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 2012b). If whooping cranes are sighted the environmental monitor would 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. Work could proceed if whooping crane(s) leave the area. The compliance manager 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 would be down-shielded should HDD occur at night during the spring and fall whooping crane migrations in areas that provide suitable habitat.

The following conservation measures would apply to power distribution lines to pump stations within the whooping crane migration route:

- Avoid overhead power line construction within 5.0 miles of suitable whooping crane roosting habitat and/or documented high use areas (locations may be obtained from local USFWS, Ecological Services Field Office).
- To the extent practicable, bury all new power lines, especially those within 1.0 mile of potentially suitable migration stopover habitat.

If it is not economically or technically feasible to bury the line, conservation measures to minimize or avoid impacts to migrating whooping cranes would vary depending on the circumstances, but may include the following:

- Within the 95-percent migration corridor: mark new lines within 1 mile of potentially suitable habitat and an equal amount of existing line within 1 mile of potentially suitable habitat within the identified migration corridors (at a minimum within the 75-percent corridor, preferably within the 95-percent corridor, Figure 3.1.3-1).
- Within the 95 percent migration corridor, install bird flight diverters to minimize the risk of collision.
- 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.
- 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.

3.1.3.5 Determination

Effect on Critical Habitat

The proposed Project would not result in the destruction or adverse modification of federally designated critical habitat for the whooping crane. The area of designated critical habitat for the whooping crane in Nebraska is upstream from the Platte River crossing, and other critical habitat areas are well outside the proposed Project area.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" whooping cranes. This determination is based on the rarity of the species, its status as a migrant through the proposed Project area, Keystone's commitment to follow recommended conservation measures identified by the USFWS, and power providers will consult with the USFWS regarding ways to minimize or mitigate impacts to the whooping crane and other threatened and endangered species for new distribution lines to the pump stations (See Appendix A, Letters of Section 7 Consultation Commitments from Power Providers) and follow recommended avoidance and conservation measures of the USFWS. As a result, no direct impacts are expected to result from construction. Indirect impacts from disturbance of migrating whooping cranes during Project construction and

hydrostatic testing are expected to be avoided and minimized through Keystone's commitment to follow recommended conservation measures identified by the USFWS.

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 whooping cranes are unlikely due to the low probability of a spill, low probability of the spill coinciding with the presence of whooping cranes or migration habitats, and low probability of a whooping crane contacting the spilled product.

3.1.4 Pallid Sturgeon - Endangered

3.1.4.1 Natural History and Habitat Association

The pallid sturgeon (*Scaphirhynchus albus*) was listed as endangered on September 6, 1990 (55 FR 36641). 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 water, turbid habitat with a diverse mix of physical habitats that were in a constant 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 2012b). Prior to dam development along the Missouri and Mississippi rivers, these features were in a constant 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 this species (Wilson 2004). The historic 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 Missouri River between the Marias River and Fort Peck Reservoir in Montana; between Fort Peck Dam and Lake Sakakawea (near Williston, North Dakota); within the lower 113 km (70 miles) of the Yellowstone River to downstream of Fallon, Montana; in the headwaters of Lake Sharpe in South Dakota; and from the Missouri River near the mouth of the Platte River near Plattsmouth, Nebraska. Although widely distributed, pallid sturgeon remain 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).

Critical habitat has not been designated for the pallid sturgeon, but sections of rivers relatively unchanged by dam construction and operation that maintain large, turbid, free-flowing river characteristics are important in maintaining residual populations of this species. However, several

areas have been designated as Recovery Priority Management Areas (RPMAs) in the species recovery plan (USFWS 1993, 2005) (Figure 3.1.4-1). The proposed Project crosses the Missouri, Yellowstone, and Milk rivers, which are located in pallid sturgeon RPMAs 1 and 2. RPMA 1 is from the Missouri River from the headwaters of Fort Peck Reservoir upstream to the confluence of the Marias River, Montana. RPMA 2 is from the Missouri River from Fort Peck Dam to the head waters of Lake Sakakawea, including the Yellowstone River upstream to the mouth of the Tongue River (USFWS 1993). The Milk, Missouri, and Yellowstone rivers would be crossed using the HDD method.

3.1.4.2 Potential Presence in Project Area

The potential for this species to occur within the proposed Project area exists at the crossing of the Milk River above the Fort Peck Reservoir, at the crossing of the Missouri River below Fort Peck Dam, and the crossing of the Yellowstone River downstream of Fallon, Montana. The Milk River proposed Project crossings is located in RPMA 1 for the pallid sturgeon and the Missouri and Yellowstone river crossings are located in RPMA 2. This species also occurs in the lower Niobrara River approximately 5 miles upstream from the confluence of the Missouri and Niobrara rivers, and the lower Platte River downstream from the proposed Project crossing generally in the river segment from the confluence of the Loup and Platte rivers to the confluence of the Platte and Missouri rivers.

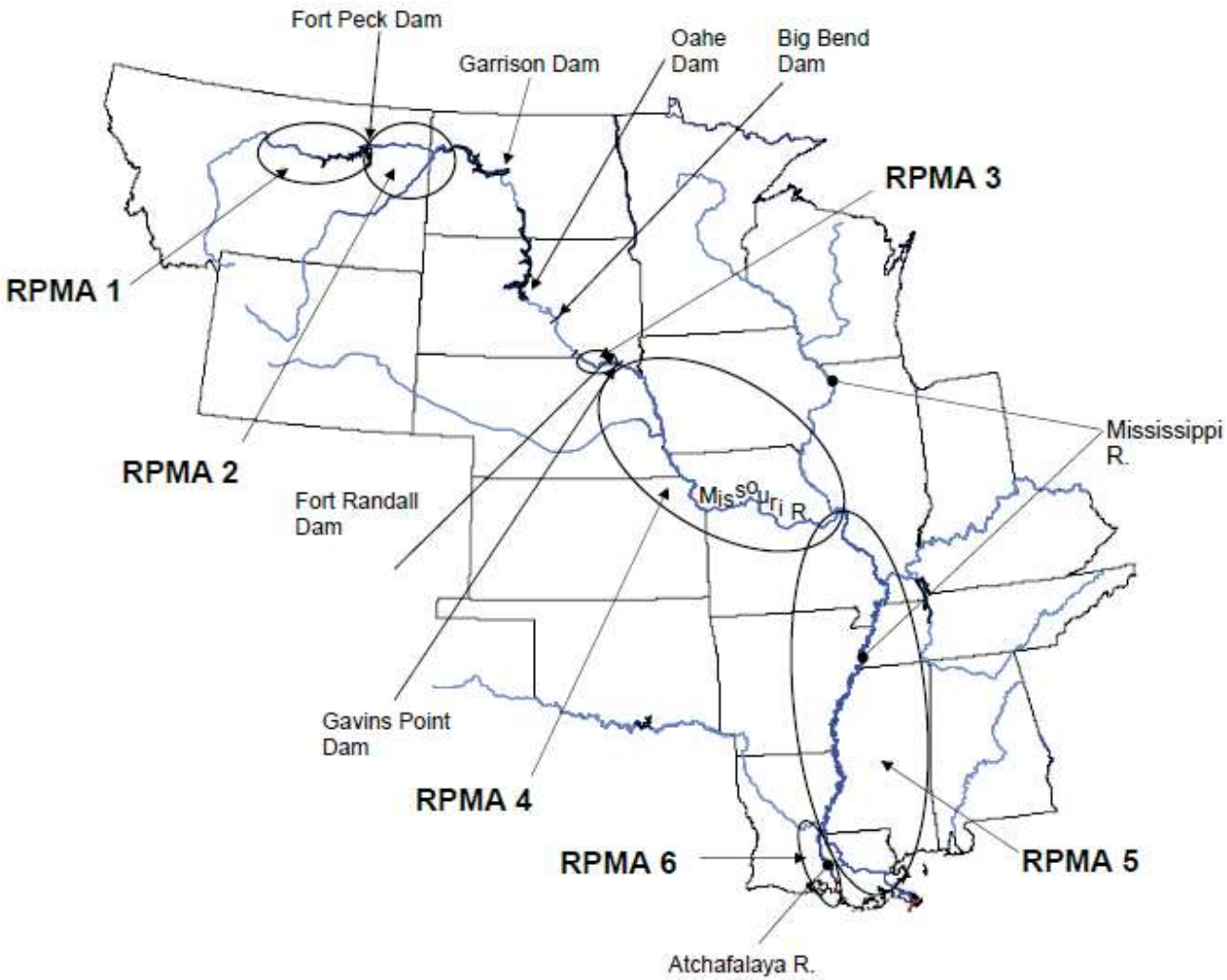
The pallid sturgeon is found in big river systems including the Missouri River and its major tributaries including the Yellowstone, Niobrara, and Platte rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters form the large-river ecosystem that provides macrohabitat requirements for the pallid sturgeon, a species that is associated with diverse aquatic habitats. These habitats historically were dynamic and in a constant state of change due to influences from the natural hydrography, and sediment and runoff inputs from an enormous watershed spanning portions of 10 states.

Navigation, channelization and bank stabilization, and hydropower generation projects have caused the widespread loss of this diverse array of dynamic habitats once provided to pallid sturgeon in the Missouri River system. This has resulted in a precipitous decline in populations of the species. Surface water depletions to the Platte River system can also affect the pallid sturgeon.

3.1.4.3 Impact Evaluation

Construction

Suitable habitat and identified RPMAs within the Milk, Missouri and Yellowstone rivers crossed by the proposed Project in Montana would be crossed using the HDD method. Therefore, no direct impacts to pallid sturgeon habitat are expected to occur as a result of Project construction (USFWS 2008d). Although pallid sturgeon may be present at the crossings of the Milk, Missouri and Yellowstone Rivers, because these river crossings would be crossed using the HDD method, there would be no direct effect on potential river bottom habitat for pallid sturgeon. It would be unlikely that the proposed Project crossings at the Platte and Niobrara rivers would have a negative effect on pallid sturgeon in Nebraska given the lack of suitable habitat, flow, and a river impediment (Spencer Dam) at those crossing sites and that both of these rivers would be crossed using the HDD method.



Source: USFWS 2005.
Note: Map not to scale.
Note: Outlined areas (ovals) correspond with approximate location of Recovery Priority Management Areas (RPMAs) as defined in the Pallid Sturgeon Recovery Plan (USFWS 1993).

Figure 3.1.4-1 Pallid Sturgeon Priority Management Recovery Area

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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 intake end of this pump would be screened using an appropriate mesh size to prevent entrainment or entrapment of larval fish or other aquatic organisms. The withdrawal rates for the pumps would be designed to reduce the potential for entrainment or entrapment of aquatic species. Many of the HDD installations would take place early in the construction period, potentially during the pallid sturgeon spawning period. However, the combination of effective screening and controlled water withdrawal rates would reduce the potential to impact the species.

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. As for the HDD method, the intake end of the pump would be screened with appropriate mesh size to prevent entrainment of larval fish or debris. All water pump intake screens would be periodically checked for entrainment of fish. Should a sturgeon become entrained, all pumping operations would cease immediately and the Compliance Manager for Keystone would immediately contact the USFWS to determine if additional protection measures would be required. 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 to filter the water and not directly into the source (see Appendix B, CMRP, Section 8.4, Dewatering the Pipeline).

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 the mainline, and dust control during 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.

Platte River basin water depletions in Nebraska may affect pallid sturgeon habitats by reducing the amount of water available for this species in the lower Platte River. Impacts to the pallid sturgeon from temporary water reductions during hydrostatic testing in the lower Platte River Basin would be avoided, based on Keystone's plan to withdraw the volume needed at a rate less than 10 percent of the baseline daily flow and to return water back to its source within a 30-day period.

Operations

Routine pipeline operations are not expected to affect the pallid sturgeon. Pump Station 11 is nine miles away from the Missouri River and would have one incandescent light above the station door of the electrical building that is unlikely to have an effect on the river at night.

The Milk, Missouri and Yellowstone rivers in Montana would be crossed by HDD which would result in a burial depth of 25 feet or greater from the bottom of the river. In the highly unlikely event that a leak occurs in the pipeline, 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. Additionally, the Missouri and the Yellowstone rivers also are subject to an intensive integrity management program stipulated by

the USDOT (Integrity Management Rule, 49 CFR 195). Further, if a significant spill event were to occur, federal and state laws would require clean up.

During HDD construction, 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 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.

In the unlikely event of a spill that would enter a river, exposure to crude oil could result in adverse toxicological effects to pallid sturgeon. However, the probability of adverse effects to pallid sturgeon are unlikely due to the low probability of a spill, low probability of a spill in a river reaching where pallid sturgeon are present, and low probability of the spill reaching a river with pallid sturgeon in sufficient amounts to cause toxic effects (See Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis).

3.1.4.4 Cumulative Impacts

Incremental impacts to streams and riparian habitats from future linear project construction and the accidental spread of exotic aquatic invasive plants and animals could increase cumulative impacts to threatened and endangered species habitat. Introduced non-native species can compete with native species and transmit diseases (e.g., whirling disease) that could adversely impact pallid sturgeon. Invasive aquatic 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 channel, or wetlands (Cowie and Robinson 2003, Fuller 2003).

Overall, considerations such as fish life history stage timing, construction impact mitigation, site-specific crossing techniques, seasonal conditions, contingency plans, water quality testing, and water quality compliance would result in the proposed Project having low potential to adversely affect recreationally or commercially important fisheries as a result of construction and normal operation. Existing pipelines, active and abandoned mining sites, Williston basin oil and gas fields, and landfill sites are not noted to have had long-term impacts to fisheries with respect to invasive species. However, mitigation and restoration measures are available to address these concerns within the context of all of these project activities, thus the overall significance to cumulative impacts is low.

3.1.4.5 Conservation Measures

The Project proposes to implement HDD under the Milk, Missouri and Yellowstone rivers. The USFWS recommends that the proposed pipeline crossing be bored beneath channel beds at depths sufficient to prevent scour exposure and potential rupture to avoid impacts to pallid sturgeon and its habitat. As described earlier, the intake end of the pump would be screened to prevent entrainment of larval fish or debris and the intake screens would be periodically checked

for fish entrainment. Should a sturgeon become entrained, 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 used for hydrostatic testing is not chemically treated and would be returned to the source.

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 and Missouri rivers in Montana.

3.1.4.6 Determination

Effect on Critical Habitat

Critical habitat has not been designated for the pallid sturgeon. Therefore, the proposed Project would not result in the destruction or adverse modification of critical habitat for the species. However, the proposed Project would cross the Milk, Missouri and Yellowstone rivers in Montana, identified as RPMAs 1 and 2 for the pallid sturgeon. Implementation of the aforementioned conservation measures and using the HDD method to cross these rivers would avoid negative impacts to these RPMAs.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" the pallid sturgeon. This determination is based on Keystone's plan to use the HDD crossing method for the Milk, Missouri and Yellowstone rivers and Keystone's commitment to follow recommended conservation measures of the USFWS. Some of the recommended mitigation measures to protect pallid sturgeon may include the use of HDD drilling technique including buffers for drill pads, HDD contingency plans, including a frac-out spill plan, use of nontoxic additives during the course of HDD, use of approved screens for temporary surface water withdrawals and minimizing surface water withdrawals from smaller streams for hydrostatic testing during dry or drought conditions.

Although it is possible that a spill event could result in an adverse effect on this species, the probability of such an event would be unlikely due to the low probability of a spill, low probability of a spill in a river reaching where pallid sturgeon are present, and the low probability of the spill reaching a major river with pallid sturgeon 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.

3.1.5 American Burying Beetle - Endangered

3.1.5.1 Natural History and Habitat Association

The American burying beetle (*Nicrophorus americanus*) was federally-listed as e*ndangered o*n July 13, 1989 (54 FR 29652). 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 at the peripheries 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).

The American burying beetle is the largest carrion-feeding insect in North America reaching a length of about 4 cm and a weight of up to 3 grams. 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 2012b).

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 (Creighton et al. 1993, Jurzenski et al. 2011). 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).

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 overwinter until emergence in late May or early June (Hoback, personal communication).

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 from 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.

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 2008f).

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 two 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 effectively eliminating the carcass as a reproductive resource for the beetles. If the carcass is discovered by ants, adult beetles must fend them away 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).

3.1.5.2 Potential Presence in Project Area

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 at that time. Beetles overwinter as adults. Burying beetles likely feed on roadkill found along South Dakota and Nebraska roadways. 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 have been observed to have a thick stand of grassland vegetation with some woody vegetation. Soils composed of some clay with a prominent duff (litter) layer have also been observed at these sites.

The American burying beetle is found in Tripp, Todd, and Gregory counties in South Dakota. In Nebraska, American burying beetle populations are known to occur in Antelope, 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 3.1.5-1).

The proposed Project would result in approximately 500 miles of pipeline construction through South Dakota and Nebraska. Reconnaissance surveys of habitat suitability along the pipeline ROW for South Dakota and Nebraska were conducted from 2008 to 2012 and habitat was rated based on the Nebraska habitat rating system that reflects the potential for American burying beetle occurrence based on general habitat characteristics (Hoback 2010, 2012, Figure 3.1.5-2). 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.

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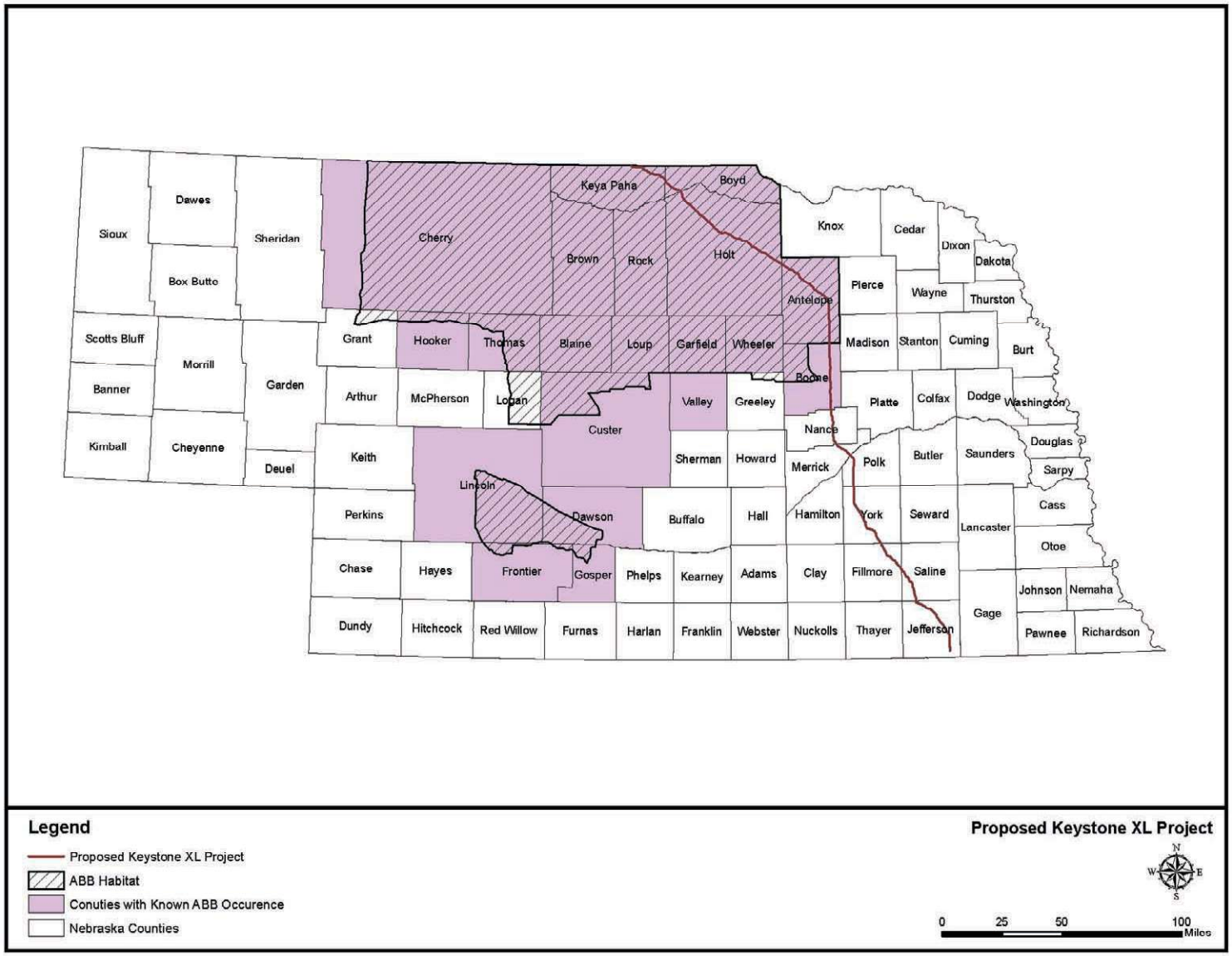

Figure 3.1.5-1 American Burying Beetle habitat and occurrence in Nebraska (USFWS Ecological Field Services Office, Grand Island, Nebraska).

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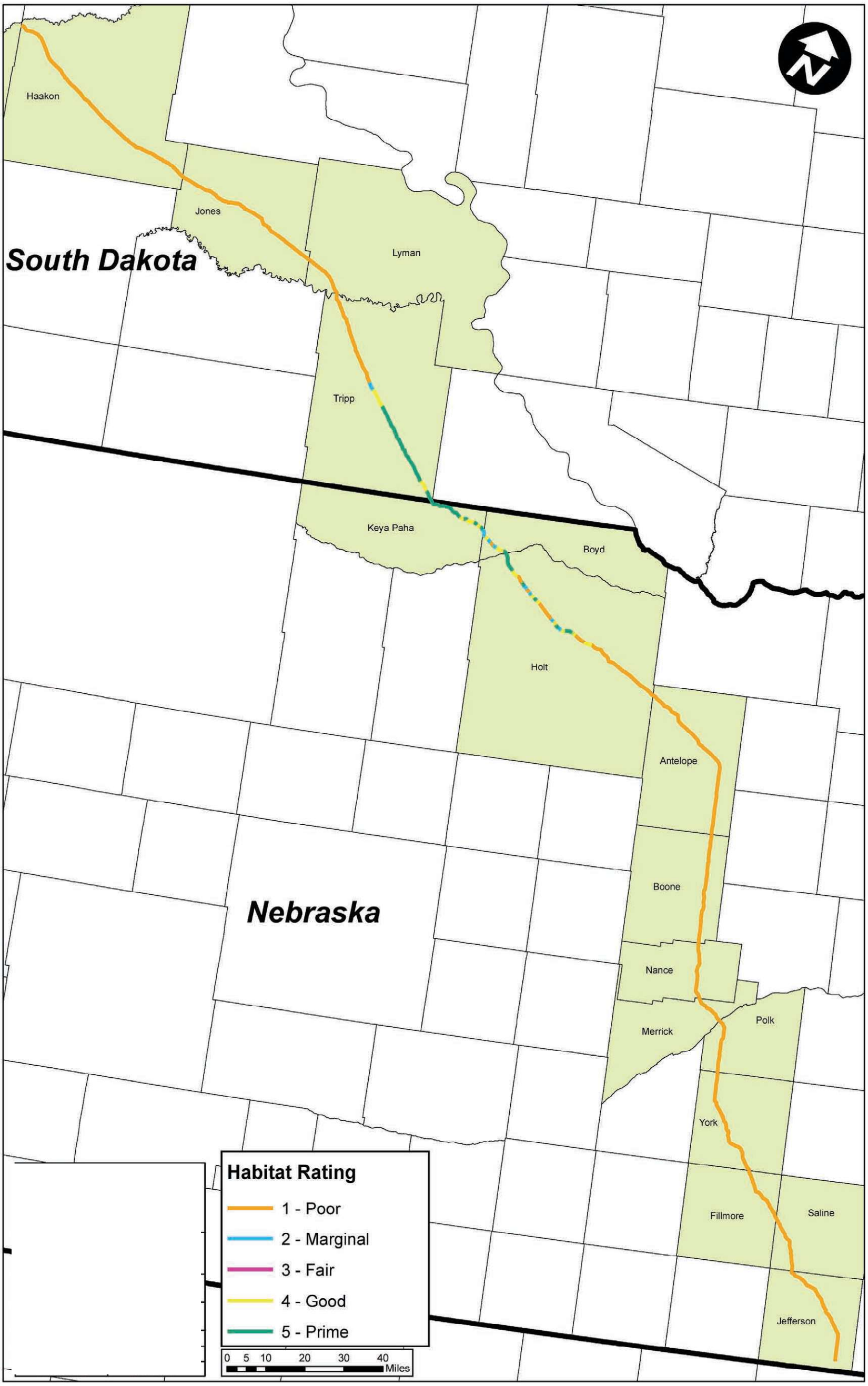

Figure 3.1.5-2 American Burying Beetle habitat ratings in South Dakota and Nebraska.

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The following habitat rating criteria were used in Nebraska and were also used for habitat designations in South Dakota:

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 pipeline 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 pipeline ROW with row crop agriculture or habitat with the potential for large amounts of light pollution and disturbance associated with town or city edge.

South Dakota

American burying beetles have been recently collected from three South Dakota counties: Todd, Tripp, and Gregory (Backlund and Marrone 1997). Surveys in 2005, revealed that burying beetles are concentrated in Tripp County where the population is estimated to be approximately 1,000 individuals in an area of approximately 220 square kilometers (54,363 acres) in southern Tripp County (Backlund et al. 2008). The best habitat for the burying beetles in South Dakota is similar to that of the northern Nebraska population and consists of wet meadows in sandy soils with scattered cottonwoods trees (*Populus deltoids*). The proposed Project would cross approximately 35 miles of American burying beetle habitat that is either classified as prime, good, fair, and marginal. As shown in Table 3.1-3, 220 acres of American burying beetle habitat in South Dakota would be permanently impacted from various proposed Project facilities (160 acres prime, 48 acres good, 0 acres fair, and 12 acres marginal). Temporary impacts to American burying beetle habitat from proposed Project construction activities in South Dakota would be 408 acres. Of the acres impacted, approximately 208 acres of prime and good habitat would be permanently impacted from various proposed Project facilities, and 310 acres of prime and good habitat would be temporarily impacted from Project facilities in South Dakota. American burying beetles are unlikely to occur in fair, marginal, or poor habitat.

Thermal modeling, discussed below, indicates that pipeline operation would have thermal effects in an area above the pipeline in the northern portions of the American burying beetle's range and that thermal effects may include an area out to 11 feet on either side of the pipeline (22-foot wide area). This estimated 22-foot-wide area would experience potential permanent thermal effects which would result in this area remaining above freezing during portions of the American burying beetle over-wintering period which could affect overwintering beetles by increasing their metabolic demand and reducing survival and productivity (Table 3.1-3). The area stabilized by gravel platforms for the above-ground facilities would result in an estimated 10 acres of

permanent impact to prime and good habitats that would also be likely to support American burying beetles (Table 3.1-3).

Table 3.1-3 South Dakota American Burying Beetle Habitat Suitability Acreage

Permanent Impact	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW[a])	0.00	12.13	0.00	48.50	150.32
Pump Stations	0.00	0.00	0.00	0.00	8.42
Permanent Access Road Easement	0.00	0.00	0.00	0.00	1.27
Total Acres	**0.00**	**12.13**	**0.00**	**48.50**	**160.01**
Temporary Impact					
Temporary Easement (CL ROW)	0.00	14.17	0.00	57.84	179.07
Additional Temporary Workspace (CL ROW)	0.00	3.37	0.00	10.80	30.91
Auxiliary Site	0.00	0.00	80.01	0.00	29.50
Temporary Access Road Easement	0.00	0.20	0.00	0.00	2.28
Total Acres	**0.00**	**17.74**	**80.01**	**68.64**	**241.75**

[a] CL ROW = centerline of the right-of-way.

In South Dakota, American burying beetles are known to occur south of State Highway 18 in the southern half of Tripp County (Backlund et al. 2008).

Suitability ratings of American burying beetle habitat crossed by the proposed Project in South Dakota are provided in Table 3.1-4 and Figure 3.1.5-2.

Proposed pipeline corridor adjustments were made in South Dakota during the Nebraska reroute planning and analysis. As shown in Table 3.1-4 below, the adjusted proposed route in South Dakota would impact about 25 miles of prime habitat, 8 miles of good habitat, and 2 miles of marginal habitat.

Table 3.1-4 Suitability Ratings of American Burying Beetle Habitat in Route Modifications in South Dakota

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Tripp	566				x		Agricultural lands with creek bottoms
Tripp	567				x		Agricultural lands with creek bottoms
Tripp	568		x				Grassland Transition Zone
Tripp	569		x				Grassland Transition Zone
Tripp	570		x				Grassland Transition Zone
Tripp	571		x				Grassland Transition Zone
Tripp	572		x				Grassland Transition Zone
Tripp	573	x					Soil changes to sandy loam, drier
Tripp	574	x					Sub-irrigated Meadows
Tripp	575	x					Sub-irrigated Meadows

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Tripp	576	x					Sub-irrigated Meadows
Tripp	577	x					Sub-irrigated Meadows
Tripp	578	x					Wet meadows
Tripp	579	x					Sub-irrigated Meadows
Tripp	580	x					Sub-irrigated Meadows
Tripp	581	x					Sub-irrigated Meadows
Tripp	582	x					Sub-irrigated Meadows
Tripp	583	x					Sub-irrigated Meadows
Tripp	584	x					Sub-irrigated Meadows
Tripp	585	x					Sub-irrigated Meadows
Tripp	586	x					Sub-irrigated Meadows
Tripp	587	x					Includes pump yard 20 site 1
Tripp	588	x					Sub-irrigated Meadows
Tripp	589	x					Sub-irrigated Meadows
Tripp	590	x					Sub-irrigated Meadows
Tripp	591	x					Sub-irrigated Meadows
Tripp	592	x					Sub-irrigated Meadows
Tripp	593	x					Sub-irrigated Meadows
Tripp	594	x					Sub-irrigated Meadows
Tripp	595		x				Upland, sandier, drier, hayed
Tripp	596		x				Upland, sandier, drier
Tripp	597		x				Upland, sandier, drier
Tripp	598	x					Includes area for pump station-21 and access road
Tripp	599	x					Sub-irrigated Meadows
Tripp	600	x					NE border
Total Miles		**25**	**8**	**0**	**2**	**0**	

Nebraska

As shown on Table 3.1-5, approximately 372 acres of American burying beetle habitat would be permanently impacted in Nebraska from the proposed Project. Of the 372 acres impacted, about 140 acres are considered prime habitat, 97 acres good, 0 acres fair, and 63 acres marginal.

Table 3.1-5 Estimated American Burying Beetle Habitat Acreage Impacts in Nebraska

Permanent Impact	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW)	72.73	48.48	0.00	96.51	139.70
Pump Stations	0.05	14.99	0.00	0.00	0.00
Permanent Access Road Easement	0.00	0.00	0.00	0.00	0.00
Total Acres	**72.78**	**63.47**	**0.00**	**96.51**	**139.70**
Temporary Impact					
Temporary Easement (CL ROW)	87.27	56.51	0.00	115.73	165.02
Additional Temporary Workspace (CL ROW)	5.63	3.84	0.00	9.75	16.64
Auxiliary Site[a]	104.62	30.10	0.00	33.36	90.65
Temporary Access Road Easement[a]	0.00	5.08	13.44	13.70	15.02
Total Acres	**197.52**	**95.53**	**13.44**	**172.54**	**287.34**

[a] Includes potential site locations in Spread 8.

CL ROW = centerline of right-of-way.

American burying beetles occur in two Nebraska regions. They occur in the loess canyons in the south, and in the Sandhills. This northern population of American burying beetles is concentrated in Holt, Garfield, and Rock counties. A preliminary range map was recently developed based on presence of American burying beetles from previous studies in Nebraska and a windshield survey to categorize suitable habitat based on land use (Figure 3.1.5-3, and 3.1.5-4 [Jurzenski and Hoback 2010]).

Suitability ratings of American burying beetle habitat crossed by the proposed Project in Nebraska are provided in Table 3.1-6 and Figure 3.1.5-2. As shown in Table 3.1-4 below, the adjusted proposed route in Nebraska would impact about 23 miles of prime habitat, 16 miles of good habitat, 8 miles of marginal habitat, and 12 miles of poor habitat.

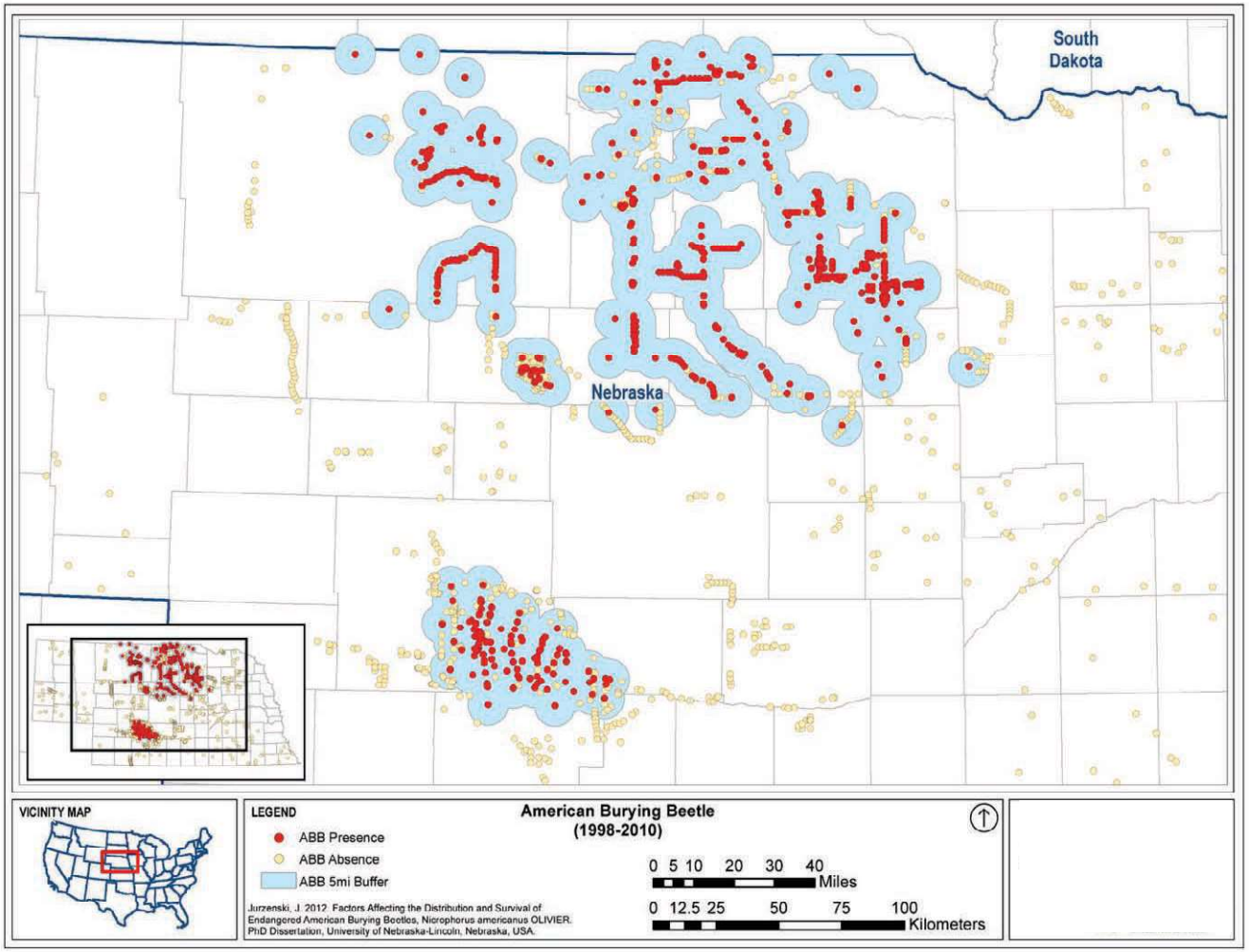

Figure 3.1.5-3 Preliminary Range of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010)

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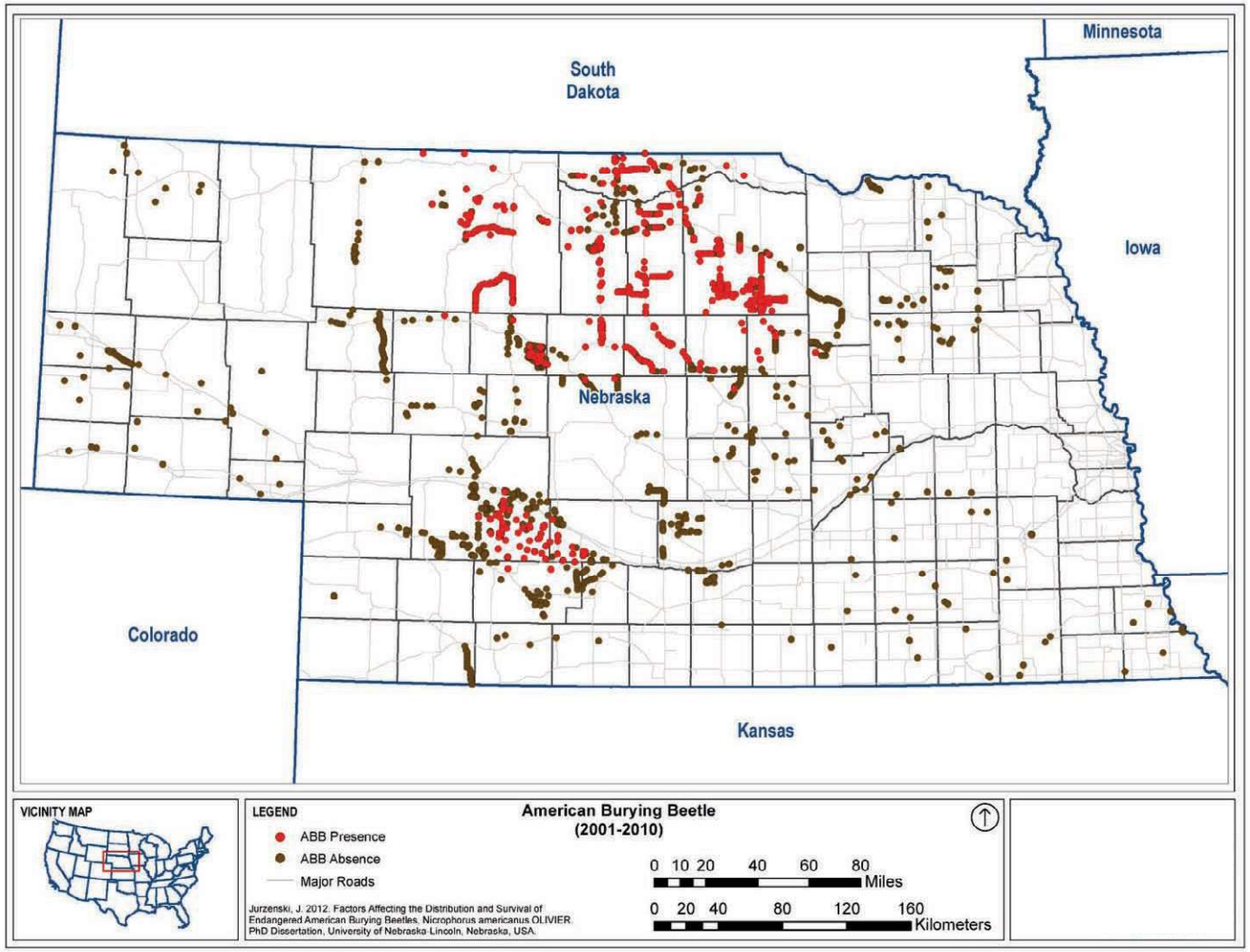

Figure 3.1.5-4 Descriptive Map of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010)

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Table 3.1-6 Suitability Ratings of American Burying Beetle Habitat in Route Modifications in Nebraska

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Keya Paya	601	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	602	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	603	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	604	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	605	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	606	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	607	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	608	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	609	x					Includes access road 304.
Keya Paya	610		x				At Wolf Creek. Includes access road 305. Disturbance around house
Keya Paya	611	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	612		x				Some terracing and agriculture.
Keya Paya	613		x				State Highway 12, upland.
Keya Paya	614	x					Open range.
Keya Paya	615		x				Modest agricultural disturbance.
Keya Paya	616	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	617				x		Includes access road 306, along row crop.
Boyd	618				x		Includes access roads 307 and 308
Boyd	619		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Boyd	620				x		Row crop agriculture or alfalfa fields in the right-of-way.
Boyd	621					x	Center pivots.
Boyd	622				x		Row crop agriculture or alfalfa fields in the right-of-way.
Boyd	623		x				Rangeland or hayfields with somewhat dry

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
							conditions or absence of cottonwoods.
Boyd	624		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Boyd	625	x					Niobrara River
Holt	626	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	627	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	628	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	629	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	630	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	631		x				Hayfield with alfalfa.
Holt	632		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	633					x	Center-pivot.
Holt	634					x	Center-pivot.
Holt	635	x					Includes access road 311.
Holt	636				x		Row crop agriculture or alfalfa fields in the right-of-way.
Holt	637					x	Row crop agriculture in all directions.
Holt	638				x		Row crop agriculture or alfalfa fields in the right-of-way.
Holt	639		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	640	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	641		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	642					x	Row crop agriculture in all directions.
Holt	643					x	Row crop agriculture in all directions.
Holt	644					x	Row crop agriculture in all directions.
Holt	645					x	Row crop agriculture in all directions.
Holt	646					x	Row crop agriculture in all directions.
Holt	647				x		Row crop agriculture or alfalfa fields in the right-of-way.
Holt	648		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Holt	649	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	650				x		Row crop agriculture or alfalfa fields in the right-of-way.
Holt	651		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	652	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	653	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	654		x				Pump station 22 is in marginal habitat because the range west is prime but a center-pivot is directly east.
Holt	655					x	Row crop agriculture in all directions.
Holt	656					x	Row crop agriculture in all directions.
Holt	657					x	Row crop agriculture in all directions.
Holt	658		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	659		x				Connects to 281 north of O'Neil/
Total Miles		**23**	**16**	**0**	**8**	**12**	

The proposed Project passes through three counties in Nebraska with known American burying beetle presence (Keya Paha, Boyd, and Holt counties), and one county with historic occurrence (Antelope County) (Hoback 2012). The proposed route then passes through a number of central and southern Nebraska counties where the American burying beetle has not been found historically or in the past 10 years during surveys for the species.

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 5 trap nights following the trapping methods advocated by the USFWS and NGPC. 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. No American burying beetles were found in Boyd or Antelope counties. In Keya Paha County, American burying beetles were found at 9 locations of 14 new sites surveyed. In Holt County, American burying beetles were found at 19 new sites of 29 sites surveyed (Figure 3.1.5-5 and Figure 3.1.5-6). Capture rates ranged from 0 American burying beetles per trap night, 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.

Control traps were run 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 Sandhills.

Based on 2012 presence/absence sampling, approximately 50 miles of the reroute in Nebraska would affect habitat occupied by low numbers of American burying beetles. The proposed Project route in Nebraska passes through approximately 50 miles of occupied habitat of which only 10 percent had captures of greater than two American burying beetles per trap night (Figure 3.1.5-6). Prior to 2010, Nebraska American burying beetle trapping protocol required three-night surveys, but in 2010 the protocol changed to five-night trapping surveys. 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 appears to be a more important indicator of abundance compared to soil moisture.

Oil transport through the pipeline creates heat that is dissipated through the soil to the ground surface. TQUEST geothermal models (TQUEST, A General Purpose, Finite-Element Program for One, Two and Three Dimensional Heat Transfer, Northern Engineering and Scientific, Appendix F, Pipeline Temperature Effects Study) was used to predict soil temperature changes at the ground surface and at various depths and distances from the center of the pipeline. Combined with general assumptions about American burying beetle life history, it is possible to estimate whether adverse impacts to the American burying beetle would likely result from the rise in soil temperatures caused by pipeline operation.

In northern areas of the American burying beetle range, in Nebraska and South Dakota, soil temperatures decline 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 prohibited 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 typically reach about 60°F. This may result in American burying beetles above ground without the ability to feed appropriately, or to use more energy resources to rebury themselves in the soil, assuming temperatures permit such activity.

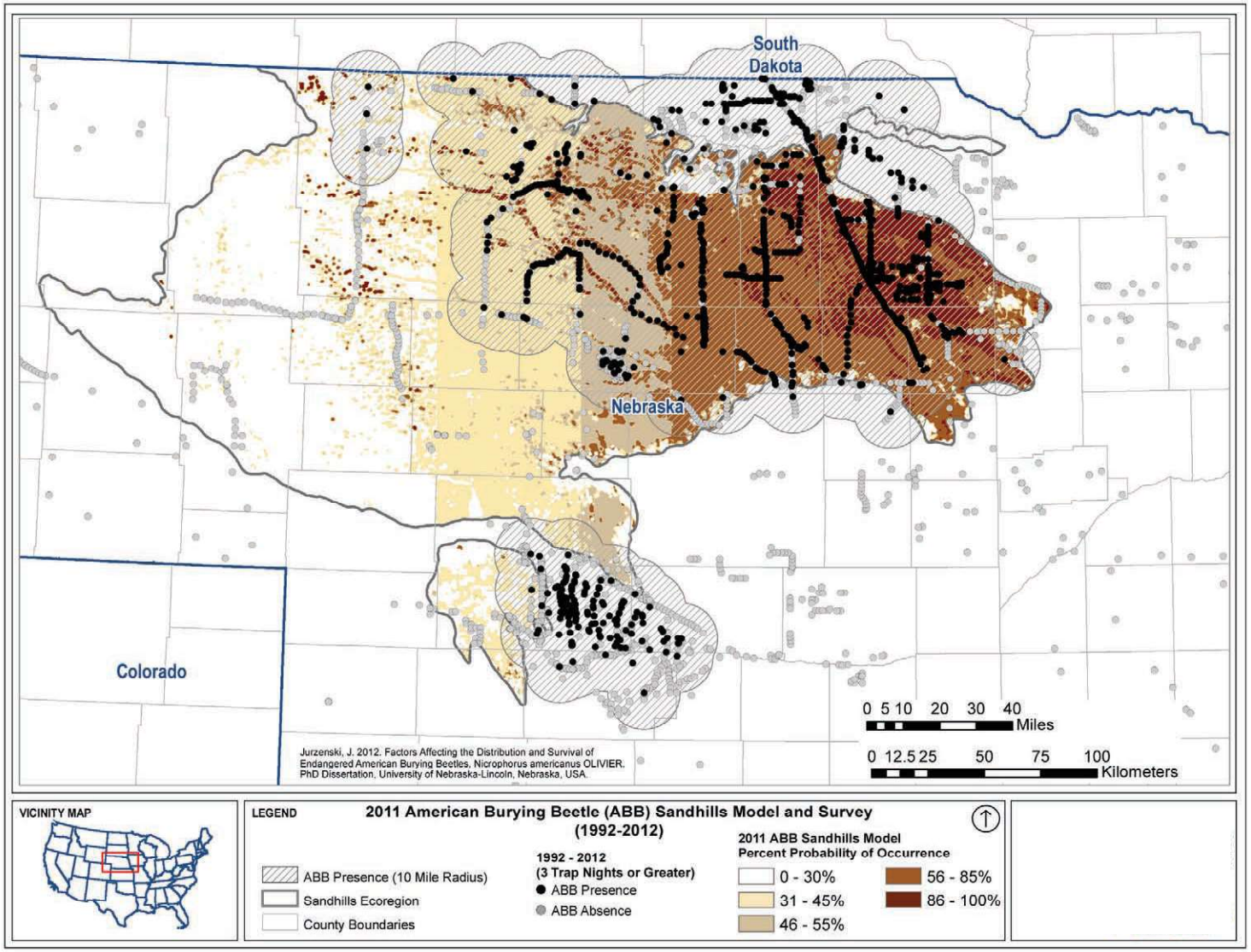

Figure 3.1.5-5 Results of 2012 sampling in relation to proposed reroute.

Note: American burying beetles were found in Keya Paha and northern Holt Counties but were not found east of Highway 183.

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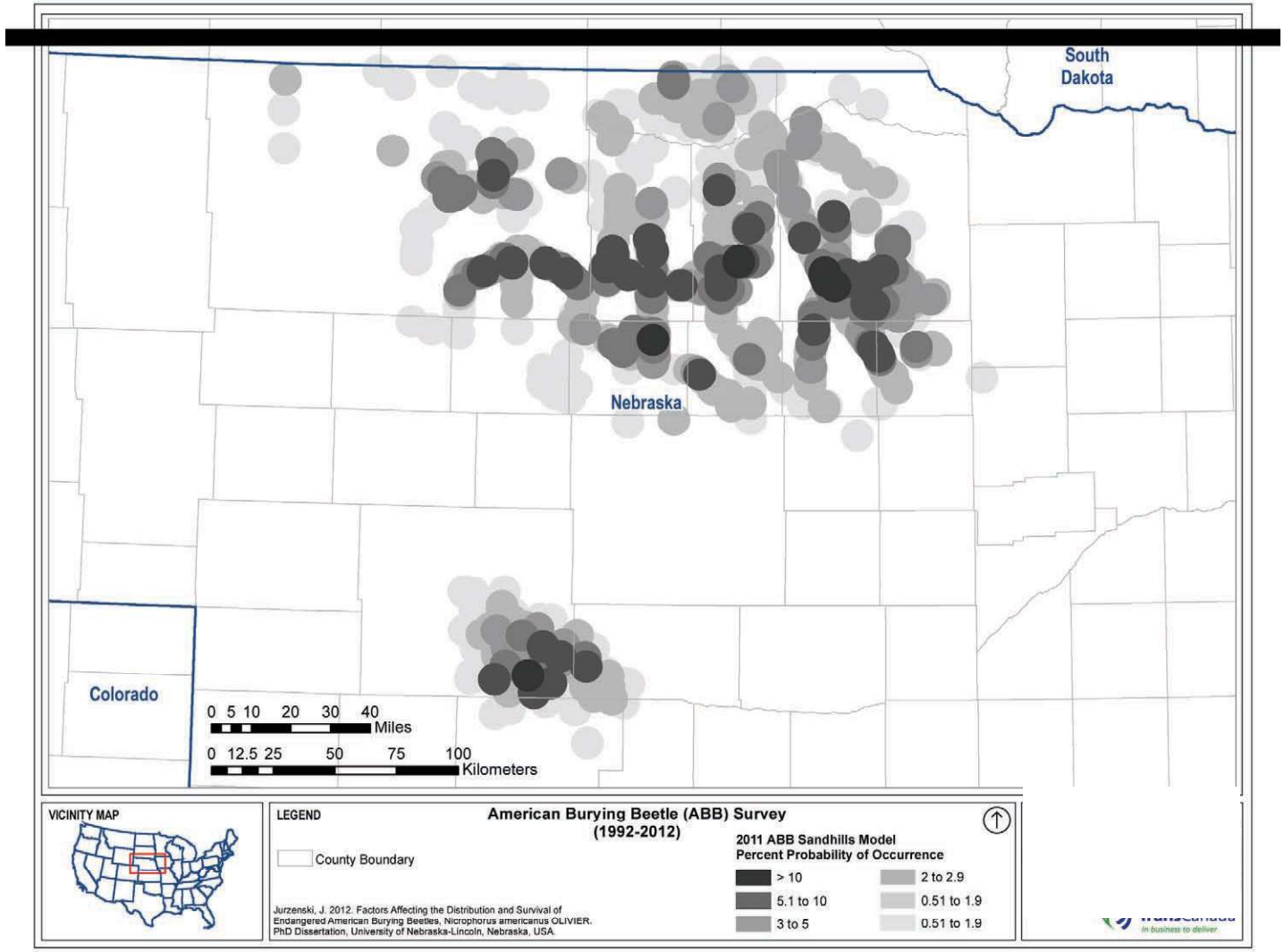

Figure 3.1.5-6 Trap data 1999-2012 where American burying beetle per trap night for three trap nights[1] are plotted (with a five mile buffer) as an estimate of American burying beetle density.

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

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A complicating factor in evaluating thermal impacts to overwintering American burying beetles is that the impacts 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 6 cm (2.4 inches) with some as deep as 20 cm (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 60 cm underground (approximately 24 inches) (Wilson and Fudge 1984, Pukowski 1933, and Hinton 1981; as cited in Scott 1998).

The American burying beetle is the largest carrion beetle in North America (Ratcliffe 1996), and Eggert and Sakaluk (2000) found that larger beetles buried carcasses deeper in the soil. For the Pipeline Temperature Effects Study (Appendix F), 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 center line and within two soil types at different water saturations (Table 3.1-6). The analysis was completed using a pipeline heat dissipation model to predict underground temperature changes resulting from operation of the proposed pipeline (Appendix F, Pipeline Temperature Effects Study). The temperature model predicts that background temperatures (i.e., temperatures 80 feet from the pipeline center line) would remain frozen during the winter at a depth of 24 inches within all but the driest of the two types of soils SH1 and SH4 (Table 3.1-6). In the three sandy soils prevalent in the Sandhills (i.e., SH4, SH5, and SH6), background temperatures at 12 inches depth equaled or fell below 32°F during seven or eight, 2-week time periods during the winter. However, at 11 feet from the pipeline centerline (22-foot wide sub-corridor), soil remained frozen during four and six 2-week time periods (i.e., in SH5 and SH6), and did not freeze during the winter in SH4 soils (Table 3.1-6).

Table 3.1-6 Incidence of Modeled Soil Temperatures at Freezing or Below with Varying Distance from the Pipeline Centerline at Varying Depths[a]

	Silty Loam Soil			Sandy Soil		
Distance from Center Line	**SH1 5% Moisture Content**	**SH2 18% Moisture Content**	**SH3 37% Moisture Content**	**SH4 5% Moisture Content**	**SH5 14% Moisture Content**	**SH6 28% Moisture Content**
80 ft (back ground)	**8-9**-6-0[b]	8-8-**7-3**	9-**8-8-2**	8-**8-7**-0	8-**8-7-4**	9-**8-8-5**
11 ft.	8-**7-0**-0	8-8-**5-0**	9-**7-6-0**	8-**5-0**-0	8-**7-4-0**	9-**7-6-0**
7 ft.	8-5-0-0	8-6-0-0	7-6-0-0	7-3-0-0	7-5-0-0	7-6-0-0
3 ft.	8-2-0-0	6-0-0-0	5-0-0-0	6-0-0-0	4-0-0-0	4-0-0-0

[a] Freezing or below considered ≤ 32 °F

[b] Incidence of temperatures ≤ 32 ºF. are described in a W-X-Y-Z format, where:
W is the incidence of freezing at the ground surface,
X is the incidence of freezing at a depth of 6 inches,
Y is the incidence of freezing at 12 inches, and
Z is the incidence at 24 inches deep.

Temperature output is modeled at 2-week intervals. Differences in incidence of frozen soil between background (80 feet) and at 11 feet from the center of the pipeline (i.e., a 22-foot sub-corridor) are shown in red.

Modeling predicted a reduction in the incidence of frozen soils from 25 percent (twice) to 100 percent (twice) at a depth of 12 inches and 11 feet from the pipeline centerline. The estimated total duration of unfrozen soils would likely be sufficient to adversely affect American burying beetles overwintering within 11 feet from the pipeline centerline, based on the 2-week time period summaries (Appendix F, Pipeline Temperature Effects Study). 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 measureable differences that are likely biologically significant for American burying beetles can be identified out to 11 feet from the pipeline centerline based on the available model (Appendix F, Pipeline Temperature Effects Study).

3.1.5.3 Impact Evaluation

Construction

Direct impacts to American burying beetles as a result of construction during vegetation clearing, site grading, and trench excavation would result in temporary habitat loss, potential alteration of suitable habitat to unsuitable habitat, temporary habitat fragmentation where the pipeline is not already co-located with other utilities, and potential mortality to eggs, larvae, and adults through construction vehicle traffic and exposure during excavation. Artificial lighting has the potential to 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, SPCC Plan and ERP) for potential construction-related fuel spills which would mitigate and avoid any short-term impacts.

Burying beetles, including the American burying beetle, are sensitive to soil moisture and die quickly 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. During restoration, 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 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. Compaction resulting from construction would typically be relieved as follows:

- Compacted cropland would be ripped a minimum of three passes at least 18 inches deep and all pasture would be ripped or chiseled a minimum of three passes at least 12 inches deep before replacing topsoil.
- Areas of the construction ROW that were stripped for topsoil salvage would be ripped a minimum of three passes (in cross patterns, as practical) prior to topsoil replacement. The approximate depth of ripping would be 18 inches (or a lesser depth if damage may occur to existing drain tile systems). After ripping, the subsoil surface would be graded smooth and any subsoil clumps broken up (disk and harrow) in an effort to avoid topsoil mixing.
- The Contractor would test the decompacted construction ROW at regular intervals for compaction in agricultural and residential areas. Tests would be conducted on the same soil type under similar moisture conditions in undisturbed areas immediately adjacent to the ROW to approximate pre-construction conditions. Penetrometers or other appropriate devices would be used to conduct tests.
- Topsoil would be replaced to pre-existing depths once ripping and disking of subsoil is complete up to a maximum of 12 inches. The contractor would alleviate topsoil compaction on cultivated fields with cultivation methods.
- 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 office would be consulted by Keystone and the landowner.

In the first year after construction, Keystone would inspect the ROW to identify areas of erosion or settling. Subsequently, Keystone would monitor erosion and settling through aerial patrols, which are part of Keystone's Integrity Management Plan, and through landowner reporting. Keystone is required to monitor the pipeline no more 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 then dispatches crews to repair and address the issues that are found (see also Appendix B, CMRP, Section 4.16).

The final seed mix for revegetating the ROW would be based on input from the NRCS, appropriate state wildlife resource agencies (in South Dakota and Nebraska), and the availability of seed at the time of restoration. However, the landowner may request specific seeding requirements during easement negotiations that may not include seeds from native plant communities or be consistent with previous land use. Keystone would be required to comply with these specific requests and would be unable to require the landowner to re-establish native plant communities on private lands. The following provisions from the Project CMRP apply to ROW revegetation:

- 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 must be approved by Keystone prior to use. Seeding must follow cleanup and topsoil replacement as closely as possible. Seed must be applied to all disturbed surfaces (except cultivated fields unless requested by the landowner) as indicated on the construction drawings.

- Weather conditions, construction ROW constraints, site access, topography, and soil type will influence the seeding method to be used (i.e., drill seeding versus broadcast seeding).
- The contractor would plant seed at depths consistent with the local or regional agricultural practices.
- Hydro seeding may be used, on a limited basis, where the slope is too steep or soil conditions do not warrant conventional seeding methods.
- Keystone would work with landowners to discourage intense livestock grazing of the construction ROW during the first growing season by using temporary fencing or deferred grazing, or increased grazing rotation frequency.

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 impacts to American burying beetle habitat.

USFWS recommends continued consultation consistent with Section 7 of the ESA to develop avoidance, minimization, and mitigation strategies for this species. Such strategies will likely include carrion removal, mowing, and windrowing, downshielding of light sources, use of sodium vapor lights, capture relocation procedures, and habitat mitigation. However, mowing, windrowing, and capture relocation techniques are not approved avoidance and minimization techniques in South Dakota.

In addition to the conservation measures outlined above, the Pierre, South Dakota USFWS Ecological Services Field Office has recommended the following additional measures to protect the American burying beetle:

- Construction camp near Winner, South Dakota, should be built on cropland very close to Winner, and/or north of Highway 18 in Tripp County.
- Two pipe stockpile sites planned for Tripp County should be placed on cropland, or north of Highway 18.
- Gregory County, South Dakota, contractor yard should be built on cropland, or north of Highway 18.
- Because the American burying beetle is attracted to light at night, working at night with lights in southern Tripp County should be avoided. If working at night cannot be avoided, lighting should only be used between September 1 and June 1.

Operation

The activity period for the American burying beetle across its range is usually late April through September (USFWS 1991). Active periods are associated with night air temperatures, with peak activity occurring when night temperatures are 60°F or greater at midnight. Upon emergence from overwintering, American burying beetles seek a suitable carcass upon which to reproduce. They

spend approximately six weeks underground attending the carcass followed by emergence of the new brood in early August.

These 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 (assuming that the beetles do not possess mechanisms to survive freezing). Schnell et al. (2008) found that in Arkansas, surviving American burying beetles overwintered at an average depth of 6 cm (2.4 inches) with some as deep as 20 cm (8 inches). Additionally, reproductive chamber depths are described as "several inches" by Ratcliffe (1996, p. 46), or up to 60 cm underground (approximately 24 inches) (Wilson and Fudge 1984, Pukowski 1933, and Hinton 1981; as cited in Scott 1998).

The American burying beetle is the largest carrion beetle in North America (Ratcliffe 1996), and Eggert and Sakaluk (2000) found that larger beetles buried carcasses deeper in the soil. During daily periods of inactivity, American burying beetles and *Nicrophorus orbicollis*, a closely related, nocturnal species bury to approximately 24 cm (10 inches).

TQUEST geothermal models (Appendix F, Pipeline Temperature Effects Study) of pipeline effects to surrounding soils, calculated at ultimate capacity operating flow rates for the proposed Project (830,000 bpd), 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 F, Pipeline Temperature Effects Study). The actual overwintering behavior and location for American burying beetles is currently unknown but several studies have concluded that overwintering results in approximately 30 percent mortality (Schnell et al. 2008).

Factors that affect soil temperature could increase the 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 potentially affects 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 F, Pipeline Temperature Effects Study).

Adverse effects to American burying beetle resulting from a crude oil spill from the pipeline are highly improbable due to the low probability of a spill, low probability of a spill coinciding with the presence of American burying beetles, and low probability of an American burying beetle contacting the spilled product (See Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis).

Lights associated with aboveground facilities, particularly if the lights emit wave lengths in the UV spectrum, may attract American burying beetles, as they are known to be positively phototrophic. However, only one sodium vapor light with downshield attached above each pump station door would be used. Pump stations within American burying beetle habitat represent permanent habitat loss.

Power Lines and Substations

Some power distribution lines to pump stations coincide with areas of potentially suitable habitat or occupied habitat, including:

- Tripp County, South Dakota – Pump Station 21 – good habitat.
- Holt County, Nebraska – Pump Station 22 – low quality habitat.

Construction and maintenance of power lines to these pump stations could affect the American burying beetle. Keystone has informed power providers of the requirement to consult with USFWS concerning the construction and operation of the power distribution lines. No other actions connected to the proposed Project would coincide with the currently occupied range of the American burying beetle.

Cumulative Impacts

Other past, present, and foreseeable future projects in South Dakota (as indicated on Figure 2.2.3-1) are relatively sparse with significant geographic separation. The American burying beetle does not occur in Montana, therefore the connected action Bakken Marketlink Project would have no impact on the American burying beetle. In South Dakota the Big Bend to Witten 230-kV Transmission Line in Tripp County, would be north of Highway 18 and outside of the suitable habitat for American burying beetles. However, American burying beetle locations in Nebraska occur within the proposed Project and several other projects in proximity to these locations. Furthermore, there are potential impacts to the American burying beetle associated with the concurrent construction of the TransCanada Gulf Coast pipeline project. Construction of new pipelines or other ground disturbing projects through southern South Dakota and north-central Nebraska could contribute to cumulative mortality and loss of habitat. Any additional potential losses within this species would likely require conservation measures, thus reducing overall cumulative impacts on the American burying beetle.

The American burying beetle could likely experience some direct mortality during construction with reduced habitat causing long-term impacts and a delay in population recovery. To minimize this impact several avoidance and conservation measures would be implemented. Any future projects in the area that reduce and fragment preferred habitat for the burying beetle may provide the potential for additive cumulative effects to this species. Any additional potential losses would likely require similar conservation measures and mitigations, thus reducing overall cumulative impacts on the American burying beetle.

3.1.5.4 Conservation Measures

The following conservation measures have been discussed and would be implemented to avoid, minimize, and compensate for impacts to the American burying beetle:

- Prior to construction disturbance and grading for the ROW, trapping and relocating American burying beetles would be implemented only in Nebraska where access is available to remove adult beetles from the construction ROW in accordance with the Nebraska American Burying Beetle Trapping Protocol (USFWS and NGPC 2008;). Trapping and relocating American burying beetles is not authorized in South Dakota.

- Mowing and windrowing vegetation would be conducted during the trap and relocate period to temporarily reduce habitat suitability by drying out the soil surface. Mowing would be done so that vegetation is at most 8 inches in height. Windrowing would be done to remove vegetation residue. Mowing and windrowing would be implemented only in Nebraska. Mowing and windrowing cannot be used in South Dakota as an avoidance and minimization measure.
- After the trap and relocate efforts are completed, the ROW would be disturbed (graded) prior to the next June American burying beetle active period in Nebraska (e.g., trap and relocate efforts take place during the August active period, and the ROW disturbance would take place prior to the following June active period).
- In areas where the ROW could not be disturbed (graded) before the next active period, trap and relocate efforts would be repeated in Nebraska (e.g., trap and relocate efforts would be repeated during the June active period, and the ROW would be disturbed in August before the following active period).
- After trap and relocate efforts are completed in Nebraska, a biologist would travel the ROW every couple of days during the American burying beetle active period (June through September) to remove any carcasses that may be present within the ROW.
- During construction in the American burying beetle range in Nebraska, a biologist would travel the ROW every couple of days during the American burying beetle active period (June through September) to remove any carcasses that may be present within the ROW.
- Keystone would train all workers operating in American burying beetle habitat and would include discussion of American burying beetle habitat, biology, reasons for their decline, and responsibilities of all workers for the protection of the American burying beetle (including removing food wastes from the ROW each day, reporting any American burying beetle sightings to an environmental inspector, and avoiding bringing dogs and cats to the ROW). Keystone will produce a full color Endangered Species Card with a picture of the American burying beetle and all of this information summarized on the card. The card will be handed out to all construction workers operating in American burying beetle habitat.
- Signs would be posted at all access points to the ROW highlighting the areas as American burying beetle habitat and reminding workers to follow special restrictions in the area.
- Keystone would down-shield lighting and install sodium vapor-type lights at ancillary facilities within areas occupied by the American burying beetle to avoid attracting American burying beetles to the construction or operation site.
- Keystone would provide compensation for temporary construction and permanent operations impacts to the American burying beetle as part of a habitat conservation Trust in areas where American burying beetles are likely to be impacted including: southwest of Highway 18 in Tripp County, South Dakota; Keya Paha, and Holt counties in Nebraska. Compensation would be based on total acres impacted where American burying beetle presence was confirmed. Compensation would be based on a total acres impacted and would be modified by habitat quality rating multipliers with prime habitat compensation at 3 times the total impact acres; good habitat at 2 times the total impact acres; fair habitat at 1 times the total impact acres; and

marginal habitat at 0.5 times the total impact acres. No compensation would be provided for poor habitat. In Nebraska only, no compensation would be provided for habitat where no American burying beetles have been found. In South Dakota, compensation would be provided based on only habitat quality rating multipliers and not American burying beetle survey information. No American burying beetle surveys will be done in South Dakota. Temporary habitat impacts would be scaled for the period of time anticipated for recovery of vegetation cover at 4 years over the 50-year life of the proposed Project or 8 percent of total calculated impacts. All compensation would be based on habitat ratings and compliant with agreements between the Department, USFWS, and Keystone.

- Keystone would provide funding for compliance monitoring. The Department would designate USFWS or an agreed-upon third-party, such as a nongovernmental organization, that would work with USFWS to ensure that vegetation restoration efforts were successful for American burying beetle habitat, as discussed during consultation between the Department, USFWS, and Keystone.
- Keystone may set aside funds for a restoration performance bond. The bond would be applied to supplemental vegetation restoration that could be necessary if restoration for American burying beetle habitat failed, as discussed during consultation between the Department, USFWS, and Keystone.

With respect to these conservation measures, it is noted that the NGPC and USFWS recommend trapping and relocating American burying beetles only in Nebraska prior to construction, as an avoidance procedure designed to reduce the total number of beetles possibly taken by the proposed Project construction. Trapping and relocating would result in take of American burying beetles through handling and release, away from the proposed project site. Such take may be authorized only in a USFWS Biological Opinion incidental take statement.

Conversely, the Pierre, South Dakota USFWS Ecological Services Field Office and SDGFP do not recommend trapping and relocating American burying beetles in South Dakota. According to the South Dakota USFWS Ecological Services Field Office, recommended conservation measures for American burying beetles to offset Project impacts include providing compensation to be used for American burying beetle conservation in states affected by the proposed Project.

3.1.5.5 Determination

Effect on Critical Habitat

Critical habitat has not been designated for the American burying beetle. Therefore, the proposed Project would not result in the destruction or adverse modification of federally designated critical habitat for the American burying beetle.

Effect on the Species

The proposed Project "may affect, and is likely to adversely affect" the American burying beetle. This determination is based on the location of the proposed Project within the known range and habitat of the American burying beetle and the results from surveys along the proposed Project route. Further, this determination is balanced by Keystone's commitment to mow and windrow suitable habitat for the species and collect carrion along the proposed Project construction site in Nebraska. Implementation of trap and relocation efforts in Nebraska and project construction and

operation in South Dakota without trap and relocation efforts, mowing, and windrowing could result in the incidental take of American burying beetles during construction or operation of the proposed pipeline. The USFWS will estimate incidental take and will issue an incidental take statement for the proposed Project. Keystone will implement conservation measures including providing compensation for impacts to the American burying beetle based on the total acres of occupied habitats that would be altered. Monetary compensation will be applied to conservation efforts for the species.

3.2 FEDERALLY THREATENED

3.2.1 Piping Plover - Threatened

3.2.1.1 Natural History and Habitat Association

The piping plover (*Chardrius melodus*) was listed as endangered and threatened December 11, 1985 (50 FR 50726). 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 within the proposed Project 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 (67 FR 57638) in Montana, Nebraska, North Dakota, and South Dakota in 2002 (USFWS 2002), but the Nebraska critical habitat was later remanded (67 FR 57638) (USFWS 2009). The proposed Project does not cross designated critical habitat.

Historically, piping plover bred across three geographic regions: United States 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 United States 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 2012b). Nesting season for the piping plover is from April 15 through September 1. 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 kilometers 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.

3.2.1.2 Potential Presence in Project Area

Keystone XL Pipeline Project

Presence of breeding piping plovers along the proposed Project 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 proposed Project area. Potential nesting habitat within the proposed Project area for the piping plover is restricted to sandy beaches and sandbars along the Platte, Loup, and Niobrara rivers in Nebraska and alkali wetlands and the Fort Peck Reservoir in Montana (Atkinson and Dood 2006, 67 FR 57638). 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 Project area (AECOM 2009g).

Montana

Birds breeding in Montana are found nesting in 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. Additional consultation with the USFWS Billing Ecological Services Field Office (AECOM 2009g) indicates that historic surveys have failed to identify nesting piping plover within the proposed Project area. Therefore, surveys are not recommended for the piping plover in Montana.

Nebraska

Birds 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 three rivers crossed by the proposed Project: Niobrara, Loup, and Platte rivers. Piping plovers migrate through Nebraska during both the spring and fall. These crossings were historically identified as critical habitat for the piping plover. Personal communication 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 2008c).

Crossings of the Missouri, Platte, Loup, and Niobrara rivers were surveyed by Keystone in July 2008, June 2011, and June and July 2012 to confirm presence or absence of suitable breeding habitat and breeding piping plovers (2008, 2011, and 2012 surveys for this species are provided in Appendices H, I, and J). One individual foraging plover was identified at the Niobrara River crossing in 2008. No nesting piping plovers were identified within line-of-sight of the ROW crossing of the Missouri, Platte or Loup rivers. Table 3.2-1 summarizes the piping plover survey results from 2008 to 2012. In the winter of 2011, the Missouri River flooded, and suitable piping plover habitat may have also flooded and thus may not have been present that year. 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.

Table 3.2-1 Occurrence Surveys for the Piping Plover along the Proposed Project Right of Way in 2008, 2011, and 2012[a]

State	County	Survey Location	Survey Corridor	Survey Date	Survey Results	Comments
Montana	Valley/ McCone	Missouri River	0.25-mile each side of centerline crossing	June 3 and July 11, 2011	No piping plover observed.	Poor bank and no island nesting habitat, suitable foraging habitat.
Nebraska	Keya Paha/ Rock	Niobrara River	0.25-mile each side of centerline	July 22, 2008, July 7 2011, June 22 - 26, 2012	One piping plover observed in 2008.	Good bank and island nesting habitat, suitable foraging habitat at crossing location.
Nebraska	Nance	Loup River	0.25-mile each side of centerline	July 21, 2008, July 6 & 7, 2011, June 14 - 18 2012	No piping plover observed.	Suitable nesting and foraging habitat at crossing location.
Nebraska	Merrick/ Hamilton	Platte River	0.25-mile each side of centerline	July 22, 2008, July 6 & 7, 2011, July 15 - 20 2012	No piping plover observed.	Good nesting and foraging habitat at crossing location, however very little water present in 2012 due to drought

[a] Survey reports: Appendices H, I, and J.

3.2.1.3 Impact Evaluation

Construction

The primary construction-related impacts would be disturbance and potential exposure to small fuel spills and leaks from construction machinery. The chance of construction-related spills during construction within piping plover habitat is 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, Spill Prevention and Containment (Appendix B). 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."

All river crossings that provide suitable nesting habitat for the piping plover (Niobrara, Loup, and Platte) would be crossed using HDD. There is a potential for HDD frac-outs (accidental releases of pressurized drilling mud from the borehole) to occur during construction. A frac-out could release bentonitic drilling mud into the aquatic environment. Bentonite is non-toxic; the released drilling mud would disperse in flowing water or eventually settle in standing water.

The proposed minimum depth for HDD pipeline sections is 25 feet below the streambed. In some instances, the pressurized fluids and drilling lubricants used in the HDD process may escape the active bore, migrate through the soils, and come to the surface at or near the construction site, an event commonly known as a frac-out. Most leaks of HDD drilling fluids occur near the entry and exit locations for the drill and are quickly contained and cleaned up.

Frac-outs that may release drilling fluids into aquatic environments are 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 best management practices that are described within the HDD contingency plans required for drilled crossings and prepared by the pipeline contractor 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.

Keystone XL Pipeline Project

As indicated, the piping plover is known to nest within or near the proposed Project at the Platte, Loup, and Niobrara rivers in Nebraska and Valley County in the Fort Peck Reservoir in Montana. No direct impacts to the piping plover or its breeding habitat would be anticipated at the Platte, Loup, and Niobrara rivers since pipeline placement across the rivers would be completed using the HDD method. Additionally, based on consultation with the USFWS, no impacts are anticipated along the proposed Project route in Montana (AECOM 2009g).

Indirect impacts 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. Prior to construction-related activities, including HDD and hydrostatic testing that would occur within 0.25 mile from potential breeding habitat, Keystone proposes to conduct presence/absence surveys up to 2 weeks prior to construction-related activities to identify active nest sites, in coordination with the USFWS. If occupied breeding territories and/or active nest sites are identified, the USFWS would be notified and appropriate protection measures would be implemented on a site-specific basis in coordination with the USFWS. Use of down-shielding on lights would be used should night HDD work be planned during nesting season where an active colony is located within 0.25-miles from the proposed HDD site and vegetative screen is lacking.

Impacts to piping plovers from temporary water reductions during hydrostatic testing in the lower Platte River Basin would be avoided based on Keystone's plan to withdraw the volume of water needed at a rate less than 10 percent of the baseline daily flow and to return water back to its source within a 30-day period.

Operations

There are no known occurrences of piping plovers nesting within the proposed Project area; therefore, indirect impacts during aerial and ground surveillance are unlikely to disturb nesting plovers. However, 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.

A spill resulting from a leak in the proposed pipeline is unlikely to affect the piping plover. The major rivers that contain suitable breeding habitat in Nebraska would be crossed by HDD. 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 thereby reducing the potential for piping plover exposure. Additionally, some of the major rivers crossed by the proposed Project which provide nesting or migration habitat for the piping plover are within or in close proximity to USDOT-designated High Consequence Areas and are subject to an intensive integrity management program stipulated by the USDOT (Integrity Management Rule, 49 CFR 195). Further, if a significant spill event were to occur, federal and state laws would require clean up.

Direct contact with a crude oil spill could result in adverse effects to piping plovers due to plumage oiling, crude oil ingestion from contaminated plumage and prey, and crude oil transfer to eggs and young. While these exposure routes have the potential to cause adverse effects to individuals, the probability of adverse effects to piping plovers are unlikely due to the low probability of a spill, low probability of the spill coinciding with the presence of piping plover individuals, and low probability of the spill reaching a major river in sufficient amounts to cause toxic effects. 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.

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 with 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 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 20 feet below the river bottom using the HDD construction method, temperature effects should be negligible. According to Keystone's Pipeline Temperature Effects Study (see Appendix F), 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 used habitats.

Power Lines and Substations

The construction of about 378 miles of new power lines to support the proposed Project would add to the incremental collision mortality of migrant piping plovers, especially where these power lines are located near migration staging, nesting, or foraging habitats. Piping plovers are susceptible to collisions with power lines. Construction of new power line segments across nesting and foraging habitats, including rivers, gravel pits, alkali lakes, and lake shorelines would

also potentially increase predation from raptors by creating perches. Based on the habitat and occurrence surveys for this species at the Platte River crossing, breeding habitat quality within line of sight of the proposed Project centerline was considered to be of good quality.

Avoidance and minimization measures could then be implemented by electrical service providers to minimize or prevent collision risk to foraging interior piping plovers at the Platte River crossing with the use of standard measures as outlined in *Mitigating Bird Collision with Power Lines* (APLIC 1994). Electrical power line providers would be responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments. Keystone has advised electrical power providers of their ESA consultation requirement with the USFWS for the electrical infrastructure component of the proposed Project to prevent impacts to migrating, nesting, or foraging piping plovers. To prevent impacts to nesting and foraging piping plovers and impacts to other threatened and endangered species, electrical power providers have made commitments to consult with the USFWS for the electrical infrastructure components constructed for the proposed Project. These commitments are included in Appendix A, Letters of Section 7 Consultation Commitments from Power Providers. Conservation measures applicable to power lines are presented below.

3.2.1.4 Cumulative Impacts

The proposed Project could potentially affect four federally protected or candidate migratory birds (whooping crane, piping plover, interior least tern, and Sprague's pipit) within their migration range from Nebraska to Montana and/or within their breeding habitats. Conservation measures proposed for three of these birds (i.e., whooping crane, piping plover, and interior least tern) include protection of river and riparian nesting and migration staging habitats through use of HDD crossing methods and site-specific surveys to avoid disturbance to migration staging, nesting, and brood-rearing individuals. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize effects to these birds.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for the four federally protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds, including the greater sage-grouse (although not a migratory bird), interior least tern, piping plover, and Sprague's pipit.

Impacts to federally protected and candidate species from the construction and operation of the connected actions (Bakken Marketlink Project, Big Bend to Witten 230-kV Transmission Line, and Electrical Distribution Lines and Substations) would be long term or permanent. The greater sage-grouse, Sprague's pipit, and federally protected species may be impacted by habitat loss resulting from construction of the Bakken Marketlink Project, along with future projects in the area that reduce and fragment preferred habitat for these species. However, habitat loss would be mitigated and any additional potential habitat loss would likely require similar conservation methods and mitigations, thus reducing overall cumulative impacts on these species.

The transmission line, electrical distribution lines, and substations could result in long-term increased bird collisions, bird predation, and habitat loss. However, with implementation of

conservation measures, it is not expected that these lines would have cumulative impacts on birds protected under the MBTA or Bald and Golden Eagle Protection Act. Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds.

3.2.1.5 Conservation Measures

Keystone XL Pipeline Project

The following conservation measures would apply if construction-related activities, including HDD and hydrostatic testing, were to occur during the piping plover nesting season within suitable habitat:

- If construction were to occur during the plover nesting season (April 15 through September 1), Keystone would conduct pre-construction surveys within 0.25 miles from suitable breeding habitat at the Platte, Loup, and Niobrara rivers in Nebraska to ensure that there are no nesting pairs within 0.25 mile of the construction area. Daily surveys for nesting terns should be conducted when construction activities occur within 0.25 mile of potential nesting habitat during the nesting season.
- If occupied piping plover nests are found, then construction within 0.25 mile of the nest would be suspended until the fledglings have left the nest area.
- Directional lighting would be used should night time operations occur during HDD and a vegetative screen is limited.

Power Lines and Substations – All Segments

The following conservation measure would apply to power distribution lines to pump stations which cross rivers with good breeding habitat (and within 0.25 mile of each side) and between rivers and sand and gravel mining areas to reduce current and future potential for injury or mortality to piping plovers:

- Distribution lines supplying power to pump stations should be marked with bird deflectors where 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.

Additional conservation measures to avoid or minimize adverse impacts to piping plovers from new power lines will vary depending on the circumstances, but may also include the following measures.

- Reroute power lines to avoid construction within 0.50 mile of piping plover nesting areas in alkali wetlands in Montana.
- 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.

- If power line construction occurs during the piping plover nesting season, survey potential riverine or sand pit piping plover nesting areas within 0.25 mile of new power lines and within 2 weeks of 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.

3.2.1.6 Determination

Effect on Critical Habitat

Critical habitat designated for the Northern Great Plains population of the piping plover has been vacated by the USFWS in Nebraska. Critical habitat is designated for the piping plover at Fort Peck Reservoir and on the Missouri River downstream of Wolf Point; this is in the vicinity of the proposed Project in Montana. However, based on Keystone's commitment to implement the conservation measures including implementation of HDD and power providers commitments to consult with the USFWS and to implement avoidance and minimization measures for power lines, the Department has determined that the proposed Project would not result in the destruction or adverse modification of federally designated critical habitat for the species.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" the piping plover. This determination is based on Keystone's construction plan to HDD the Platte, Loup, and Niobrara rivers, consultation with the USFWS, Keystone's commitment to follow recommended conservation measures identified by the USFWS, and power providers commitment to consult with and follow recommended conservation measures of the USFWS.

Although it is possible that a spill event could result in an adverse effect on this species, 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.

3.2.2 Western Prairie Fringed Orchid - Threatened

3.2.2.1 Natural History and Habitat Association

The western prairie fringed orchid (*Platanthera praeclara*) was listed as federally threatened on September 28, 1989 (54 FR 39857). 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 6 states (Iowa, Kansas, Minnesota, Missouri, Nebraska, and North Dakota) and Manitoba, Canada; and appears to be extirpated from Oklahoma (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 2012b). Tripp County

South Dakota has much potential habitat for the species (USFWS 2012b). 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 historic 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 historic 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 historic ranges of western prairie fringed orchid (Sieg and Bjugstad 1994), but it is unclear how fire or grazing may have affected the species (USGS 2006).

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 which may displace the western prairie fringed orchid through competition include: leafy spurge (*Euphorbia esula*), 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 2012b).

3.2.2.2 Potential Presence in Project Area

The western prairie fringed orchid is found 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 in South Dakota (USFWS 2012b). Known distribution of the species includes the counties of Holt, Antelope, and Boone in Nebraska (AECOM 2008a, NGPC 2011). 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 to assess habitat suitability and occurrence of the western prairie fringed orchid were completed in June 2009 and May through June 2011 and 2012 (Appendices B and C [NOTE: Listed and Special Status Survey Repts]). Surveys were conducted in suitable habitat in Tripp

County, South Dakota, and Holt, Greeley, and Wheeler counties in Nebraska in May and June 2009 and 2011. Surveys were conducted in suitable habitat in Holt, Antelope, and Boone counties in Nebraska along reroutes within that state in May and June 2012. One western prairie fringed orchid was located in 2009 at a wetland on the previous proposed Project route. Two plants were located at that same site in 2011. No western prairie fringed orchids were located along the proposed Project route in Nebraska in 2012 although suitable habitat was present in several areas, while other areas of potentially suitable habitat were not surveyed due to access denial. The western prairie fringed orchid will be assumed to be present if suitable habitat is present but access to survey for the species was denied.

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. The species can be impacted through disturbance to its habitat. This plant may also be impacted by alterations to the hydrology of sub-irrigated wetland habitat areas along the Platte River resulting from depletions to the Platte River system.

3.2.2.3 Impact Evaluation

Construction

Construction of the proposed pipeline could potentially disturb western prairie fringed orchid communities when vegetation is cleared and graded. Construction of permanent ancillary facilities also could displace plant communities for the lifetime of the proposed Project. Revegetation of the proposed pipeline ROW could introduce or expand invasive species, especially leafy spurge, Kentucky bluegrass, and Canada thistle into the Project area, potentially contributing to the decline of western prairie fringed orchid. Keystone has developed weed and vegetation monitoring plans to prevent the spread of invasive species as a consequence of the proposed Project construction and operation. These plans are discussed in Sections 2.13 and 4.16 of the CMRP (Appendix B), respectively, and would be updated prior to construction.

Impacts to the western prairie fringed orchid or suitable habitats for this plant from temporary water reductions during hydrostatic testing in the lower Platte River Basin would be avoided, based on Keystone's plan to withdraw the volume of water needed at a rate less than 10 percent of the baseline daily flow and to return water back to its source within a 30-day period and the small volume of water to be used in comparison to total basin water flow.

Operations

Operation of the proposed Project is not expected to result in impacts to the western prairie fringed orchid. Clearing of trees/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.

Direct contact with a crude oil spill could result in adverse toxicological effects to the western prairie fringed orchid. While these exposure routes have the potential to cause adverse effects, the probability of adverse effects to western prairie fringed orchid are unlikely due to the low probability of a spill, low probability of the spill coinciding with western prairie fringed orchid populations, and low probability of a spill reaching occupied habitats in sufficient amounts to

cause toxic effects (see Appendix G, Pipeline Risk Assessment and Environmental Consequence Analysis).

According to the Pipeline Temperature Effects Study (Appendix F), the pipeline does have some effect on surrounding soil temperatures, primarily at pipeline depth, in an area 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 impacted mainly by climate (such as air temperature and plant water availability) with negligible effect 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 impacts to vegetation. Therefore, there would be no effects of heat dissipation from the pipeline for the western prairie fringed orchid.

Power Lines and Substations

The construction of new electrical power line segments could impact the western prairie fringed orchid if power line ROWs were to disturb potential habitat for this species. Protection measures that could be implemented by electrical service providers to prevent impacts to this species would be the same as described below under Conservation Measures. Electrical power line providers would be responsible for obtaining the necessary approvals or authorizations from federal, state, and local governments. Keystone would advise electrical power providers of their ESA consultation requirement with the USFWS for the electrical infrastructure components constructed for the proposed Project to prevent impacts to the western prairie fringed orchid.

3.2.2.4 Cumulative Impacts

The spread of invasive plants could result in cumulative habitat impacts to federally protected plants, if present. Implementation of appropriate conservation measures as determined through consultations with federal and state agencies for federally protected and candidate species for the proposed Project would include impact avoidance, minimization, and habitat restoration and compensation to ameliorate long-term cumulative impacts. Proposed Project restoration includes restoration of native vegetation and soil conditions and prevention of spread and control of noxious weeds for 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. These conversions are not expected to adversely affect or contribute to cumulative impacts for any federally protected and candidate species.

3.2.2.5 Conservation Measures

Keystone commits to implementation of the following conservation measures for western prairie fringed orchid for areas where surveys have been done and where the species was found or where suitable habitat is present:

- Complete presence/absence surveys prior to construction within areas identified with potentially suitable habitat that were not previously surveyed. Submit survey results to the USFWS for review. If surveys cannot be conducted during the blooming period and suitable habitat is present, it will be assumed the species is present;

- Routing the pipeline around individual plants or populations within the proposed Project footprint;
- Transplanting individual plants that would be affected by construction activities to other locations where suitable habitat is available, when feasible and/or when approved by land owner if on private land;
- Reducing the width of the construction ROW in areas where plant species populations have been identified, to the extent possible;
- 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; and
- Restore wet meadow habitat using a seed mix approved by the USFWS and NGPC.
- Keystone would provide compensation for temporary construction and permanent operational impacts to the western prairie fringed orchid as part of a Trust. Compensation would be based on total acres impacted where western prairie fringed orchid presence was confirmed and in areas with suitable habitat that were not surveyed during the blooming period. Compensation would not be provided for habitat in areas where surveys were completed for western prairie fringed orchids and they were not found.
- Monitor restoration of construction-related impacts to wet meadow habitats identified as suitable for the western prairie fringed orchid consistent with USACE guidelines which indicate monitoring for a 5-year period for successful re-establishment of wetland vegetation.

3.2.2.6 Determination

Effect on Critical Habitat

Critical habitat has not been designated for this species. Therefore, the proposed Project would not result in the destruction or adverse modification to federally designated critical habitat for the western prairie fringed orchid.

Effect on Species

The proposed Project "may affect, but is not likely to adversely affect" the western prairie fringed orchid. This determination is based on the proposed Project route's proximity to the extant western prairie fringed orchid range, the presence of an identified and avoided population, the existence of suitable habitat within the proposed Project area, Keystone's commitment to implement avoidance and conservation measures that includes providing compensation for impacts to the western prairie fringed orchid where presence has been confirmed and where suitable habitat, as identified by the USFWS, has not been surveyed, and power providers will consult with the USFWS regarding ways to minimize or mitigate impacts to the western prairie fringed orchid and other threatened and endangered species affected by construction and follow recommended avoidance and conservation measures of the USFWS.

3.3 FEDERAL CANDIDATE SPECIES

3.3.1 Greater Sage-Grouse– Candidate

3.3.1.1 Natural History and Habitat Association

The greater sage-grouse (*Centrocercus urophasianus*) was identified as a candidate species under the Endangered Species Act of 1973, as amended on March 5, 2010 (75 FR 13910) and accordingly is not at present provided federal protection under the ESA. For purposes of the proposed Project, the greater sage-grouse has been analyzed because it is a federal candidate species. As a federal candidate species, the greater sage-grouse is a species in decline that the USFWS believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities.

Greater sage-grouse is a BLM sensitive species, a Montana species of concern, and a South Dakota species of greatest conservation need. Critical habitat has not been identified for greater sage-grouse but they are considered a sagebrush obligate species (Braun et al. 2001). Core habitat has been designated in Montana. Greater sage-grouse are the largest grouse species in North America; the wingspan of a male greater sage-grouse can be up to 97 cm with a weight of up to 3.2 kg (Montana Field Guide 2012a). The greater sage-grouse is a large, rounded-winged, ground-dwelling bird, up to 30 inches long and two feet tall, weighing from two to seven pounds. It has a long, pointed tail with legs feathered to the base of the toes. The birds are found at elevations ranging from 4,000 to over 9,000 feet and are highly dependent on sagebrush for cover and food. Evidence suggests that habitat fragmentation and destruction across much of the species range has contributed to significant population declines over the past century.

Greater sage-grouse commonly use multiple habitats throughout the year (Braun et al. 2001, Connelly et al. 2004). Greater sage-grouse are lekking birds; males gather and perform mating displays for females at leks. After mating, females nest, on average, between approximately 2 to 4 miles and up to approximately 12 miles from the lek site. Important components of lek sites include relatively open habitats with minimal sagebrush. Nesting habitat includes moderate amounts of sagebrush cover (about 23 percent) with varying heights, residual grass cover, and live forb cover. Brood-rearing habitat is defined as either early or late-season brooding habitat. Early-season habitat is comprised of relatively open stands of sagebrush and high herbaceous cover while late-season habitat is comprised of riparian meadows or hay ground that supports succulent herbaceous vegetation and has a surrounding buffer of sagebrush. Winter habitat is comprised of areas where sagebrush extends 25 to 35 cm above the snow or where sagebrush is blown free of snow by wind (Braun et al. 2001).

Greater sage-grouse have historically occupied sagebrush habitats in 13 states throughout the western United States, including Washington, Oregon, California, Nevada, Utah, Idaho, Montana, North Dakota, South Dakota, Wyoming, Colorado, Arizona, and New Mexico (Wallestad 1975). Today greater sage-grouse still occupy reduced ranges within most of these states, but have apparently been extirpated from Arizona and New Mexico (USFWS 2012c). Greater sage-grouse population decline has been a concern for over 90 years and was first expressed by Hornaday in 1916 (Hornaday 1916).

More recently, greater sage-grouse population data were analyzed and results showed a decline of 17 to 47 percent in breeding populations within nine western states and one Canadian province;

greater sage-grouse populations were classified as secure in five states, with populations in six states and two provinces classified as at risk (Connelly and Braun 1997). Declines in greater sage-grouse populations appear to be less from 1986 to 2003 (0.4 percent annual decline) than from 1965 to 1985 (2.0 percent annual decline) (Connelly et al. 2004), but the overall trend in greater sage-grouse populations has continued downward until the present (Garton et al. 2011). Specific to the proposed Project area, active greater sage-grouse leks in northern Montana, north of the Missouri River, are estimated to have declined by 22 percent from 1965 to 2007; active greater sage-grouse leks in southeastern Montana have declined by 27 percent from 1970 to 2007; and active greater sage-grouse leks in the Dakotas have declined by 20 percent from 1965 to 2007 (Garton et al. 2011).

Declines in greater sage-grouse populations have been attributed primarily to the loss of sagebrush habitat from agriculture, altered fire regimes, cheatgrass (*Bromus tectorum*) invasion, and more recently, energy development, primarily oil and gas development and wind farm development (Doherty et al. 2011, Johnson et al. 2011).

3.3.1.2 Potential Presence in Project Area

Greater sage-grouse are known to inhabit sagebrush habitats in the proposed Project area between the Canada/Montana border and northwestern South Dakota. Greater sage-grouse can occur throughout central and eastern Montana in suitable sagebrush habitats year-round, and are known from Beaverhead, Big Hom, Blaine, Carbon, Carter, Chouteau, Custer, Dawson, Fallon, Fergus, Gallatin, Garfield, Golden Valley, Hill, Liberty, Madison, McCone, Meagher, Musselshell, Petroleum, Phillips, Powder River, Prairie, Richland, Rosebud, Silver Bow, Stillwater, Sweet Grass, Treasure, Valley, Wheatland, Wibaux, and Yellowstone counties. Greater sage-grouse are found in Butte, Fall River, and Harding counties, South Dakota (USFWS 2012b).

Since issuance of the August 2011 Final EIS, the BLM issued, through Instruction Memorandum No. 2012-043, *Greater Sage-Grouse Interim Management Policies and Procedures* (Interim Policy) in order to maintain or promote sustainable greater sage-grouse populations and conservation of its habitat (BLM 2011). The Interim Policy identifies policies and procedures to minimize habitat loss in Preliminary Priority Habitat (PPH) and Preliminary General Habitat (PGH) areas. PPH in Montana are the MFWP delineated core areas, which are the highest conservation value habitats, as determined by coordination between BLM and MFWP. The BLM is coordinating with the respective state wildlife agency in Montana and with SDGFP in accordance with the Interim Policy, although federal lands are not involved with the proposed Project in South Dakota. Several BLM PPHs exist in Harding County, South Dakota. The proposed Project crosses PPH within one area of South Dakota, on private lands which are not applicable to the Interim Policy.

Greater sage-grouse management is the responsibility of MFWP in Montana and the responsibility of SDGFP in South Dakota. In addition, the *Management Plan and Conservation Strategies for Sage-Grouse in Montana* includes information on the identification of important seasonal habitats and recommended management practices to avoid impacts (Montana Sage Grouse Work Group 2005).

Surveys for this species have been carried out and Keystone, in consultation with USFWS South Dakota Ecological Services Field Office and SDGFP, has prepared a draft supplemental mitigation plan for the greater sage-grouse that is currently under review. Keystone has completed

surveys within a 4-mile radius of the proposed Project components to locate greater sage-grouse leks, or monitor known leks, since 2010 (Appendix L, Summary of April 2010 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment). The 4-mile radius used for locating greater sage-grouse leks was developed based on agency recommendations and includes a survey buffer to accommodate future route modifications. In 2011, Keystone monitored 46 lek sites within Montana and South Dakota; displaying male greater sage-grouse were observed at 35 lek sites (WESTECH 2011a) (Appendix M, Summary of April 2011 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment). In 2012, displaying males were observed at 18 of the same leks (Appendix N, 2012 Aerial Searches for Grouse Leks). In total, the MFWP and SDGFP consider 28 of these leks to be active in any given year.

3.3.1.3 Impact Evaluation

Construction

Greater sage-grouse would be especially vulnerable to pipeline construction activities in spring when birds are concentrated on strutting grounds (leks) and where the proposed Project pipeline and access roads would be constructed through sagebrush communities with leks and nesting sage-grouse. An estimated 35 recently active lek sites within 4 miles of the proposed Project could potentially be occupied by sage-grouse (WESTECH 2012) during construction. Construction near active leks could displace breeding birds from leks or disturb nests, resulting in a decrease in their reproduction. Traffic on roads near active leks could cause vehicle collision and greater sage-grouse may not survive.

Construction would increase noise levels in the vicinity of the project activities (see the Supplemental EIS, Section 4.12.3.3, Noise Construction Impacts). Construction noise levels are rarely steady in nature, but instead fluctuate depending on the number and type of equipment in use at any given time. There would be times when no large equipment is operating and noise would be at or near ambient levels. In addition, construction-related sound levels would vary by distance. Recent studies suggest that greater sage-grouse avoid leks with anthropogenic noise and that intermittent noise may have a greater effect than continuous noise (Blickley et al. 2012) and that low frequency noise could affect mate assessment for lekking greater sage-grouse (Blickley and Patricelli 2012).

Courtship and breeding behavior disruption could be minimized by scheduling construction after birds have left the leks (usually by mid-May). Mortality to greater sage-grouse and loss of nests, eggs, and young could be avoided by scheduling construction through occupied sagebrush steppe habitats after young sage-grouse have become mobile and are able to fly (usually by mid-August). Greater sage-grouse chicks are precocious and are capable of leaving the nest shortly after hatching, but they may not be sufficiently mobile to avoid construction related impacts until after they can fly.

After construction, re-establishment of sagebrush to pre-disturbance cover levels on the ROW may take many years depending on the type of sagebrush, subsequent soil moisture, and extent of competition from invasive annual plants or perennial grasses. During this period, vegetation on reclaimed areas would likely be dominated by grasses with low shrub densities. The cleared ROW and the three new permanent access roads in Montana and one new permanent access road in South Dakota may encourage recreational use of the ROW. Recreational use (e.g., motorized

vehicles, wildlife viewing) of the area during the breeding season could have an adverse effect on sage-grouse reproduction.

Three new permanent access roads in Montana and one new permanent access road in South Dakota would be constructed. One new access road in Montana is within 4 miles of a confirmed active greater sage-grouse lek. The new access road in South Dakota is within 4 miles of a lek located in Montana where greater sage-grouse were observed in 2010, 2011, and 2012. However, none of these roads would be visible from the leks.

Three of the six proposed pump stations in Montana (PS-10, PS-11, and PS-14) would be constructed within 4 miles of confirmed active leks. PS-10 is approximately 3.4 miles from Lek 744 and is not visible from the lek. PS-11 is approximately 2.9 miles from Lek 619, a confirmed active lek in the agency database but one which has not been surveyed by agencies since 1996 and where Keystone has not observed greater sage-grouse for 3 consecutive years. PS-11 is also within 3.7 miles of Lek 1738, a lek of unconfirmed activity status where Keystone has not observed greater sage-grouse in 3 consecutive years. The pump station is not visible from either of these lek sites.

PS-14 is approximately 2.7 miles from confirmed active leks 1805 and 1430, but is not visible from either lek. PS-14 is also within 2.4 miles of Lek 1725 which has unconfirmed activity. Keystone surveys have not observed any greater sage-grouse at Lek 1725 for 3 consecutive years. Agency surveys at the lek did not observe greater sage-grouse in 2011.

One new pump station in South Dakota (PS-15) would be constructed within 3.2 miles of Lek 1437, a confirmed active lek in Montana. The pump station is not visible from Lek 1437 because of terrain. A second pump station in South Dakota (PS-16) would be constructed within 1.3 miles of the active Squaw Creek Lek.

Pipe yard 12 in South Dakota is 1 mile away from the KXL-195 Hoover lek where greater sage-grouse have been observed for 3 consecutive years. This pipe yard is dominated by grasses and is not high-quality greater sage-grouse habitat. Pipe yards are cleared of vegetation and are used to store and retrieve pipes for pipeline construction.

Operations

Noise from the pump stations would attenuate to background levels within 0.5 miles from the proposed pump stations and would not be expected to cause disturbance to greater sage-grouse leks because no recently active leks were identified within 0.5 mile of proposed pump stations in Montana or South Dakota (i.e., all pump stations are greater than 0.5 mile from the nearest lek). Communication towers associated with the proposed pump stations could lead to increased collision hazard and increased predation by raptors by providing vantage perches.

Human activity at the pump stations would be relatively minor and not above normal background levels at any pump station that is within 2 miles of an active lek. The only lek that is within 2 miles of a pump station is the Squaw Creek Lek, which is adjacent to a gravel county road that currently receives occasional daily traffic. Overflights by aircraft could disrupt greater sage-grouse that are at leks in the early morning or possibly evening. Typically overflights are scheduled at least one hour after sunrise, a time when lek activity would be naturally decreasing.

Power Lines and Substations

The construction of electrical distribution lines to pump stations in Montana and South Dakota would incrementally increase habitat alteration and predation hazards for feeding and nesting greater sage-grouse in the proposed Project area. Construction of these distribution lines during the breeding season could also potentially disturb breeding, nesting, and brood-rearing birds. Power lines across native grassland habitats may contribute to fragmentation. Keystone would not construct or operate these electrical distribution lines, but would inform electrical power providers of the candidate status of the greater sage-grouse, and would encourage consultations with Montana and South Dakota regulatory agencies for the electrical infrastructure components constructed for the proposed Project, to prevent impacts to greater sage-grouse.

3.3.1.4 Cumulative Impacts

Short, medium or long-term loss or alteration of native grassland and sagebrush habitats through the spread of invasive plants in Montana and South Dakota from previous projects in addition to similar impacts from the proposed Project could contribute to cumulative habitat impacts for federal candidate birds, including the greater sage-grouse.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could provide perches on towers and poles that could increase the cumulative predation mortality for ground nesting birds, including the greater sage-grouse (although not a migratory bird), interior least tern, piping plover, and Sprague's pipit. The Bakken Marketlink facilities would be constructed near known greater sage-grouse lekking sites, and, therefore, construction could affect greater sage-grouse or their habitat. The proposed alternative corridors for the Big Bend to Witten 230-kV transmission line in southern South Dakota are generally outside of the range of breeding greater sage-grouse (USFWS 2010), and construction of a transmission line would be unlikely to affect the greater sage-grouse.

3.3.1.5 Conservation Measures

USFWS recommends that pre-construction surveys for greater sage-grouse suitable habitat and leks be completed along the pipeline route. The Department has been in consultation with the USFWS, BLM, MFWP, and the SDGFP to consider the effects of the proposed Project on this species including conservation measures, habitat fragmentation, potential avoidance, minimization, and conservation measures. Conservation measures would be implemented by Keystone to avoid, minimize, and compensate for impacts to the sage-grouse. Many of these measures were described in *An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse* (Appendix O) and *An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse in South Dakota; and Associated Correspondences* (Appendix P). In South Dakota, this strategy was supplemented with compensatory mitigation that was outlined in a proposal submitted to SDGFP in November 2011 and revised in November 2012 (Appendix P). Those measures, as well as measures that were identified in the Final EIS, include the following:

- Conduct surveys of greater sage-grouse leks prior to construction using approved methods to determine lek locations and peak number of males in attendance within 3 miles of the facility

unless the facility is screened by topography; also survey leks identified by MFWP, BLM, and SDGFP more than 3 miles from the facility for use as a baseline to determine construction effects on sage-grouse abundance.

- Develop a conservation plan with MFWP, SDGFP, USFWS, and BLM to address impacts to greater sage-grouse, including construction timing restrictions, habitat enhancement, and any mitigation measures that would be necessary to maintain the integrity of Core Areas or Preliminary Priority Habitat/Protection Priority Areas (USFWS 2012b), which encompasses lek habitats as well as other important habitat necessary for greater sage-grouse to meet life requisites (see Appendices O and P, Sage Grouse Mitigation Plans).
- Follow all protection and mitigation efforts as identified by USFWS and SDGFP including identify all greater sage-grouse leks within the buffer distances from the construction ROW set forth for the greater sage-grouse by USFWS, avoid or restrict construction activities as specified by USFWS within buffer zones between March 1 and June 15 (see Appendices O and P, Sage Grouse Mitigation Plans.
- Construction within 3 miles of active greater sage-grouse leks in suitable nesting habitat not screened by topography would be prohibited during March 1 to June 15, with an allowance for one-time equipment movement during mid-day hours through ROW areas with timing restriction that do not require grading for equipment passage to lessen disturbance to sage-grouse leks.
- Construction within 2 miles of active greater sage-grouse leks on federal land would be prohibited during March 1 to June 15.
- Reduce the mound left over the trench in areas where settling would not present a path for funneling runoff down slopes in sagebrush habitat, additional measures would be taken to compact backfilled spoils to reduce settling.
- Establish a compensatory mitigation fund for use by MDEQ, MFWP, and BLM to enhance and preserve sagebrush communities for greater sage-grouse and other sagebrush-obligate species in eastern Montana (size of the fund to be based on acreage of silver sagebrush and Wyoming big sagebrush habitat disturbed during pipeline construction within sage-grouse core habitat mapped by MFWP and important habitat between approximate Mileposts 95 to 98 and 100 to 121.
- Limit inspection over-flights to afternoons from March 1 to June 15 during operations as practicable in sagebrush habitat designated by MFWP.
- Fund a 4-year study, under the direction of MDEQ, MFWP, and BLM, that would show whether the presence of the facility has affected greater sage-grouse numbers based on the peak number of male sage-grouse in attendance at leks.
- Implement restoration measures (i.e., 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.

- Prior to construction, conduct studies along the route to identify areas that support stands of silver sagebrush and big sagebrush and incorporate these data into restoration activities to prioritize reestablishment of sagebrush communities.
- Monitor and report on establishment of sagebrush on reclaimed areas, unless otherwise requested by the landowner, annually for at least 4 years to ensure that sagebrush plants become established at densities similar to densities in adjacent sagebrush communities and implement additional sagebrush seeding or planting if necessary.
- Establish criteria in conjunction with MDEQ, MFWP, and BLM to determine when restoration of sagebrush communities has been successful based on pre- and post-construction studies in addition to revegetation standards.
- Use locally adapted sagebrush seed, collected within 100 miles of the areas to be reclaimed, unless otherwise requested by the affected landowner (seed would be collected as close to the Project as practicable as determined by regional seed production and availability).
- Monitor cover and densities of native forbs and perennial grasses exclusive of noxious weeds on reclaimed areas and reseed with native forbs and grasses where densities are not comparable to adjacent communities.
- Work in conjunction with the landowner to appropriately manage livestock grazing of reclaimed areas until successful restoration of sagebrush communities has been achieved (livestock grazing in restored sagebrush communities may promote establishment of sagebrush).
- 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 plants do not exist in undisturbed areas adjacent to the ROW (noxious weed management plans would be developed and reviewed by appropriate county weed specialists and land management agencies for each state crossed by the proposed Project).
- Establish a compensatory mitigation fund for temporary and permanent impacts to greater sage-grouse habitat for use by SDGFP to enhance and preserve sagebrush communities within the sagebrush ecosystem in South Dakota, which is found within the following counties: Butte, Custer, Fall River, and Harding counties and to a lesser degree, Perkins and Meade counties.
- Develop a research fund, in consultation with SDGFP, and managed by a third party to evaluate the effects of pipeline construction on greater sage-grouse.
- Monitor leks that are within 3 miles of the project footprint in South Dakota that are within the viewshed of the construction ROW if construction takes place between March 1 and June 15.
- Implement, in consultation with SDGFP, a modified 3-mile buffer between March 1 to June 15 around active greater sage-grouse leks. The buffer would be modified on a lek-by-lek basis to account for differences in topography, habitat, existing land uses, proximity of the Project to the lek, and line-of-sight between the proposed Project and each lek.
- Restrict construction equipment activity in South Dakota to occur only between 10 am and 2 pm to avoid impacts to breeding greater sage-grouse from March 1 through June 15 in areas

where a lek is either within 3 miles of the ROW and visible from the ROW; or within 1 mile of the ROW.

3.3.1.6 Determination

Effect on Critical Habitat

The proposed Project would not result in the destruction or adverse modification of federally designated critical habitat for greater sage-grouse as none has been identified for the species.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" greater sage-grouse. This determination is based on Keystone's commitment to follow recommended conservation measures identified by the USFWS and state agencies, and Keystone's commitment to implement avoidance and conservation measures including providing compensation for impacts to greater sage-grouse habitat in Montana and South Dakota. As a result, no direct impacts are expected to result from construction. Indirect impacts from disturbance to sage-grouse during proposed Project construction and operation are expected to be short-term, temporary, or minimal.

Although it is possible that a large spill event could result in an adverse effect on this species and its habitat, the probability of adverse effects to sage-grouse are unlikely due to the low probability of a spill, low probability of the spill coinciding with important sage-grouse habitats, and low probability of a sage-grouse contacting the spilled product.

3.3.2 Sprague's Pipit - Candidate

3.3.2.1 Natural History and Habitat Association

Sprague's pipit (*Anthus spragueii*) was identified as a candidate species under the Endangered Species Act of 1973, as amended on September 15, 2010 (75 FR 56028), and accordingly is not at present provided federal protection under the ESA. However, Sprague's pipit is a migratory bird that is protected under the MBTA. For purposes of the proposed Project, Sprague's pipit has been analyzed because it is a federal candidate species. As a federal candidate species, Sprague's pipit is a species in decline that the USFWS believes needs to be listed as threatened or endangered, but listing is currently precluded by other priorities.

Sprague's pipit is a small, grassland-dwelling, migratory songbird (USFWS 2012b). Adults reach a length of approximately 16.5 cm with a wingspan of approximately 25.4 cm. Sprague's pipits are extremely secretive on the ground and are often identified by their song which is a "high-pitched, thin 'jingling' sound" (Montana Field Guide 2012b). Sprague's pipit is an endemic species to grasslands preferring areas with medium to intermediate height vegetation; the species is more abundant in native prairie than in areas that have been seeded with, or invaded by, introduced grasses (Casey 2000, Dechant et al. 2003). Sprague's pipit requires relatively large areas of undisturbed habitat, with a potentially minimum area requirement of 190 hectares (Dechant et al. 2003). In addition to native grasslands, Sprague's pipits have been recorded in alkaline meadows and the edges of alkaline lakes (Johnsgard 1986).

Sprague's pipits breed throughout the northern Great Plains with their highest numbers in the native mixed-grass prairie of north-central, and eastern Montana, to North Dakota and northwestern and north-central South Dakota (Jones 2010). Migration occurs through the central

Great Plains in April and May and late September through early November (Jones 2010). Sprague's pipits are ground nesters in medium height, primarily native vegetation; nesting occurs between May and August (Jones 2010).

As of 2010 an estimated 870,000 Sprague's pipits were in North America, with populations declining approximately 3 percent per year since 1980 in the United States (Jones 2010). The species decline is primarily attributable to agriculture and subsequent habitat loss, degradation, and fragmentation through conversion to seeded pasture, hayfields, and croplands, as well as overgazing by livestock (Jones 2010). Sprague's pipits are also threatened by habitat loss and degradation from overgrazing, mowing, and reduced fire frequency; energy development; introduced and invasive plants; and drought (Jones 2010).

3.3.2.2 Potential Presence in Project Area

Sprague's pipits are known to occur in the Project area based on relative density and recent observations contained in the Montana Field Guide (2012b). Data indicate that the highest likelihood of Sprague's pipit within the proposed Project area is in native grasslands north of the Missouri River (Montana Field Guide 2012b), although the species is also known to occur in native grasslands in eastern Montana and northwestern South Dakota.

Specifically, breeding habitat for Sprague's pipits occurs in the 44.2 miles of the North Valley Grasslands Important Bird Area (IBA) which is crossed by the proposed Project. Sprague's pipit is relatively common in this area and exceed the globally significant threshold of this IBA (Montana Audubon 2012). Sprague's pipits also breed in flat to gently-rolling prairie areas in other eastern Montana counties that would be crossed by the proposed Project. Outside the habitat north of the Missouri River, the proposed Project would cross approximately 87 miles of native, mixed grass prairie that could serve as suitable habitat depending on grazing regimes and adjacent human activity.

In South Dakota Sprague's pipits are a rare summer resident in central and northwestern South Dakota within native prairie grasslands (Jones 2010). The proposed Project would cross approximately 119 miles of native, mixed grass prairie that could serve as suitable habitat depending on grazing regimes and adjacent human activity. Sprague's pipits are uncommon seasonal migrants in Nebraska (Jones 2010). Sprague's pipits were recorded as abundant during early European exploration. Currently, they are common only in remnant large grassland patches in the northern mixed-grass native prairie of North America. The decline of Sprague's pipits occurred as the short- and mixed-grass prairies were converted to agriculture.

Sprague's pipits are short-distance migratory birds, moving from breeding grounds in the central and western plains of the northern United States and southern Canada southward to the wintering grounds in the central grasslands of northern Mexico and the southern United States. Sprague's pipits are passerine birds about 14 cm in length. The wings and tail are dark brown with two pale indistinct wing-bars, the crown, nape, and upper parts are buffy with blackish streaking and the face is buffy with a pale eye-ring creating a large-eyed appearance. In South Dakota, they can be found in the following counties: Butte, Campbell, Corson, Custer, Dewey, Fall River, Haakon, Harding, Jackson, Jones, Lawrence, Lyman, McPherson, Meade, Pennington, Perkins, Shannon, Stanley, and Ziebach.

Sprague's pipits can occur throughout central and eastern Montana in suitable grassland habitats during nesting and migration seasons, and are known from Big Horn, Blaine,

Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Judith Basin, Lewis and Clark, Liberty, Madison, McCone, Meagher, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Richland, Roosevelt, Rosebud, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, and Yellowstone counties. The species has been confirmed in central Nebraska as it migrates through the state using grassland and wetland habitats.

Preconstruction surveys for suitable nesting habitat for the Sprague's Pipit would be completed along the proposed Project route.

3.3.2.3 Impact Evaluation

Construction

In Montana, data indicate that the highest likelihood of Sprague's pipit along the proposed Project route is in native grasslands north of the Missouri River (MNHP and MFWP 2012a). High quality breeding habitat for Sprague's pipits occurs in the 44.2 miles of the North Valley Grasslands Important Bird Area (IBA) which is crossed by the proposed Project route in the Glaciated Plains in northern Montana, where this species is relatively common. Outside of the habitat north of the Missouri River, the proposed Project route would cross approximately 87 miles of native, mixed grass prairie that could serve as suitable habitat for this species, depending on grazing regimes and adjacent human activity. In South Dakota, the proposed Project route would cross approximately 119 miles of native, mixed grass prairie that could serve as suitable habitat depending on grazing regimes and adjacent human activity. In Nebraska, Sprague's pipits are uncommon seasonal migrants (Jones 2010).

Construction through native prairie habitats could affect nesting Sprague's pipit if they are present and if construction occurs during the nesting season. Nests, eggs, and young could be lost during construction. Disturbance could lead to nest abandonment resulting in loss of eggs or young. Construction would also create temporarily unsuitable habitat for the species until revegetation is successful at establishing medium height, native grassland cover.

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 Sprague's pipit. Overflights would be at an elevation that should not negatively affect the species.

Power Lines and Substations

Electrical transmission lines associated with the proposed Project would slightly increase risk of collision for Sprague's pipit and increase the possibility of predation since the transmission line towers would provide perches for avian predators. The transmission line to proposed PS-10 would cross about 19 miles of the North Valley Grasslands IBA and about 2 miles of the Charles M. Russell National Wildlife Refuge IBA, both of these areas support breeding Sprague's pipit. Construction during the breeding season could potentially disturb nesting and brood-rearing birds.

Power transmission lines may also increase the likelihood of collisions for Sprague's pipits since they typically have high, ringing flights during the spring and summer (Peterson 1980). Keystone would not construct or operate these electrical distribution lines, but would inform electrical

power providers of the requirements for ESA consultations with the USFWS for the electrical infrastructure components constructed for the proposed Project to prevent impacts to nesting Sprague's pipit.

Cumulative Impacts

Short, medium, or long-term loss or alteration of native grassland and sagebrush habitats through the spread of invasive plants in Montana and South Dakota from previous projects in addition to similar impacts from the proposed Project could contribute to cumulative habitat impacts for federal candidate birds, including Sprague's pipit.

The proposed Project could potentially affect four federally protect or candidate migratory birds (whooping crane, piping plover, interior least tern, and Sprague's pipit) within their migration range from Nebraska to Montana and/or within their breeding habitats. Conservation measures proposed for three of these birds (i.e., whooping crane, piping plover, and interior least tern) include protection of river and riparian nesting and migration staging habitats through use of HDD crossing methods and site-specific surveys to avoid disturbance to migration staging, nesting, and brood-rearing individuals. Habitat and disturbance impacts at major river crossings from future linear projects would likely incorporate similar conservation measures to avoid and minimize effects to these birds.

Future electrical power transmission lines and the distribution lines that would serve pump stations and MLVs of the proposed Project or any other future projects could incrementally increase the collision hazard for the four federally protected or candidate migratory birds. Cumulative collision mortality effects would be most detrimental to the whooping crane, interior least tern, and piping plover; perches provided by towers and poles could increase the cumulative predation mortality for ground nesting birds, including Sprague's pipit.

Impacts to federally protected and candidate species from the construction and operation of the connected actions (Bakken Marketlink Project, Big Bend to Witten 230-kV Transmission Line, and Electrical Distribution Lines and Substations) would be long term or permanent. The greater sage-grouse, Sprague's pipit, and federally protected species may be impacted by habitat loss resulting from construction of the Bakken Marketlink Project, along with future projects in the area that reduce and fragment preferred habitat for these species. However, habitat loss would be mitigated and any additional potential habitat loss would likely require similar conservation methods and mitigations, thus reducing overall cumulative impacts on these species.

The transmission line, electrical distribution lines, and substations could result in long-term increased bird collisions, bird predation, and habitat loss. However, with implementation of conservation measures, it is not expected that these lines would have cumulative impacts on birds protected under the MBTA or Bald and Golden Eagle Protection Act.

3.3.2.4 Conservation Measures

Conservation measures have been discussed with multiple agencies and would be implemented to avoid, minimize, and compensate for impacts to the Sprague's pipit.

The Final EIS identified several measures to reduce impacts to Sprague's pipit as outlined below:

- Seed disturbance areas in native range with a native seed mix after topsoil replacement.

- Monitor the ROW to determine the success of revegetation after the first growing season, and for areas in which vegetation has not been successfully reestablished, reseed the area.
- 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.
- Develop a Migratory Bird Conservation Plan for the proposed Project to comply with the Migratory Bird Treaty Act and implement provisions of Executive Order 13186 by providing benefits to migratory birds and their habitats within the states where the proposed Project would be constructed, operated, and maintained.
- If construction would occur during the April 15 to July 15 grassland ground-nesting bird nesting season, nest-drag surveys should be completed to determine the presence or absence of nests on federal land in eastern Montana.
- Delay construction activity from April 15 to July 15 within 330 feet of discovered active nests in eastern Montana (MDEQ and MFWP).

3.3.2.5 Determination

Effect on Critical Habitat

The proposed Project would not result in the destruction or adverse modification of federally designated critical habitat for Sprague's pipit as none has been identified for the species.

Effect on the Species

The proposed Project "may affect, but is not likely to adversely affect" Sprague's pipit. This determination is based on Keystone's commitment to follow recommended conservation measures identified by the USFWS, and to implement avoidance and conservation measures. As a result, no direct impacts are expected to result from construction. Indirect impacts from disturbance to Sprague's pipit during proposed Project construction and operation would be disturbance of nesting or mating behavior or from an inadvertent spill.

Although it is possible that a large spill event could result in an adverse effect on this species and its habitat, the probability of adverse effects to Sprague's pipit are unlikely due to the low probability of a spill, low probability of the spill coinciding with important Sprague's pipit habitats, and low probability of a Sprague's pipit contacting the spilled product.

4.0 BACKGROUND

AECOM. 2008a. Personal communication between C. Bessken (USFWS) and P. Lorenz (AECOM). June 11, 2008.

_____. 2008b. TransCanada Keystone XL Project - USFWS/MFWP Meeting Notes. Helena, Montana. May 8, 2008.

_____. 2008c. TransCanada Keystone XL Project - USFWS/SDGFP Meeting Notes. Lincoln, Nebraska. May 5, 2008.

_____. 2008d. TransCanada Keystone XL Project - USFWS/SDGFP Meeting Notes. Pierre, South Dakota. June 10, 2008.

_____. 2008e. Personal communication between D. Backlund (SDGFP) and P. Lorenz (AECOM). July 9, 2008.

_____. 2009a. 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. Personal communication between A. Dood (MFWP) and P. Lorenz (AECOM). March 12 and 13, 2009.

_____. 2009e. Personal communication between O. Bocanegra (USFWS) and D. Endriss (AECOM). April 28, 2009.

_____. 2009f. TransCanada Keystone XL Project - USFWS/MFWP Meeting Summary. Glasgow, Montana. February 3, 2009.

_____. 2009g. Personal communication between L. Hanebury (USFWS) and P. Lorenz (AECOM). April 16, 2009.

APLIC. See Avian Power Line Interaction Committee.

Armbruster, M. J. 1990. Characterization of habitat used by whooping cranes during migration. Biological Report 90(4):1-16.

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.

Atkinson, S.J. and A.R. Dood. 2006. Montana Piping Plover Management Plan. Montana Department of Fish, Wildlife, and Parks. Bozeman, Montana. 78 pp.

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. 157 pp. Website: http://www.npwrc.usgs.gov/resource/birds/wcdata/index.htm. (Version 01JUL03). Accessed: December 10, 2012

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.

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. Washington, D.C.

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.

Blickley, J.L., and G.L. Patricelli. 2012. Potential acoustic masking of greater sage-grouse (*Centrocercus urophasianus*) display components by chronic industrial noise. Ornithological Monographs No. 74:23-35.

Blickley, J.L., D. Blackwood, and G.L Patricelli. 2012. Experimental evidence for the effects of chronic anthropogenic noise on abundance of greater sage-grouse at leks. Conservation Biology 26(3):461-471.

Braun, C.E., J.W. Connelly, and M. A. Schroeder. 2001. Seasonal habitat requirements for sage-grouse: spring, summer, fall, and winter. In: Sage-grouse habitat restoration symposium proceedings. June 4-7, 2001, Boise, Idaho. Proc. RMRS-P-38. Fort Collins, Colorado: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 130 pp.

Campbell, L. 2003. Endangered and Threatened Animals of Texas: Their Life History and Management. Website: http://www.tpwd.state.tx.us/huntwild/wild/species/endang/index.phtml. Accessed December 10, 2012.

Canadian Wildlife Service and U.S. Fish and Wildlife Service (CWS and USFWS). 2005. Draft International Recovery Plan for the Whooping Crane. Ottawa: RENEW and USFWS, Albuquerque, New Mexico. 196 pp.

_____. 2007. International recovery plan for the whooping crane. Ottawa: Recovery of Nationally Endangered Wildlife (RENEW), and USFWS, Albuquerque, New Mexico. 162 pp.

Casey, D. 2000. Partners in Flight Draft Bird Conservation Plan Montana. 281 pp.

Connelly, J.W., and C.E. Braun. 1997. Long-term changes in sage-grouse (*Centrocercus urophasianus)* populations in western North America. Wildlife Biology 3:229-234.

Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Unpublished report. Western Association of Fish and Wildlife Agencies. Cheyenne, Wyoming.

Cowie, R.H., and D.G. Robinson. 2003. Pathways of introduction of non-indigenous land and freshwater snails and slugs. Pp. 93–122 in Invasive Species: Vectors and Management Strategies. G. M. Ruiz and J. T. Carlton (eds.). Island Press, Washington, DC.

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(3):275-306.

CWS and USFWS. See Canadian Wildlife Service and U.S. Fish and Wildlife Service.

Dechant, J.A., M.L. Sondreal, D.H. Johnson, L.D. Igl, C.M. Goldade, M.P. Nenneman, and B.R. Euliss. 2003. Effects of management practices on grassland birds: Sprague's Pipit. Northern Prairie Wildlife Research Center, Jamestown, North Dakota. Northern Prairie Wildlife Research Center Online. Website: http://www.npwrc.usgs.gov/resource/literatr/grasbird/sppi/sppi.htm (Version May 28, 2004). Accessed: December 10, 2012

Doherty, K.E., D.E. Naugle, H.E. Copeland, A. Pocewicz, and J.M. Kiesecker. 2011. Energy development and conservation tradeoffs: systematic planning for greater sage-grouse in their eastern range. In: Greater Sage-Grouse Ecology and Conservation of a Landscape Species and Its Habitat. S.T. Knick and J.W. Connelly Eds. Studies in Avian Biology, A Publication of the Cooper Ornithological Society. University of California Press. 646 pp.

ENSR Corporation (ENSR). 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. Prepared for Keystone Pipeline Project by ENSR Corporation.

Eggert, A., and S.K. Sakaluk. 2000. Benefits of communal breeding in burying beetles: a field experiment. Ecological Entomology 25: 262-266.

exp Energy Services Inc. 2012. TransCanada Keystone XL Pipeline Project: Environmental Report. September 7, 2012.

Federal Register. 1967. Endangered Species - 1967. Federal Register 32(48):4001.

_____. 1970. Conservation of Endangered Species and Other Fish or Wildlife. Federal Register 43(106):8491-8498.

_____. 1978. Determination of Critical Habitat for the Whooping Crane. Federal Register 43(94):20938-20942.

_____. 1985. Endangered and Threatened Wildlife and Plants; Interior Population of Least Tern to be Endangered. Final Rule. Federal Register 50(102):21784-21792.

_____. 1985. Endangered and Threatened Wildlife and Plants; Determination of Endangered and Threatened Status for Piping Plover. Final Rule. Federal Register 50:50726-50734.

_____. 1989. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the American Burying Beetle. Final Rule. Federal Register 54(133):29652-29655.

_____. 1989. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for Eastern and Western Prairie Fringed Orchids. Final Rule. Federal Register 54(187):39857-39863.

_____. 1990. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status of Pallid Sturgeon. Final Rule. Federal Register 55(173):36641-36647.

_____. 2001. Endangered and Threatened Wildlife and Plants; Final Determinations of Critical Habitat for Wintering Piping Plovers. July 10, 2001. Final Rule. Federal Register 66(132):36038-36086.

_____. 2002. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Great Plains Breeding Population of the Piping Plover. September 11, 2002. Final Rule. Federal Register 67(176):57638-57717.

_____. 2004. Issuance of Permits With Respect to Certain Energy-Related Facilities and Land Transportation Crossings on the International Boundaries of the United States. May 5, 2004. Federal Register 69(87):25299-25301.

_____. 2009. Revised Designation of Critical Habitat for the Wintering Population of the Piping Plover (*Charadrius melodus*) in Texas. May 19, 2009. Federal Register 74:23475-23600.

_____. 2010a. Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered. March 23, 2010. Federal Register 75(55):13910-14014.

_____. 2010b. Endangered and Threatened Wildlife and Plants; 12-Month Findings for Petitions to List the Sprague's Pipit as Endangered or Threatened Throughout Its Range. September 15, 2010. Federal Register 75(178):56028-56050.

Fitzgerald, J.P., C.A. Meaney, and D.M. Armstrong. 1994. Mammals of Colorado. Denver Museum of Natural History and University Press of Colorado. 467 pp.

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. 8 pp.

FR. See Federal Register.

Fuller, P.L. 2003. Freshwater aquatic vertebrate introductions in the United States: Patterns and pathways. Pp. 123–151 in Invasive Species: Vectors and Management Strategies. G.M. Ruiz and J.T. Carlton (eds.). Island Press, Washington, DC.

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. Report prepared for the U.S. Geological Survey, Columbia Environmental Research Center. Montana Fish, Wildlife and Parks, Fort Peck, MT.

Garton, E.O., J.W. Connelly, J.S. Horne, C.A. Hagen, A. Moser, and M.A. Schroeder. 2011. Greater sage-grouse population dynamics and probability of persistence. In: Greater Sage-Grouse Ecology and Conservation of a Landscape Species and its Habitat. S.T. Knick and J.W. Connelly Eds. Studies in Avian Biology, A Publication of the Cooper Ornithological Society. University of California Press. 646 pp.

Gollop, J.B., T.W. Barry, and E.H. Iversen. 1986. Eskimo curlew a vanishing species? Saskatchewan Natural History Society Special Publication No. 17. Regina, Saskatchewan. Northern Prairie Wildlife Research Center Online. Website: http://www.npwrc.usgs.gov/resource/birds/curlew/index.htm (Version 16 Jul 1997). Accessed December 10, 2012.

Haig, S.M. 1986. Piping Plover Species Distribution. U.S. Fish and Wildlife Service, Endangered Species Information System Workbook I.

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.

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 No. 4:137.

Hillman, C.N. 1968. Life History and Ecology of the Black-Footed Ferret. M.S. Thesis. South Dakota State University, Brookings, South Dakota. 28 pp.

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. 1113 pp.

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. Prepared for Keystone Pipeline Project.

_____. 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.

Hornaday, W.T. 1916. Save the sage-grouse from extinction, a demand from civilization to the western states. New York Zoological Park Bulletin 5:179-219.

Howe, M.A. 1987. Habitat Use by Migrating Whooping Cranes in the Aransas-Wood Buffalo Corridor, pages 303-311. In: J.C. Lewis and J. W. Ziewitz, eds. Proc. 1985 Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and USFWS, Grand Island, Nebraska.

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.

Johnsgard, P.A. 1986. Birds of the Rocky Mountains with particular reference to national parks in the Northern Rocky Mountain region. Colorado Associated University Press, Boulder. xi + 504 pp.

Johnson, D.H., M.J. Holloran, J.W. Connelly, S.E. Hanser, C.L. Amundson, and S.T. Knick. 2011. Influences of environmental and anthropogenic features on greater sage-grouse populations, 1997-2007. In: Greater Sage-Grouse Ecology and Conservation of a

Landscape Species and It Habitat. S.T. Knick and J.W. Connelly Eds. Studies in Avian Biology, A Publication of the Cooper Ornithological Society. University of California Press. 646 pp.

Jones, S.L. 2010. Sprague's Pipit (*Anthus spragueii*) conservation plan. U.S. Department of Interior, Fish and Wildlife Service, Washington, D.C. Available online at: http://www.fws.gov/mountain-prairie/species/birds/spraguespipit/index.html. Accessed December 10, 2012.

Jurzenski, J., and W.W. Hoback. 2010. Updated distribution of American burying beetle in Nebraska and predictive model of its occurrence. Prepared for USFWS.

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.

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.

Linder, R.L., R.B. Dahlgren, and C.N. Hillman. 1972. Black-Footed Ferret Prairie Dog Interrelationships. Reprint from 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. 37 pp.

Lingle, G.R. 1987. Status of Whooping Crane Migration Habitat within the Great Plains of North America, pages 331-340. In: J.C. Lewis and J. Zewitz, eds. Proc. 1985. Crane Workshop. Platte River Whooping Crane Habitat Maintenance Trust and USFWS, Grand Island, Nebraska.

Lingle, G.R., G.A. Wingfield, and J.W. Ziewitz. 1991. The Migration Ecology of Whooping Cranes in Nebraska, U.S.A. pages 395-401. In: J. Harris, ed. Proc. 1987 International Crane Workshop, International Crane Foundation, Baraboo, Wisconsin.

MFWP. See Montana Fish, Wildlife & Parks.

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. Minnesota Department of Natural Resources. Website: http://www.dnr.state.mn.us/eco/prairies.html. Accessed December 10, 2012.

MNHP. See Montana Natural Heritage Program.

Montana Audubon. 2012. Important Bird Areas. Helena, Montana. Available online at: http://mt audubon. org/birds/areas.html. Accessed August 29, 2012.

Montana Field Guide. 2012a. Greater sage-grouse species account. Website: http://fieldguide.mt. gov/ detail_ABNLC12010.aspx. Accessed August 28, 2012.

_____. 2012b. Sprague's pipit species account. Website: http://fieldguide.mt.gov/ detail_AB NLC12010.aspx . Accessed August 28, 2012.

Montana Natural Heritage Program. 2008. Email response to data request from M. Miller (MNHP) to P. Lorenz (AECOM). July 1, 2008.

Montana Natural Heritage Program and Montana Fish, Wildlife and Parks (MNHP and MFWP). 2012. Sprague's Pipit — Anthus spragueii. Montana Field Guide. http://fieldguide.mt.gov/detail_ABNLC12010.aspx . Accessed on October 31, 2012.

Montana Sage Grouse Work Group. 2005. Management Plan and Conservation Strategies for Sage Grouse in Montana – Final. Montana Sage Grouse Work Group.

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 powerline strikes in the central Platte River, Nebraska 2008-2009 Final Report. Department of Biology, University of Nebraska-Kearney, Kearney, NE 68849. 34 pp.

NatureServe. 2009. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Website: http://www.natureserve.org/ explorer. Accessed December 10, 2012.

Nelson, D.L. 1998. Least Tern. In: Colorado Breeding Bird Atlas. H.E. Kingery ed. Published by Colorado Bird Atlas Partnership; co-published by Colorado Division of Wildlife, pages 192-193.

Oklahoma State University. 1993. Oklahoma's Endangered and Threatened Species. Forestry Extension Report #6. Oklahoma Cooperative Extension Service, Division of Agricultural Sciences and Natural Resources, Oklahoma State University. 43 pp

Peterson, R.T. 1980. A Field Guide to the Birds of Eastern and Central North America. Fourth Edition. Houghton Mifflin Company. Boston, MA.

Phillips, L. 2003. Pollination of Western Prairie Fringed Orchid, *Platanthera praeclara*: Implications for Restoration and Management. Restoration and Reclamation Review Student On-Line Journal (Hort 5015/5071). University of Minnesota, St. Paul, Minnesota (USA) Department of Horticultural Science. Website: http://purl.umn.edu/60217. Accessed: December 10, 2012.

PHMSA. See Pipeline and Hazardous Materials Safety Administration.

Pukowski, E. 1933. Ökoloische untersuchungen an Necrophorus F.Z. Morphol. Ökol. 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.

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.

Scott, M.P. 1998. The ecology and behavior of burying beetles. Annual Review of Entomology 43: 595-618.

SDGFP. See South Dakota Department of Game, Fish, and Parks.

Sheviak, C.J., and M.L. Bowles. 1986. The prairie fringed orchids: a pollinator-isolated species pair. Rhodora 88:267-290.

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: Wickett, R.G., P.D. Lewis, A. Woodliffe, and P. Pratt, eds. Spirit of the land, our prairie legacy. Proceedings of the Thirteenth North American Prairie Conference; 1992 August 6-9, Windsor, Ontario, Canada. Windsor, Ontario, Canada: Department of Parks and Recreation, pages 141-146.

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.

Sieg, C.H. 1997. The mysteries of a prairie orchid. Endangered Species Bulletin, XXII(4): 12-13.

Sieg, C.H., and P.M. Wolken. 1999. Dynamics of a threatened orchid in flooded wetlands. In: Springer, J.T. ed. The central Nebraska loess hills prairie: Proceedings of the sixteenth North American Prairie Conference, 16:193-201.

South Dakota Department of 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.

Stubbendieck, J., and S.J. Tunnell. 2008. Seventy-eight Years of Vegetation Dynamics in a Sandhills Grassland. Natural Area Journal 28(1): 58-65.

Swenk, M.H. 1926. The Eskimo Curlew in Nebraska. Wilson Bulletin 38: 117-118.

The Wildlife News. 2012. Yet Another Yellowstone Wolf Disperses to South Dakota. Website: http://www.thewildlifenews.com/2012/05/16/yet-another-yellowstone-wolf-disperses-to-south-dakota/. Accessed August 28, 2012.

U.S. Bureau of Land Management (BLM). 2011. Instruction Memorandum No. 2012-043: Greater Sage-Grouse Interim Management Policies and Procedures. U.S. Bureau of Land Management, Washington, D.C.

U.S. Department of State (Department). 2011. Final Environmental Impact Statement Keystone XL Project.

U.S. Department of State (Department). 2012. Supplemental Environmental Impact Statement Keystone XL Project.

U.S. Fish and Wildlife Service (USFWS). 1987. Atlantic coast piping plover recovery plan. USFWS, Newton Corner, Massachusetts. 245 pp.

_____. 1988a. Black-Footed Ferret Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado. 154 pp.

_____. 1988b. Recovery plan for piping plover breeding in the Great Lakes and Northern Great Plains. U.S. Fish and Wildlife Service, Twin Cities, Minnesota. 160 pp.

_____. 1989. Black-footed Ferret Survey Guidelines for Compliance with the Endangered Species Act. Denver, Colorado, and Albuquerque, New Mexico. April 1989. 10 pp.

_____. 1990. Recovery Plan for the Interior Least Tern (*Sterna antillarum*). U.S. Fish and Wildlife Service. Twin Cities, Minnesota. 90 pp.

_____. 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.

_____. 1993. Recovery plan for the pallid sturgeon (*Scaphirhynchus albus*). U.S. Fish and Wildlife Service, Denver, Colorado. 55 pp.

_____. 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. 85 pp. + appendices.

_____. 1996. Western Prairie Fringed Orchid Recovery Plan (*Platanthera praeclara*). U.S. Fish and Wildlife Service, Fort Snelling, Minnesota. Vi + 101 pp.

_____. 2003. Status of Gray Wolf Recovery, Weeds 3/28 to 4/04, 2003. Website: http://www.fws.gov/mountain-prairie/species/mammals/wolf/WeeklyRpt03/wk0404 2003.htm. Accessed August 28, 2012.

_____. 2005. Pallid sturgeon (*Scaphirhynchus albus*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Billings, Montana.

_____. 2007. Western Prairie Fringed Orchid *Platanthera praeclara*. U.S. Fish and Wildlife Service, Mountain-Prairie Region, South Dakota Ecological Services Field Office. Website: http://www.fws.gov/southdakotafieldoffice/ORCHID.HTM. Accessed December 10, 2012.

_____. 2008a. Endangered, Threatened, Proposed, and Candidate Species, Kansas Counties, December 2008. U.S. Fish and Wildlife Service, Ecological Services, Kansas Field Office. Website: http://www.fws.gov/mountain-prairie/endspp/countylists/kansas.pdf. Accessed December 10, 2012.

_____. 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. 38 pp.

_____. 2008c. 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.

_____. 2008d. 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.

_____. 2008e. Letter. U.S. Fish and Wildlife Service, Ecological Services, Nebraska Field Office. October 8, 2008.

_____. 2008f. American burying beetle (*Nicrophorus americanus*). 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service, Concord, New Hampshire. 53 pp.

_____. 2009a. Whooping cranes and wind development – an issue paper. U.S. Fish and Wildlife Service, Regions 2 and 6. 27 pp.

_____. 2009b. Website: http://www.fws.gov/midwest/endangered/plants/index.html#west orchid. Accessed December 10, 2012.

_____. 2010. Region 6 Guidance for Minimizing Effects from Power Line projects within the Whooping Crane Migration Corridor. February 4, 2010. Assistant Regional Director, Ecological Services, Region 6, Mountain Prairie Region, Denver, Colorado.

_____. 2011. Personal Communication. Martha Tacha, U.S. Fish and Wildlife Service, Grand Island, and John Carlson, Bureau of Land Management, Glasgow, Montana. January 6, 2011.

_____. 2012a. Gray wolf status in South Dakota. South Dakota Field Office. Website: http://www.fws.gov/southdakotafieldoffice/WOLF.HTM. Accessed August 28, 2012.

_____. 2012b. Technical Assistance Letter for the TransCanada Keystone XL Pipeline, Nebraska Ecological Services Field Office, Grand Island, Nebraska.

_____. 2012c. Endangered species description for greater sage-grouse. Website: http://www.fws.gov/mountain-prairie/species/birds/sagegrouse/. Accessed on August 28, 2012.

U.S. Fish and Wildlife Service and Nebraska Game and Parks Commission (USFWS and NGPC). 2008. Nebraska American Burying Beetle Trapping Protocol. Grand Island, Nebraska and Lincoln, Nebraska.

U.S. Geologic Service (USGS). 2006. North Dakota's Endangered and Threatened Species Western Prairie Fringed Orchid *Platanthera praeclara*. USGS Northern Prairie Wildlife Research Center. Website: http://www.npwrc.usgs.gov/resource/wildlife/endanger/platprae.htm. Accessed December 10, 2012.

USFWS. See U.S. Fish and Wildlife Service.

USFWS and NGPC. See U.S. Fish and Wildlife Service and Nebraska Game and Parks Commission.

USGS. See U.S. Geologic Service.

Wallestad, R. 1975. Life history and habitat requirements of sage-grouse in central Montana. Montana Department of Fish and Game, Helena, Montana.

Wiens, T.P. 1986. Nest-site tenacity and mate retention in the piping plover. M.S. Thesis. University of Minnesota, Duluth. 34 pp.

Wilson, D.S., and J. Fudge. 1984. Burying beetles: intraspecific interactions and reproductive success in the field. Ecological Entomology 9:195-203.

Wilson, R. 2004. Pallid sturgeon recovery update. Issue No.14:1-25. Website: http://www.fws.gov/ moriver/Pallid%20Sturgeon%20Activities.htm.

Wright, G.D., T.J. Smith, R.K. Murphy, J.T. Runge, and R.R. Harms. 2009. Mortality of cranes (Gruidae) associated with powerlines over a major roost on the Platte River, Nebraska. The Prairie Naturalist 41(3/4):116-120.

BIOLOGICAL ASSESSMENT APPENDICES IN THE SUPPLEMENTAL ENVIRONMENTAL IMPACT STATEMENT

To reduce duplication in the Supplemental Environmental Impact Statement, some of the Biological Assessment appendices are not attached. Others are not attached because they contain confidential or sensitive information and were only included in agency submittals. The following table lists the location of the appendices for the Supplemental EIS publication.

	Biological Assessment Appendix	Provided at
A	Letters of Section 7 Consultation Commitments from Power Providers	BA Appendix A SEIS Appendix H3
B	Construction, Mitigation, and Reclamation Plan (CMRP)	SEIS Appendix G
C	PHMSA 57 Special Conditions for Keystone XL and Keystone Compared to 49 CFR 195 (Final SEIS: Potential Releases and Pipeline Safety)	SEIS Appendix B
D	Spill Prevention, Control, and Countermeasures (SPCC) Plan and Emergency Response Plan (ERP)	SEIS Appendix I
E	Past, Present, and Reasonably Foreseeable Future Project Descriptions	SEIS Appendix W
F	Pipeline Temperature Effects Study	SEIS Appendix S
G	Pipeline Risk Assessment and Environmental Consequence Analysis	SEIS Appendix P
H	CONFIDENTIAL - NOT UNITED STATES GOVERNMENT (USG) CLASSIFIED A Summary Report of the July 2008 Piping Plover (*Charadrius melodus*) and Least Tern (*Sterna antilarum*) Surveys for the Steele City Segment of the Keystone XL Project	No
I	CONFIDENTIAL - NOT USG CLASSIFIED Summary of 2011 Federally-Listed Species Searches for the Keystone XL Pipeline Project Steele City Segment (including the Western Prairie Fringed Orchid, Interior Least Tern, and Piping Plover)	No
J	CONFIDENTIAL - NOT USG CLASSIFIED Summary of 2012 Special Status Species Searches for the Keystone XL Pipeline Project Nebraska Reroute (including the Western Prairie Fringed Orchid, Interior Least Tern, and Piping Plover)	No
K	Supporting Meeting Summaries, Consultation Letters, and Communications	No
L	CONFIDENTIAL - NOT USG CLASSIFIED Summary of April 2010 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment	No
M	CONFIDENTIAL - NOT USG CLASSIFIED Summary of April 2011 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment	No
N	CONFIDENTIAL - NOT USG CLASSIFIED Summary of April 2012 Aerial Searches for Greater Sage-grouse Leks and Sharptailed Grouse Leks, Keystone XL Pipeline Project Steele City Segment (Montana and South Dakota)	No
O	CONFIDENTIAL - NOT USG CLASSIFIED An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse	No
P	CONFIDENTIAL - NOT USG CLASSIFIED An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse in South Dakota; and Associated Correspondence	No

	Biological Assessment Appendix	Provided at
Q	CONFIDENTIAL - August 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	No
R	CONFIDENTIAL - NOT USG CLASSIFIED Field Survey for Western Prairie Fringed Orchid (*Platenthera praeclara*) and the Small White Lady's-Slipper (*Cypripedium candidum*) along the Keystone XL Project in South Dakota and Nebraska	No

APPENDIX H

2012 Biological Assessment, 2013 Biological Opinion, and Associated Documents

H2 2012 Biological Assessment

Appendix A

Letters of Section 7 Consultation Commitments from Power Providers

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PEOPLE'S ELECTRIC COOPERATIVE

P.O. Box 429
Ada, OK 74821-0429
(580) 332-3031

September 8, 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:

People's Electric Cooperative a power provider located in southeastern Oklahoma, is providing electric service to Pump Station #34 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 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,

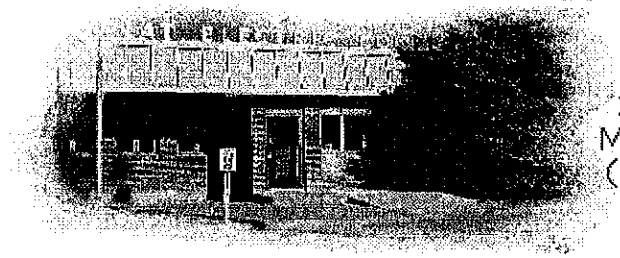
John W. Hudson
Senior Vice President
Operations and Engineering

Your Touchstone Energy® Cooperative
The power of human connections®

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

Big Flat Electric Cooperative, Inc.



PO Box 229
333 S 7th St E
Malta, MT 59538
(406) 654-2040

Serving Blaine, Phillips, & Valley Counties

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.

Sincerely,

Jeanne Barnard

Jeanne Barnard
Manager, Big Flat Electric Co-op., Inc.

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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 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.

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

NorVal 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

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, 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

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.

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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"Engineering with Distinction"
ECI ELECTRICAL CONSULTANTS, INC.
BILLINGS OFFICE: 3521 GABEL ROAD, BILLINGS, MONTANA 59102 • PHONE: 406-259-9933 • FAX: 406-259-3441

September 17, 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:

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

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

wfec
western farmers
electric cooperative

P.O. Box 429 • Anadarko, Oklahoma 73005-0429 • (405) 247-3351 • www.wfec.com

A Touchstone Energy® Cooperative

September 20, 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:

Western Farmers Electric Cooperative (WFEC), a power provider located in Oklahoma, is providing electric service to Pump Stations 33 and 35 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. WFEC is required to complete an Environmental Report (ER) for obtaining funding from Rural Utility Service (RUS). Completing the ER requires consultation with the USFWS.

As such, WFEC is in consultation with the USFWS field office in Tulsa, Oklahoma. WFEC has consulted with the Tulsa office on possible impacts to the whooping crane, interior least tern, and piping plover that may occur in certain specific areas along the power line corridors. In addition, WFEC has also been in consultation concerning the American burying beetle.

Enclosed are proposed maps of the power lines and substations we intend to build to service the Keystone XL Project as well as copies of the consultation letters with the Tulsa office.

If you have any questions please contact me at 405-247-4298 or by email at k_fletcher@wfec.com.

Sincerely,

Kent Fletcher

Kent Fletcher
Environmental Specialist
Western Farmers Electric Cooperative
405-247-4298, Cell 405-255-3887

Copy: Larry Sibbald, Alan Derichsweiller, Scott Williams

wfec
western farmers
electric cooperative

P.O. Box 429 • Anadarko, Oklahoma 73005-0429 • (405) 247-3351 • www.wfec.com

A Touchstone Energy® Cooperative

September 1, 2010

Dr. Dixie Birch
U.S. Fish and Wildlife Service
9014 East 21st Street
Tulsa, OK 74129

RE: Proposed TransCanada Substation and Tap Transmission Line Construction
Section 34 - T10N - R8E
Seminole County, Oklahoma

Dear Dr. Birch,

Western Farmers Electric Cooperative (WFEC) is in the process of preparing an environmental report (ER) for the Rural Utilities Service (RUS). This report will provide details with regard to environmental impacts for the above-referenced project. Construction activities will entail clearing approximately 0.2 acre of mixed native grass pasture for a new substation and constructing 0.5 mile of electrical transmission line with a 100-foot wide right-of-way (ROW). The transmission line will feature H-frame pole structures at approximately 700-foot intervals. Attached is the vegetative cover map showing the approximate project ROW. The project area provides habitat for white-tailed deer and other small to medium-sized mammals. The area may also provide habitat for mourning doves, bobwhite quail, various songbirds, and small game species such as rabbits and squirrels.

Federally-listed species for the county include:

The **interior least tern** (*Sterna antillarum*) inhabits bare river sandbars with adjacent open reaches of river, broad sandy areas, and salt plains. The least tern leaves Oklahoma by early September and winters along the coast of Central and South America. No suitable habitat for the interior least tern was present on or in the immediate vicinity of the project ROW; therefore, this project will have no effect on the interior least tern.

The **piping plover** (*Charadrius melodus*) is a migratory shorebird which generally occupies drier portions of open sandy areas along rivers and reservoirs. No suitable habitat for the piping plover was present on or in the immediate vicinity of the project ROW; therefore, this project will have no effect on the piping plover.

The **whooping crane** (*Grus americana*) inhabits open marshes and wetlands. The species migrates between breeding grounds in the northern US and Canada and the Texas gulf coast. While the project area may be within this migration corridor, no suitable habitat for the whooping crane was present on or in the immediate vicinity of the project ROW; therefore, this project will have no effect on the whooping crane.

The **American burying beetle** (*Nicrophorus americanus*) (ABB) is an endangered insect that occurs in Oklahoma. The ABB is a nocturnal species which is generally active between May 20 and September 20. During the rest of the year, ABBs remain inactive underground. Approximately six (6) acres of suitable ABB habitat was observed within the proposed project area. During July 2010, ENERCON conducted a presence-absence survey according to USFWS guidelines. The results of the survey were positive. Based on the results of the survey, it is assumed that ABBs are present within project area. WFEC will conduct bait way efforts prior to the ABB inactive season. Because of this, the project may affect but is not likely to adversely affect the ABB.

The **Arkansas River shiner** (*Notropis girardi*) inhabits unshaded, broad, sandy, main channels of major streams and rivers. No suitable habitat for the Arkansas River shiner was present on or in the immediate vicinity of the project ROW. This project will have no effect on the Arkansas River shiner or critical habitat designated for this species.

WFEC is seeking your concurrence with the above findings.

Additional project issues:

A delineation of potential Section 404 resources (*i.e.* wetlands and other waters of the US) documented two small wetlands and a farm pond within the proposed project ROW. Storm water best management practices (BMPs) will be implemented prior to construction to ensure that sediment is not discharged into the receiving waters.

Federal Emergency Management Agency (FEMA) floodplain maps were reviewed for Seminole County. The proposed project area is not located within a mapped floodplain. Because of this, Seminole County Floodplain Construction Permits are not required for the proposed project.

WFEC would like to start construction on this project as soon as possible. We would appreciate your response within 30 days. If WFEC does not hear from your agency within the 30 days we will assume you have no comments regarding the project. If you have any questions or need further information please call me at (405) 247-4298 or contact me by email at k_fletcher@wfec.com.

Sincerely,

Kent Fletcher

Kent Fletcher
Environmental Specialist

Copy: Eddie Childs, Kyle Power, Steve Coon
File: TransCanada Substation and Tap Transmission Line

Attachments:
Vegetative Cover Map

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

WEST CENTRAL
Electric Cooperative, Inc.
A Touchstone Energy® Cooperative

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

MANAGEMENT STAFF

Steve Reed – *CEO/Manager*

Dean Nelson – *Operations Manager* Joe Connot – *Member Services Director* Jeff Birkeland – *Finance Manager*

OGE Energy Corp. PO Box 321
Oklahoma City, Oklahoma 73101-0321
405-553-3000
www.oge.com

October 7, 2010

OGE

Mr. John Cochnar
Acting Field Supervisor
U.S. Fish and Wildlife Service
203 West Second Street
Grand Island, NE 68801

Re: Keystone XL Pipeline Project

Dear Mr. Cochnar:

In a letter dated June 1, 2010, the United States Fish and Wildlife Service's (USFWS) Field Office in Grand Island Nebraska informed the United States Department of State that it had reviewed the latter's Draft Biological Assessment (DBA) associated with the above referenced Project. In the letter, the USFWS stated that, based on its review of the DBA, it believes that the Project may affect and is likely to adversely affect the Whooping Crane, Least Tern, Piping Plover and Western Prairie Fringed Orchid based on the proposed installation of overhead power lines that will provide electrical service to the various pump stations to be located along the pipeline's route.

This is to inform you that OGE Energy Corp. will be providing electric service to one such pump station (i.e. Pump Station No. 32) to be located near Cushing, Oklahoma. In order to provide electrical service to the pump station, overhead power lines will be installed. In that regard, OGE agrees to consult with the USFWS's field office in Tulsa, Oklahoma regarding any mitigative or protective measures that can be incorporated into the design of the power lines in order to minimize their impact on the Whooping Crane, Interior Least Tern and Piping Plover along the power line's corridor.

Once the line route has been finalized, a map depicting the same will be provided to the Tulsa field office. In the meantime, should you have any questions concerning OGE's involvement in the project, feel free to call me at (405) 553-3177.

Sincerely,

Kenneth E. Raymond
Sr. Env. Regulatory Analyst
Corp. Env., Health & Safety
OGE Energy Corp.

WM1938

Westar Energy.

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,

Brad Loveless
Director, Biology & Cons. Programs
Westar Energy

cc: Stacy Kramer, Westar Energy
Larry Sibbald, Trans Canada

818 S Kansas Ave / PO Box 889 / Topeka, Kansas 66601-0889

File: ENV705.1211

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.

General Office
1414 15th Street / PO Box 499 / Columbus, NE 68602-0499
***Telephone:** (402) 564-8561 / **Fax:** (402) 563-5527*
www.nppd.com

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)

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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 Cochnar

John Cochnar
Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)

NEBRASKA
— GAME PARKS —

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 Neb. Rev. Stat. § 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,

Michelle R Koch

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

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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 Cochnar

John Cochnar
Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)

NEBRASKA
— GAME PARKS —

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 Neb. Rev. Stat. § 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,

Michelle R Koch

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

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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 Cochnar
Acting Nebraska Field Supervisor

cc: NGPC; Lincoln, NE (Attn: Michelle Koch)

NEBRASKA
— GAME PARKS —

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 Neb. Rev. Stat. § 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,

Michelle R Koch

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

PUBLIC UTILITIES COMMISSION

CITY OF CLAY CENTER

MUNICIPAL ELECTRIC & WATER

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GARY GRIFFITHS, Commissioner
DONALD BUTTON, Commissioner
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427 Court Street
P.O. Box 117
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September 14, 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. Crochnar:

Clay Center Public Utilities Commission, a power provider located in Clay Center, Kansas, is providing electric service to Pump Station 27 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,

Bill Callaway
Supt. of Utilities
Clay Center Public Utilities Commission

"Engineering with Distinction"
ECI ELECTRICAL CONSULTANTS, INC.
CORPORATE OFFICE: 3521 GABEL ROAD, BILLINGS, MONTANA 59102 • PHONE: 406-259-9933 • FAX: 406-259-3441

RECEIVED
OCT 2010
U.S. FISH & WILDLIFE SERVICE

October 14, 2010

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.

Sincerely,

Linda Lee

Linda Lee
Assistant Environmental Planner

Enc.

R:\Projects\S40-076, 077, 078 PS15, PS16, PS17\Correspondence\US Fish & Wildlife Service - Larson 10.11.10.doc

BILLINGS OFFICE:
3521 GABEL ROAD
BILLINGS, MT 59102
PHONE: 406-259-9933
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TUCSON, AZ 85704
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MADISON OFFICE:
5315 WALL STREET
MADISON, WI 53718
PHONE: 608-240-9933
FAX: 608-240-1579

CWP Project Code	Improvement 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 155th 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 CODE	**CWP PROJECT CODE DESCRIPTION**
200*	**Build New Tie Lines – Designates construction of new line for the purpose of connecting two or more existing circuits or substation bus**
300*	**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)**

Confidential – Not United States Government classified.

This information is not included in the Final Supplemental EIS.

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FISH AND WILDLIFE SERVICE
Ecological Services
Nebraska Field Office
203 West Second Street
Grand Island, Nebraska 68801

May 15, 2013

FWS-NE: 2013-164

K. Nicole Gibson, Ph.D.
Endangered Species Act Lead,
U.S. Department of State
OES/FO Room 3880
Washington, D.C. 20520

Subject: Transmittal of the U.S. Fish and Wildlife Service's 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.

Dear Dr. Gibson:

This document transmits the United States Fish and Wildlife Service's (USFWS) Biological Opinion (BO) regarding potential impacts of the proposed Keystone XL pipeline (Project) to the federally endangered black-footed ferret *(Mustela nigripes)*, interior least tern *(Sternula antillarum)*, whooping crane *(Grus americana)*, pallid sturgeon *(Scaphirhynchus albus)*, and American burying beetle *(Nicrophorus americanus)*(ABB); and threatened piping plover *(Charadrius melodus)* and western prairie fringed orchid *(Platanthera praeclara)*. Additionally, this BO also provides measures that would contribute to the conservation of two federal candidate bird species, the greater sage-grouse *(Centrocercus urophasianus)* and Sprague's pipit *(Anthus spragueii)*, that would likely be impacted by the Project. This consultation document has been prepared pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (Act) (16 United States Code [U.S.C.] § 1531 et seq.) and 50 Code of Federal Regulations [C.F.R] § 402 of our interagency regulations governing section 7 of the Act.

Section 7(a) (2) of the Act requires Federal agencies to consult with the USFWS to ensure that any action authorized, funded, or carried out is not likely to jeopardize the continued existence of any federally listed species nor destroy or adversely modify critical habitat. The proposed Project is the construction and operation of a 36-inch diameter oil pipeline with associated facilities from Hardisty, Alberta, Canada to Steele City, Nebraska with two pumping stations proposed for construction in Butler and Clay counties in Kansas. The direct and indirect effects, as well as the effects from any interrelated and interdependent actions, and cumulative effects, are considered in this BO to determine if the proposed Project is likely to jeopardize the aforementioned federally listed species.

Keystone has applied to the U.S. Department of State (Department) for a Presidential Permit for the construction, connection, operation, and maintenance of the proposed Project pipeline and associated facilities at the border of the United States for importation of crude oil from Canada. The Department receives and considers such applications for Presidential Permits for facilities to transport petroleum, petroleum products, coal, and other fuels transmission projects pursuant to the President's constitutional authority, which authority the President has delegated to the Department in Executive Order (Exec. Order No.) 13337, as amended (69 Federal Register [Fed. Reg.] 25299). Under EO 13337, the Secretary of State may issue a Presidential Permit for a border crossing facility if he finds that issuing such a permit would be in the "national interest." EO 13337 also specifies a process for the Department to seek the views from certain other agencies on whether issuing a permit would be in the national interest. It was determined in consultation with other agencies (including Bureau of Land Management (BLM) and the United States Army Corps of Engineers (USACE)) that the Department would act as the lead federal agency for the environmental review of the proposed Project consistent with National Environmental Policy Act (NEPA). Consequently, the Department is also the lead agency consulting with the USFWS consistent with Section 7 of the ESA. Other federal actions associated with the proposed Project may require separate section 7 consultation with the USFWS.

Several federal agencies are cooperating agencies with the Department, and involved in some capacity with the proposed Project. The proposed Project would affect numerous rivers and wetlands, thus the USACE would issue Section 404 permits as necessary. Because the proposed Project would cross both Federal and private lands, the BLM would evaluate the proposed Project and decide whether to grant Keystone a right-of-way (ROW) authorization for a crude oil pipeline and appurtenant facilities including access roads across those federal lands pursuant to the Mineral Leasing Act (43 C.F.R Part 2880). These federal lands principally include 43 miles of pipeline ROW in Montana, and the proposed pipeline would also cross or go under Bureau of Reclamation facilities on private lands in Montana and South Dakota. The Western Area Power Administration (Western) would own a small section of a 230-kV transmission line in southern South Dakota. This line would supply upgraded load capacity and support voltage requirements for pump stations 20 and 21 (in Tripp County, South Dakota) if the proposed pipeline were to operate at full capacity sometime in the future. Finally, the Rural Utilities Service of the U.S. Department of Agriculture would provide grants to help fund construction of some of the power distribution lines that may be built to provide power to the proposed pipeline pump stations.

Project Changes since the Previous Application

Several changes have been made to the proposed Project since the Final Environmental Impact Statement (Final EIS August 2011) was released and the 2011 BO was withdrawn at the request of the Department by the USFWS on December 21, 2011. In general, there have been 64 route modifications made in Montana, 51 route modifications in South Dakota, and 16 route changes in Nebraska to accommodate landowner concerns and the results of engineering and environmental surveys, and to comply with state permitting requirements. Of these route changes, 2 in Montana, 29 in South Dakota, and 11 route changes in Nebraska are outside the previous project survey corridor. The route changes in Nebraska result from Keystone's agreement to reroute the pipeline around the Nebraska Department of Environmental Quality (NDEQ)-identified Sandhills Region. No changes have been made to the two pump station locations in Kansas. The proposed Project

now includes an ancillary facility that will be used as a rail siding and pipe storage location in North Dakota. This 60-acre pipe yard was used previously as part of TransCanada Pipeline's Bison Pipeline Project.

This BO is based on the best available scientific and commercial data, including E-mail and telephone correspondence, USFWS files, pertinent scientific literature, discussions with recognized species authorities, and other scientific sources. Further, this BO uses information from the December 21, 2012, Biological Assessment (BA) that was submitted to the USFWS by the Department (DOS 2012).

Consultation History

The USFWS's Nebraska Field Office in Grand Island, Nebraska, is delegated the lead office to conduct the consultation with the Department. However, other USFWS Ecological Services Field Offices in Montana, North Dakota, South Dakota, and Kansas were actively involved in the review of the Project during informal consultation beginning in 2008, and provided input on draft consultation documents throughout the consultation.

In September 2011, the USFWS released a BO with an incidental take statement for the American burying beetle (ABB) in South Dakota, Nebraska, and Oklahoma. Subsequently, the USFWS withdrew the BO at the Department's request based on Keystone's agreement with Nebraska to reroute the pipeline in Nebraska to avoid the NDEQ-identified Sandhills Region. Keystone has since filed a new Presidential Permit application with the Department (May 2012). In June 2012, the Department initiated section 7 consultation for the May 2012 Keystone XL Pipeline Presidential Permit application. The Department submitted to the USFWS, a 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. 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 under construction. The proposed Project encompasses a slightly revised "Steele City" segment of the previous proposed Project and is the subject of this BO. Construction and operation of the proposed Project may affect habitats and populations of species protected under Act and by individual state legislation in the aforementioned states. This BO addresses these federally protected species and updated proposed Project information.

The following bulleted items provide a summary of correspondence, species-specific survey information, and continued informal consultation with the USFWS regarding coordination of biological surveys and determination of biological impacts from the previously proposed Project and the new proposed Project. The previously proposed Project had a different geographic scope that included Texas and Oklahoma. Meeting summaries below include Texas and Oklahoma, which were part of the previously proposed Project. They are included here to provide a sense of the extensive agency coordination that has occurred on this Project from 2008 to 2013. Supporting meeting summaries, consultation letters, and other communications are included in the 2012 BA (DOS 2012), in files at the USFWS's Nebraska Ecological Services Field Office located in Grand Island, Nebraska and other USFWS Ecological Services Field Offices in Montana, North Dakota, South Dakota, and Kansas.

- April 2008: Keystone sent initial consultation letters for the Steele City Segment (Montana, South Dakota, and Nebraska) to the USFWS, BLM, state wildlife agencies, and state natural heritage programs to request their input in 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., federal or state listed), have high economic value (e.g., big game, waterfowl), or are considered important resources (e.g., raptors, fish). The consultation 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 Project, and approximate mileposts where potential habitat was identified along the ROW.

- May 5, 2008: Keystone met with the Nebraska Game and Parks Commission (NGPC) and the USFWS 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 Project area. The goal of the meeting 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 practices (BMPs) documents for future agency verification.

- May 8, 2008: Keystone met with the USFWS and the Montana Fish, Wildlife, and Parks (MFWP) 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 Project area. The goal of the meeting 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 BMPs documents for future agency verification. The MFWP requested a follow-up meeting with additional technical staff from MFWP (Regions 6 and 7).

- June 10, 2008: Keystone met with staff from USFWS and South Dakota Department of Game, Fish, and Parks (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 Project area. The goal of the meeting 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 BMPs for future agency verification.

- July 29, 2008: Keystone met with staff from the BLM Glasgow Field Office and MFWP Region 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 Project area. The goal of the meeting was to discuss agency recommendations based on the information sent to them in April 2008 for species occurrence, habitat assessments, and future field surveys. Keystone incorporated input from the meeting into survey protocols and BMPs for future agency verification.

- December 3, 2008: Keystone received a consultation letter from the USFWS's Ecological Services Field Office in Tulsa, Oklahoma, regarding recommendations for the proposed list of threatened and endangered species about species-specific surveys, habitats of special concern, and BMPs for projects affecting rivers, streams, and tributaries. The USFWS requested formal consultation with the Department to address take of ABB.

- January/February 2009: Keystone initiated section 7 consultation with the USFWS. Keystone continued discussions with BLM, and state wildlife agency offices for Montana, South Dakota, and Nebraska that included state-specific special status species survey protocols and BMPs 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.

- January 27, 2009: Keystone met with staff from the USFWS and SDGFP at the SDGFP office in Pierre, South Dakota, to discuss issues pertaining to special status species surveys. The goals of the meeting were 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, informal consultation package. The USFWS and SDGFP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- February 3, 2009: Keystone met 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. The goals of the meeting were 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, consultation package. The BLM and MFWP provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- February 5, 2009: Keystone held a conference call with staff from the BLM Glasgow, Malta, and Miles City field offices to discuss issues pertaining to special status species surveys. The goals of the meeting were 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 informal consultation package. The BLM provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- February 19, 2009: Keystone met with staff from the USFWS's Nebraska Ecological Services Field Office and NGPC at the NGPC office in Lincoln, Nebraska, to discuss issues pertaining to special status species surveys. The goals of the meeting were 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 informal consultation package. The USFWS and NGPC provided additional recommendations to Keystone's sensitive species mitigation approach to be updated prior to final agency concurrence.

- May 19, 2009: Keystone sent E-mail correspondence to the USFWS's Oklahoma Ecological Services Field Office regarding survey protocols for the interior least tern. Comments and

concurrence were received on the survey locations and methodology on June 17, 2009, and surveys were initiated following receipt of approval.

- June 16, 2009: Keystone held a conference call with staff from the USFWS's Oklahoma Ecological Services Field Office to discuss issues pertaining to the ABB. The goals of the meeting were to determine the next steps in the consultation process for the ABB and verify that the USFWS was receiving the information they required.

- June 25, 2009: Keystone called C. Bessken of the South Dakota Ecological Services Field Office regarding a geotech activity clearance. The USFWS discussed the need for formal section 7 consultation with the Department to address take of the ABB in South Dakota.

- March 2, 2010: Project personnel held a conference call with USFWS about endangered species and migratory bird surveys. The goal of the call was to discuss helicopter survey timing windows for raptors/rookeries and bald eagles in 2010. The need for conducting additional pedestrian surveys for piping plovers was also discussed.

- June 1, 2010: The USFWS provided the Department with comments on the Draft BA of impacts of the proposed Project to threatened and endangered species. Comments from USFWS Ecological Services Field Offices in Nebraska, South Dakota, Oklahoma, and Texas were included.

- June 3, 2010: The USFWS provided the Director of the Office of Environmental Compliance, Department of the Interior combined comments from Region 6 (Denver) and Region 2 (Albuquerque) on the Draft Environmental Impact Statement for the proposed Project.

- September 3, 2010: Keystone met with the USFWS, Keystone, the Department, and Cardno ENTRIX (a consultant), regarding the requirements for formal consultation on the effects of the Keystone XL Pipeline Project.

- September 9, 2010: A meeting was held between USFWS, BLM, and Keystone regarding mitigation and construction stipulations for greater sage-grouse.

- October 12, 2010: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's section 7 formal consultation on federally listed species.

- December 30, 2010: The USFWS provided comments to Keystone and Cardno ENTRIX on the November 2010 draft BA of impacts to threatened and endangered species from the proposed Keystone XL pipeline.

- December 30, 2010: The USFWS provided comments on the November 29, 2010, revision of the ABB Survey Report to Keystone and Cardno ENTRIX.

- January 7, 2011: A meeting was held between the USFWS, Keystone, and Cardno ENTRIX to discuss USFWS comments on the preliminary 2011 BA.

- January 12, 2011: Meetings continued between USFWS, Keystone, NGPC, and Cardno ENTRIX regarding the Keystone XL Pipeline Project's section 7 formal consultation on federally listed species.

- February 2, 2011: Personnel from the USFWS, Keystone, the Department, and Cardno ENTRIX (for DOS) met to continue discussions about the BA needed for section 7 formal consultation on effects of the Keystone XL Pipeline Project on federally listed species.

- February 17, 2011: Personnel from the USFWS, Department, and Cardno ENTRIX met to continue discussions about the BA needed for section 7 formal consultation on effects of the Keystone XL Pipeline Project on federally listed species.

- March 24, 2011: Personnel from the USFWS, Department, Keystone, NGPC, and Cardno ENTRIX met to continue discussions about the BA needed for section 7 formal consultation on effects of the Keystone XL Pipeline Project on federally listed species.

- April 21, 2011: Personnel from the USFWS, Keystone, Department, and Cardno ENTRIX (for DOS) met to continue discussions about the BA needed for section 7 formal consultation on effects of the Keystone XL Pipeline Project to the ABB. The discussion included potential impacts to wooded areas in Oklahoma.

- April 21, 2011: Personnel from Keystone and the Department met to continue discussions about the BA needed for section 7 formal consultation on the effects of the Keystone XL Pipeline Project on federally listed species. Discussions included monitoring and habitat restoration bonding.

- April 27, 2011: Personnel from the USFWS and Department met to continue discussions about the BA needed for section 7 formal consultation on effects of the Keystone XL Pipeline Project to the ABB. The discussion included monitoring and habitat restoration bonding.

- May 19, 2011: The Department submitted the 2011 BA to the USFWS with a letter requesting initiation of formal consultation. The BA analyzed the potential effects from the proposed Project to species protected under the Act (DOS 2011).

- August 26, 2011: The Department issued the Final Environmental Impact Statement (2011 Final EIS) to cooperating agencies and the public.

- September 6, 2011: The USFWS issued their 2011 BO on the Effects to Threatened and Endangered Species from the Construction and Operation of the previously Proposed Keystone XL Pipeline.

- December 20, 2011: The Department requested that the USFWS withdraw their 2011 BO for the previously proposed Keystone XL Project.

- December 21, 2011: The USFWS withdrew their 2011 BO for the previously proposed Keystone XL Project.

- May 2012: Keystone filed a new Presidential Permit Application with the Department.

- June 27, 2012: The USFWS, Department, BLM, Montana Department of Environmental Quality (MDEQ), MFWP discussed project status and schedule of the proposed Keystone XL Project. This meeting initiated section 7 consultation with the USFWS on the proposed Project.

- July 6, 2012: Meetings between the USFWS, Department, and BLM continued regarding the section 7 consultation under the Act for the proposed Project.

- August 28, 2012: The Department submitted a species list of federally protected and candidate species and federally designated critical habitat to the 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.

- September 7, 2012: Keystone submitted the TransCanada Keystone XL Pipeline Project Environmental Report to the Department with an applicant-prepared Draft BA.

- September 28, 2012: The USFWS submitted a Technical Assistance letter for the proposed Project to the Department with a list of species and potential project effects that may occur in the proposed Project area.

- October 9-10, 2012: A meeting was held between the USFWS, Department, Keystone, BLM, NGPC, NDEQ, and MFWP regarding the proposed Project's section 7 consultation under the Act. Discussion included the ABB and other federally listed species, and state-protected species, the draft BA, species surveys, avoidance, minimization, and compensation measures.

- October 19, 2012: The USFWS provided extensive comments on the draft BA for the Project.

- October 23, 2012: A meeting was held between the USFWS, Department, SDGFP, BLM, and Keystone regarding the greater sage–grouse and a compensatory mitigation plan for the species in South Dakota. Discussions included a management plan and avoidance, minimization, and mitigation strategies.

- December 14, 2012: The USFWS provided extensive comments on the draft BA for the Project.

- December 21, 2012: The Department submitted a Final 2012 BA to the USFWS with a letter requesting initiation of formal consultation. The BA analyzed the anticipated effects of the proposed Project to numerous species protected under the Act and included

avoidance, minimization, and compensation strategies. Table 1 lists the species and the effect determinations reached in the BA by the Department (DOS 2012).

- March 1, 2013: The Department issued the 2013 Draft Supplemental EIS to cooperating agencies and the public.

Species Determinations

In its BA, the Department has considered the effects of the proposed Project on federally listed species and designated critical habitat and has made several determinations of effect as shown in Table 1. Further, the Department also considered the effects of the proposed Project on candidate species. The USFWS concurs with the determinations made by the Department that the proposed Project may affect but is not likely to adversely affect the endangered black-footed ferret, interior least tern, whooping crane, and pallid sturgeon; and the threatened piping plover and western prairie fringed orchid. A detailed discussion of factors contributing to our concurrence with the above not likely to adversely affect (NLAA) determinations is included in the Conservation Measures Section of this BO with supporting information on file at the USFWS's Nebraska Ecological Services Field Office.

The USFWS acknowledges the "no effect" determinations made by the Department including the gray wolf, Eskimo curlew, Topeka shiner, and blowout penstemon. Finally, we concur with the determination that the proposed Project may affect and is likely to adversely affect the ABB. Therefore, this BO analyzes the effects of the proposed Project along with the effects of interrelated and interdependent actions on the ABB, because the Keystone XL pipeline may affect and is likely to adversely affect this species. No critical habitat has been designated for the ABB.

The BA also addressed two candidate species: the greater sage-grouse and Sprague's pipit. In its BA, the Department determined that the proposed Project may effect, but is not likely to adversely affect these species (DOS 2012). Please note that our section 7 consultation would not apply to candidate species for this Project. As such, we would defer our concurrence/nonconcurrence on this determination should either species be listed in the future. In the meantime, we commend the Department for including the greater sage-grouse and Sprague's pipit in this BA even though they are not listed. We have concluded that implementation of several measures by Keystone for the greater sage-grouse and Sprague's pipit would certainly contribute to their conservation.

Table 1. Species considered in the 2012 BA analyses for the proposed action and effect determinations.

Common Name	**Scientific Name**	**Federal Status**	**Conclusion**[1]	**Rationale**
Mammals				
Black-footed ferret	*Mustela nigripes*	Endangered Experimental Populations	NLAA/ NLAA	No potential reintroduction sites present in MT, SD, or NE; no habitat present in Project area.
Gray Wolf	*Canis lupus*	Endangered/ Experimental Populations	No Effect/ No Effect	Not Present in SD, NE, or KS; delisted in MT
Birds				
Eskimo curlew	*Numenius borealis*	Endangered	No Effect	Not present
Interior least tern	*Sternula antillarum*	Endangered	NLAA	Conservation measures adequate
Piping plover	*Charadrius melodus*	Threatened	NLAA	Conservation measures adequate
Whooping crane	*Grus americana*	Endangered	NLAA	Conservation measures adequate
Fish				
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	NLAA	Conservation measures adequate
Topeka shiner	*Notropis topeka*	Endangered	No Effect	Habitat not affected
Invertebrates				
American burying beetle	*Nicrophorus americanus*	Endangered	MALAA	Habitat and individuals adversely affected
Plants				
Blowout penstemon	*Penstemon haydenii*	Endangered	NLAA	Habitat will be avoided
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	NLAA	Conservation measures adequate

[1] NLAA – May affect, not likely to adversely affect
MALAA – May affect, likely to adversely affect.

BIOLOGICAL OPINION

Description of the Proposed Action

The Federal Action under consideration is the potential issuance by the Department of a Presidential Permit to authorize the crossing of the United States-Canada border by a crude oil transmission system that extends from an oil supply hub near Hardisty, Alberta, Canada, and crosses the states of Montana, South Dakota, and Nebraska before it ends at Steele City, Nebraska (Figure 1). From Steele City, crude oil is then transported via existing pipelines to destinations in the United States. The project also includes an ancillary facility (rail siding and pipe storage location) in North Dakota and the construction of two pumping stations in Clay and Butler counties in Kansas along the existing Keystone Cushing Pipeline Extension. The scope of the proposed Presidential Permit would be for construction, connection, operation, and maintenance of the proposed Keystone XL pipeline and its associated facilities.

Keystone has applied to the Department for a Presidential Permit for the construction, connection, operation, and maintenance of the proposed Project pipeline and associated facilities at the border of the United States for importation of crude oil from Canada. The Department receives and considers such applications for Presidential Permits for facilities to transport petroleum, petroleum products, coal, and other fuels transmission projects pursuant to the President's constitutional authority, which authority the President has delegated to the Department in Exec. Order No. 13337, as amended (69 Fed. Reg. 25299). Under Exec. Order No. 13337, the Secretary of State may issue a Presidential Permit for a border crossing facility if he finds that issuing such a permit would be in the "national interest." Exec. Order No. 13337 also specifies a process for the Department to seek the views from certain other agencies on whether issuing a permit would be in the national interest. It was determined in consultation with other agencies (including BLM and the United States Army Corps of Engineers [USACE]) that the Department would act as the lead federal agency for the environmental review of the proposed Project consistent with National Environmental Policy Act (NEPA). Consequently, the Department is also the lead agency consulting with the USFWS consistent with Section 7 of the ESA.

Several federal agencies are cooperating agencies with the Department, and involved in some capacity with the proposed Project. The proposed Project would affect numerous rivers and wetlands, thus the USACE would issue Section 404 permits as necessary. Because the proposed Project would cross both public and private lands, the BLM would evaluate the proposed Project and decide whether to grant Keystone an ROW across those federal lands pursuant to ROWs under the Mineral Leasing Act (43 C.F.R. Part 2880). These federal lands principally include 43 miles of pipeline ROW in Montana, but the proposed pipeline would also cross or go under Bureau of Reclamation facilities on federal land in Montana and on private land in South Dakota. Western would own a small section of a 230-kV transmission line in southern South Dakota. This line would supply upgraded load capacity and support voltage requirements for pump stations 20 and 21 (in Tripp County, South Dakota) in the future if the proposed pipeline were to operate at full capacity sometime in the future. Finally, the Rural Utilities Service of the Department of Agriculture would provide grants to help fund construction of some of the power distribution lines that may be built to provide power to the proposed pipeline pump stations.

Project Description, Location, and Overview

From north to south, the proposed Project consists of approximately 1,204 miles of new, 36-inch diameter pipeline, with 329 miles in Canada and 875 miles in the United States from Morgan, Montana to Steele City, Nebraska. In the United States, the proposed Project would be constructed in 10 parts or 10 mainline spreads, varying in length between approximately 80 and 94 miles each, in 2014 and 2015 (Table 1) (DOS 2012). The proposed Project would involve the construction of facilities ancillary to the pipeline including pumping stations, main line valves, access roads, rail siding and pipe storage yards (Table 2) (DOS 2012).

Land Requirements

Surface disturbance associated with the construction and operation of the proposed Project by state is summarized on Table 3. Approximately 16,277 acres of land would be disturbed during construction of the proposed facilities in Montana, North Dakota, South Dakota, Nebraska, and Kansas. After construction, the temporary ROW (approximately 10,693 acres) would be restored and returned to its previous land use. After construction is complete, approximately 5,584 acres would be retained as permanent ROW and for permanent ancillary facilities. All disturbed acreage would be restored and returned to its previous aboveground land use after construction, except for approximately 286 acres of permanent ROW, which would not be restored but would serve to provide adequate space for aboveground facilities including pump stations and valves, for the life of the proposed pipeline, which is 50 years.

Pipeline Right-of-Way

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 and a 50-foot permanent ROW. The construction ROW would be reduced to 85 feet in certain areas to avoid and minimize impacts on habitat for threatened and endangered species, wetlands, cultural sites, shelterbelts, residential areas, and commercial/industrial areas.

Additional Temporary Workspace Areas

In addition to the typical construction ROW, Keystone has identified typical types of additional temporary workspace 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 impacts covering about 1,206 acres for the proposed Project.

Pipe Stockpile Sites, Railroad Sidings, and Contractor Yards

Extra workspace areas outside of the temporary construction ROW covering approximately 1,805 acres would be required during the construction of the proposed Project to serve as pipe storage sites, railroad sidings, and contractor yards (Table 4) (DOS 2012). Pipe stockpile sites along the pipeline route have typically been identified in proximity to railroad sidings. To the extent practical, Keystone would use existing commercial/industrial sites or sites that previously were used for construction. Existing public or private roads would be used to access each yard. Both

pipe stockpile sites and contractor yards would be used on a temporary basis and would be restored, as appropriate, upon completion of construction.

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. A total of eight temporary construction camps would be established (Table 5) (DOS 2012).

Table 1. Pipeline construction spreads associated with the proposed Project

State	Miles by State	County	Spread Number	Location (Mile Post)	Approximate Length of Construction Spread (Miles)
Montana	285.65	Phillips, Valley	Spread 1	0-90	90
		Valley, McCone	Spread 2	90-151.48	61.48
		McCone, Dawson	Spread 3	151.48-197.68	46.2
		Dawson, Prairie, Fallon	Spread 4	197.68-288.63	90.95
South Dakota	315.29	Harding			
		Harding, Butte, Perkins, Meade	Spread 5	288.63-410.75	122.12
		Meade, Pennington	Spread 6	410.75-500.44	89.69
		Haakon, Jones			
		Jones, Lyman, Tripp	Spread 7	500.44-598.86	98.42
		Tripp	Spread 8	598.86-691.78	92.92
Nebraska	274.44	Tripp, Keya Paha, Boyd, Hold, Antelope			
		Antelope, Boone, Nance, Merrick, Polk	Spread 9	691.78-775.67	83.89
		Polk, York, Fillmore, Saline, Jefferson	Spread 10	775.67-875.38	99.71

Source: exp Energy Services Inc. 2012

Table 2. Description of proposed Project facilities by State.

Segment/State	Ancillary Facilities
Montana	6 pump stations, 25 main line valves (MLVs), 84 access roads
North Dakota	Rail siding, pipe storage yard
South Dakota	7 pump stations, 13 MLVs, 59 access roads
Nebraska[a]	5 pump stations, 4 MLVs, 48 access roads
Kansas	2 pump stations

[a] There were four MLVs proposed in the Final EIS for the proposed route. Other Nebraska valve locations are being determined at this time. The total number of pump stations and access roads has been preliminarily identified based on the proposed route.

Table 3. Summary of Lands Affected for the Proposed Project

		Lands Affected (Acres)	
State	**Facility**	**Construction**	**Operation**
Montana	Pipeline ROW	3,784.42	1,727.75
	Additional Temporary Workspace Areas	518.64	0.00
	Pipe Stockpile Sites, and Contractor Yards	517.28	0.00
	Construction Camp	242.88	0.00
	Pump Stations and Delivery Facilities	65.79	65.79
	Access Roads	337.03	47.41
	Rail Sidings[a] (3 Sites)	60.00	0.00
	Montana Subtotal	5,526.05	1,840.95
South Dakota	Pipeline ROW	4,153.37	1,906.83
	Additional Temporary Workspace Areas	460.37	0.00
	Pipe Stockpile Sites, and Contractor Yards	605.07	0.00
	Construction Camp	250.04	0.00
	Pump Stations and Delivery Facilities[b]	65.63	65.63
	Access Roads	222.96	24.34
	Rail Sidings[a] (3 Sites)	60.00	0.00
	South Dakota Subtotal	5,817.44	1,996.80
North Dakota	Pipeline ROW	0.00	0.00
	Additional Temporary Workspace Areas	0.00	0.00

		Lands Affected (Acres)	
State	**Facility**	**Construction**	**Operation**
	Pipe Stockpile Sites, and Contractor Yards	56.05	0.00
	Construction Camp	0.00	0.00
	Pump Stations and Delivery Facilities[b]	0.00	0.00
	Access Roads	0.00	0.00
	North Dakota Subtotal	56.05	0.00
Nebraska	Pipeline ROW	3,637.41	1,663.68
	Additional Temporary Workspace Areas	226.88	0.00
	Pipe Stockpile Sites, and Contractor Yards[c]	680.00	0.00
	Construction Camp[c]	80.00	0.00
	Pump Stations and Delivery Facilities[b]	67.12	67.12
	Access Roads	70.50	0.00
	Rail Sidings[a]	100.00	0.00
	Nebraska Subtotal	4,001.91	1,730.80
Kansas	Pipeline ROW	0.00	0.00
	Additional Temporary Workspace Areas	0.00	0.00
	Pipe Stockpile Sites, and Contractor Yards	0.00	0.00
	Construction Camp	0.00	0.00
	Pump Stations and Delivery Facilities[b]	15.15	15.15
	Access Roads	0.00	0.00
	Rail Sidings[a]	0.00	0.00
	Kansas Subtotal	15.15	15.15
Total =		**16,277.60**	**5,583.78**

[a] Rail siding acreage represents 20 acres for each site. Total acreage for rail sidings = 140 acres.

[b] Pump station acreages are a nominal number set at 15 acres. Except PS-26, actual acreage was used (7.12 acres).

[c] These are estimated acreages; locations have not been finalized at this time.

Table 4. Locations and acreages of pipe storage sites, railroad sidings, and proposed contractor yards.

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
Montana	Dawson, McCone, Valley, Fallon	Contractor Yards	5	161
	Roosevelt, Sheridan, Prairie	Rail Sidings[a]	3	60
	Phillips, Dawson, McCone, Valley, Fallon	Pipe Yard Stockpile Sites	9	283
South Dakota	Tripp, Haakon, Jones	Contractor Yards	7	258

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
	Hughes, Lyman, Pennington	Rail Sidings[a]	3	60
	Tripp, Haakon, Jones	Pipe Yard Stockpile Sites	11	347
North Dakota	Bowman	Pipe Yard Stockpile Sites	1	56
Nebraska	Fillmore, Greeley, Holt, Jefferson, Merrick, York	Contractor Yards	8	233
	Butler, Hamilton, Holt, Jefferson, Valley	Rail Sidings	5	100
	Antelope, Boone, Fillmore, Hamilton, Holt, Jefferson, Keya Paha, Nance	Pipe Yard Stockpile Sites	11	447
Kansas	NA	NA	NA	NA
		TOTAL		1,805

[a] Nominal Acreage of 20 acres each assigned to rail sidings.

The total acreage for the seven camps planned in Montana and South Dakota for which acreage is known equals 493 acres. Keystone is also proposing and investigating the possibility of building a temporary construction camp at a suitable location in Holt County in northern Nebraska, which would be an additional 80 acres raising the total amount to 573 acres. Camp decommissioning 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) (Appendix B, DOS 2012).

Table 5. Locations and acreages of proposed construction camps.

State	County	Type(s) of Yards	Number of Yards	Combined Acreage
Montana	McCone, Valley (2), Fallon	Contractor Camps	4	243[1]
South Dakota	Tripp, Harding, Meade	Contractor Camps	3	250
North Dakota	NA	NA	NA	NA
Nebraska	Holt	Contractor Camp	1	80
Kansas	NA	NA	NA	NA
		TOTAL		573

[a] Additional camp in Valley County has not yet been sited, acreage TBD.

Access Roads

The proposed Project would use public and existing private roads to provide access to most of the construction ROW (DOS 2012). Approximately 191 temporary access roads would be needed to provide adequate access to the construction sites. Private roads and any new temporary access roads would be used and maintained only with permission of the landowner or the appropriate land management agency. Temporary and permanent disturbance estimates for access roads 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.

Aboveground Facilities

The proposed Project would require approximately 286 acres of land, other than permanent ROW, along the proposed Project segments for aboveground facilities, including pump stations, densitometer sites, intermediate MLVs, and delivery facilities (see Table 3) (DOS 2012).

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 (approximately 33 feet in height), 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. Power lines would need to be constructed by local power providers to provide electrical service to pumping stations (Table 6)

Table 6. Summary of power supply requirements for the Keystone XL Pump Stations

Pump Station Number	Approximate Milepost	Transformer Size (MVA)	Utility Supply (kV)	Length (miles)	Power Provider
Montana					
PS-09	1.2	20/27/33	115	61.8	Big Flat Electric Cooperative
PS-10	49.3	20/27/33	115	49.1	NorVal Electric Cooperative
PS-11	99	20/27/33	230	0.2	NorVal Electric Cooperative
PS-12	151.5	20/27/33	115	3.2	McCone Electric Cooperative
PS-13	203.1	20/27/33	115	15.2	Tongue River Electric Cooperative
PS-14	239.5	20/27/33	115	6.3	Montana-Dakota Utilities Company
South Dakota					
PS-15	288.6	20/27/33	115	24.5	Grand Electric Cooperative
PS-16	337.3	20/27/33	115	40.1	Grand Electric Cooperative
PS-17	391.5	20/27/33	115	10.9	Grand Electric Cooperative

Pump Station Number	Approximate Milepost	Transformer Size (MVA)	Utility Supply (kV)	Length (miles)	Power Provider
PS-18	444.6	20/27/33	115	25.9	West Central Electric Cooperative
PS-19	500.4	20/27/33	115	20.4	West Central Electric Cooperative
PS-20	550.9	20/27/33	115	17.2	Rosebud Electric Cooperative
PS-21	598.9	20/27/33	115	20.1	Rosebud Electric Cooperative
Nebraska					
PS-22	653.6	20/27/33	115	24	Nebraska Public Power District (NPPD) & Niobrara Valley Electric
PS-23	708.2	20/27/33	115	36	NPPD & Loup Valleys Rural PPD
PS-24	765	20/27/33	115	9	NPPD & Southern Power District
PS-25	818.4	20/27/33	69	1.0	Perennial PPD
PS-26	875.3	20/27/33	115	0.5	NPPD & Norris PPD
Kansas					
PS-27	49	20/27/33	115	4.6	Clay Center Public Utility
PS-29	144.5	20/27/33	115	8.9	Westar Energy

MVA = megavolt-amperes (million volt-amperes), kV = kilovolt.

Note: Mile posting for each segment of the proposed Project starts at 0.0 at the northernmost point of each segment and increases in the direction of oil flow.

Mainline Valves

Keystone proposes to construct 44 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 impacts in the event of a spill.

Restoration

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. 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. Preliminary cleanup would be completed within approximately 20 days after the completion of backfilling assuming appropriate weather conditions prevail (approximately 10 days in residential areas). 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. 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 NRCS recommendations. On agricultural lands, seeding would be conducted only as agreed upon with the landowner. 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. Once operation begins, Keystone is required to monitor the pipeline at least 26 times per year at intervals not to exceed three weeks for revegetation following construction disturbance, erosion, other human activities occurring near the pipeline, and potential leaks. 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 re-established would be revegetated by Keystone or Keystone would compensate the landowner for reseeding.

Waterbody Crossings

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 hydraulic directional drilling (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 professional judgment of the qualified design personnel.

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 USACE and other relevant regulatory agencies, as well as additional conditions that may be imposed by landowners or land managers at the crossing location.

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 Countermeasures Plan (SPCCP) to address the handling of fuel and other hazardous materials (DOS 2012, Appendix D). The purpose of the SPCCP is to establish procedures to prevent the discharge of hazardous or regulated materials during construction of the proposed Project. The SPCCP 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 and Project permits, and to protect human health and the environment (DOS 2012, Appendix D).

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.

Wetland Crossings

Data from wetland delineation field surveys, aerial photography, and National Wetland Inventory maps were used by Keystone 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. The directional drilling technique may be considered in certain site-specific wetland conditions due to the presence of special-status plant or wildlife species or other factors and will be determined during the Clean Water Act Section 404 permitting process in consultation with the appropriate state USFWS Ecological Services Field 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. 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.

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.

Decommissioning

The Pipeline Hazardous Material Safety Administration (PHMSA) has requirements that apply to decommissioning crude oil pipelines in 49 C.F.R. §§ 195.402(c) (10), 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 C.F.R. § 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 with PHMSA 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 will adopt operating procedures to address these requirements for the proposed Project as they have for previous pipeline projects including the existing Keystone Pipeline mainline. TransCanada 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 (a measure used to prevent corrosion by causing a metallic structure, such as a pipeline, to act as a cathode) would be left functional as would other integrity measures such as periodic inspections under the integrity management plan. Prior to decommissioning the proposed Project, 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 impacts of implementing the decommissioning procedures and identify the mitigation measures required to avoid or minimize impacts.

Normal Operations

Keystone would develop and implement an annual Pipeline Maintenance Program (PMP) to ensure the integrity of the pipeline. The PMP would include valve maintenance, periodic inline inspection, and a cathodic protection program to ensure pipeline reliability. Data collected in each year of the program would be fed back into the decision-making process for the development of the following year's program (DOS 2012). The Project Operation Control Center (OCC) would be manned by experienced and highly trained personnel 24 hours per day, every day of the year in Calgary. In addition, a fully redundant backup OCC would be constructed, operated, and maintained, also in Canada. Primary and backup communications systems would provide real-time information from the pump stations to the OCC (DOS 2012). The control center would have highly sophisticated pipeline monitoring systems including multiple leak detection systems capable of identifying abnormal conditions and initiating visual and audible alarms. Automatic shut-down systems would be initiated if a valve starts to shut and all pumps upstream would turn off automatically.

The proposed Project would include a supervisory control and data acquisition (SCADA) system to constantly monitor the pipeline system (DOS 2012). The SCADA system would be installed and operated in accordance with the requirements of 49 C.F.R. § 195 and PHMSA. The SCADA facilities would be located in the OCC and along the pipeline system, and all pump stations and delivery facilities would have communication software that sends data back to the OCC. The pipeline SCADA system would allow the OCC to remotely read intermediate MLV positions, tank levels, and delivery flow and total volume. The OCC personnel would also be able to start and stop pump stations and open and close automated MLVs.

The pipeline ROW would be inspected via aerial and ground surveillance to provide prompt identification of possible encroachments or nearby construction activities, ROW erosion, exposed pipe, or any other conditions that could result in damage to the pipeline. The aerial surveillance of the pipeline ROW must be carried out at least 26 times per year and the interval between surveillance cannot exceed 3 weeks as required by 49 C.F.R. § 195.412. Landowners would be encouraged to report any pipeline integrity concerns to Keystone or to PHMSA. Intermediate MLVs and MLVs at pump stations would also be inspected. As required by 49 C.F.R. § 195.420(b), they would be inspected at intervals not to exceed 7.5 months but at least twice each calendar year (DOS 2012).

Routine Maintenance

Routine maintenance would include 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.

If Keystone would need to repair or replace a portion of the proposed pipeline or replace aboveground facilities in the ROW, appropriate agencies would be consulted 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 impacts in accordance with the Spill Prevention Control and Countermeasures Plan. Impacts to natural resources could be covered under a Natural Resource Damage Assessment conducted by the trustees, including the USFWS and other agencies.

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.

Conservation Measures

Conservation measures are actions that benefit or promote the recovery of listed species that are included by the Department as an integral part of the proposed Project. Conservation measures also have been identified below that would contribute to the conservation of the greater sage-grouse and Sprague's pipit. All of these conservation measures will be implemented by the applicant or power providers where specified, and serve to avoid, minimize, or compensate for Project effects on the species under review thereby supporting concurrence by the USFWS of a NLAA for all of the following species except the ABB and candidate species. General conservation measures applicable to all species are listed below followed by species-specific conservation measures for the species under consideration in this BO.

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 (DOS 2012, Appendix D).
- 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 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.

Black-footed Ferret

Keystone or power providers where specified have committed to incorporating the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the black-footed ferret from construction in Montana. The USFWS believes that there is no suitable habitat for the species along the proposed Project; however, the following measures have been adopted in the event that a black-footed ferret is detected:

- Provide USFWS with the results of the 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's Black-footed Ferret Survey Guidelines (USFWS 1989).
- Complete surveys to identify prairie dog colonies in Fallon County, Montana consistent with the Final EIS to determine if any Category 3 colonies or complexes occur and could be avoided.
- 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 diseases are spread (domestic pets and fleas).
- Workers will not be allowed to feed wildlife.
- Concentrations of dead and/or apparently diseased animals (e.g., prairie dogs, ground squirrels, others) would be reported to the appropriate state and federal agencies.
- Pump Station 9 (Montana): Big Flat Electric Cooperative will provide immediate notification to the USFWS in the unlikely event that a black-footed ferret is sighted during the course of power line construction.

Interior Least Tern

Keystone or power providers where specified have committed to incorporating the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the interior least tern:

- 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 0.25-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 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.

Whooping Crane

Keystone or power providers where specified have committed to incorporate the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the whooping crane:

- 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 and applied to all projects when located near whooping crane habitat (USFWS 2012b) (Appendix F). 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 (APLIC 2012). 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 ¼ 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 (found in Appendix F) 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.

Pallid sturgeon

Keystone or power providers where specified have committed to incorporating the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the pallid sturgeon:

- Keystone will use HDD to cross the Missouri, Yellowstone, and Milk rivers where pallid sturgeons are known to occur.
- Keystone will ensure that HDD boring will result in a burial depth of 25 feet or greater below the river bed in the Missouri, Yellowstone, and Milk rivers.
- Keystone will ensure that the intake end of the pump will be screened to prevent entrainment of larval fish or debris and the intake screens will be periodically checked for fish entrainment when pumping from the Missouri, Yellowstone, and Milk rivers in Montana. Mesh size of the screen will be 0.125-inch and have an intake velocity of less than 0.5 foot/second to avoid larval entrainment and juvenile fish impingement and entrapment. Should a sturgeon become entrained, impinged, or entrapped all pumping operations will immediately cease and the compliance manager for Keystone would immediately contact the USFWS to determine if additional protection measures would be required. The conservation measure is in effect for pumping operations including HDD and hydrostatic testing.
- Keystone will maintain at least a 100-foot setback from the water's edge for the HDD drill pads at the HDD crossings on the Yellowstone, Missouri, and Milk rivers in Montana.
- Pump Station 10 (Montana): NorVal Electric Cooperative will not cross the Milk River with equipment. No disturbances will occur along the river banks or its associated vegetation where the power line crossing would occur.

American Burying Beetle

Keystone or power providers where specified have committed to incorporate the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the ABB:

- Construction camp near Winner, South Dakota will be built on agricultural land in coordination with USFWS.
- Two pipe stockpile sites planned for Tripp County will be placed on agricultural land in coordination with USFWS.
- When working in suitable ABB habitat in Tripp, Keya Paha, and Holt counties, all parking and staging areas will be pre-located within the approved construction footprint.
- Vehicle traffic used in support of preconstruction activities will be confined to approved access roads.
- Construction methods will be used involving sequential replacement of topsoil and re-establishment of natural vegetation to restore natural soil hydrology within the construction ROW and avoid long-term impacts to ABB habitat.
- Prior to construction disturbance and grading for the ROW, capture and relocation of ABB will be implemented only in Nebraska where access is available to remove adult beetles from the construction ROW in accordance with the Nebraska ABB Trapping Protocol (USFWS and NGPC 2008; Appendix K, American Burying Beetle Trapping Protocol and Conservation Measures for Use in Nebraska). Capture and relocation of ABB is not authorized in South Dakota.
- Protective measures at the relocation site such as creating a tunnel in moist soil for each released ABB with a light cover (e.g., a leaf), and not releasing more than 50 ABB at any one site will be implemented to increase the survivability of relocated ABB.
- Mowing and windrowing vegetation will be conducted after the capture and relocation period to temporarily reduce habitat suitability by drying out the soil surface if construction is not planned to be started prior to the next capture and relocate window. Windrowing, which refers to removal of mowed vegetation from an area to avoid accumulation of grass clippings on the soil surface, will be done to remove vegetation residue. Mowing will be done so that vegetation is at most 8 inches in height. Mowing and windrowing will be implemented only in Nebraska. Mowing and windrowing cannot be used in South Dakota as an avoidance and minimization measure because of concerns there about habitat loss for other species, including grassland birds.
- After the capture and relocation efforts are completed, the ROW will be disturbed (graded) prior to the next June ABB active period in Nebraska (e.g., capture and relocate efforts take place during the August active period, and the ROW disturbance would take place prior to the following June active period). June and August active periods are times when ABB are active and above ground. Adult, reproductive ABB are active and above ground in June; adult and offspring ABB are active and above ground in August.

- In areas where the ROW could not be disturbed (graded) before the next activity period, capture and relocation efforts will be repeated in Nebraska (e.g., capture and relocation efforts would be repeated during the June active period, and the ROW would be disturbed prior to the August active period).
- After capture and relocation efforts are completed in Nebraska, a biologist from Keystone will travel the ROW every couple of days during the ABB active period (June through September) to remove any carcasses that may be present within the ROW that may otherwise be attractive to the ABB.
- Keystone will train all workers operating in ABB habitat and would include discussion of habitat, biology, reasons for their decline, and responsibilities of all workers for the protection of the species (including removing food wastes from the ROW each day, reporting any ABB sightings to an environmental inspector, and avoiding bringing dogs and cats to the ROW). Keystone will produce a full color Endangered Species Card with a picture of the ABB and all of this information summarized on the card. The card will be handed out to all construction workers operating in ABB habitat.
- Signs will be posted at all access points to the ROW highlighting the areas as ABB habitat and reminding workers to follow special restrictions in the area.
- Keystone will down-shield lighting and install sodium vapor-type lights or equivalent in coordination with USFWS in instances when construction activities would occur in suitable habitat areas in Keya Paha, Holt, and Tripp counties to avoid attracting the species to the construction site. Keystone will down-shield lighting and install sodium vapor-type lights or equivalent in coordination with USFWS at ancillary facilities within areas occupied by the ABB.
- Keystone will provide compensation for temporary construction and permanent operations impacts to the ABB as part of a Habitat Conservation Trust (ABB Trust) in areas where the species is likely to be impacted including: southwest of Highway 18 in Tripp County, South Dakota and west of Highway 281 in Keya Paha and Holt counties in Nebraska. The Habitat Conservation Trust would be managed by a nongovernment organization experienced in the management of funds for habitat projects. Funds would be used to acquire land though purchase by fee title or through perpetual conservation easements. Funds could also be used for habitat restoration projects. Compensation would be based on total acres impacted where ABB presence was confirmed in Nebraska (see Appendix D for calculation method). Compensation would be calculated based on total acres impacted and would be modified by habitat quality rating multipliers with prime habitat compensation at 3 times the total impact acres; good habitat at 2 times the total impact acres; fair habitat at 1 times the total impact acres; and marginal habitat at 0.5 times the total impact acres. No compensation would be provided for poor habitat. In Nebraska only, no compensation would be provided for habitat where ABB have not been found.
- In South Dakota, compensation will be provided based only on habitat quality rating multipliers and not ABB survey information. Temporary habitat impacts will be scaled for the period of time anticipated for recovery of vegetation cover at 4 years over the 50-year life of the proposed Project or 8 percent of total calculated impacts. All compensation would be based on habitat ratings and compliant with agreements between the Department, USFWS, and Keystone.

- Keystone will provide funding for compliance monitoring upon issuance of a Presidential Permit and prior to initiating Project construction in South Dakota and Nebraska. The Department will designate USFWS or an agreed-upon qualified third-party that would work with USFWS to ensure that vegetation restoration efforts were successful for ABB habitat, as agreed between the Department, USFWS, and Keystone.
- Keystone will reseed disturbed areas in prime, good, fair, and marginal ABB habitats with a seed mix that corresponds to the appropriate Construction/Reclamation (Con/Rec) unit for that property. Reclamation measure and seed mixes for each Con/Rec are provided in Appendix R of the Supplemental DEIS. Should a landowner-directed seed mix be determined to not result in full restoration as stipulated in the Reclamation Performance Bond then the subject acreage amount reseeded will be debited from temporary ABB habitat impacts and credited to permanent ABB habitat impacts and the total donation amount to the ABB Trust will be recalculated.
- Keystone will set aside funds for a restoration performance bond (see Appendix E for calculation method) upon issuance of a Presidential Permit and prior to initiating Project construction in South Dakota and Nebraska. The bond would be applied to supplemental vegetation restoration that could be necessary if restoration for ABB beetle habitat failed, as agreed between the Department, USFWS, and Keystone.
- Pump Station 22 (Nebraska): The Nebraska Public Power District will schedule line construction activities for this line segment for during the ABB dormant or inactive time in the winter when soil would be frozen to avoid soil compaction (September 15 to April 1). The Nebraska Public Power District will coordinate with USFWS and NGPC to determine appropriate measures to minimize potential impacts if such scheduling cannot be accomplished due to unexpected circumstances, including weather delays.

Piping Plover

Keystone or power providers where specified have committed to incorporating the following conservation measures as part of the proposed Project to prevent potential direct or indirect impacts to the piping plover:

- 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 0.25-mile buffer of no construction activity and 2) continue to monitor nests if any are within 0.25-mile 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.

Western Prairie Fringed Orchid

Keystone or power providers where specified have committed to implementation of the following conservation measures for the western prairie fringed orchid where suitable habitat is present. Habitat suitability surveys will be done by a person who has demonstrated qualifications in completing surveys and is knowledgeable about the habitat requirements for the species. The person selected to conduct surveys will submit documentation of survey qualifications to the USFWS for review and approval.

- Complete habitat suitability surveys prior to construction. Survey results will be submitted to the USFWS for review.
- Keystone will re-route the pipeline around individual plants or populations within the proposed Project footprint to the extent practicable and/or allowed by the landowner. Compensation through a Habitat Conservation Trust will be provided in areas that cannot be avoided.
- Keystone will transplant individual plants that would be affected by construction activities to other locations where suitable habitat is available, when feasible and/or when approved by the land owner if on private land. This action will be done in coordination with USFWS.

- Keystone will reduce the width of the construction ROW, the amount of reduction dependent on the circumstances, in areas where orchid populations have been identified. This will be done in coordination with USFWS.
- 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 provide compensation for suitable western prairie fringed orchid habitat in a Habitat Conservation Trust. Areas along the proposed Project where the species is likely to occur include: southwest of Highway 18 in Tripp County, South Dakota and Keya Paha, Holt, Rock, Antelope, and Boone counties in Nebraska. The Habitat Conservation Trust would be managed by a nongovernment organization experienced in the management of funds for habitat projects. Funds would be used to acquire land though purchase by fee title or through perpetual conservation easements. Funds could also be used for habitat restoration projects. Compensation will be based on total acres impacted where suitable western prairie fringed orchid habitat is present regardless of presence/absence survey results. Habitat surveys will be used to evaluate western prairie fringed orchid habitat. Compensation would be calculated based on total acres impacted multiplied by 31 percent, the probability of encountering a western prairie fringed orchid during the course of survey work (NGPC 2013) (see Appendix G for calculation method). A 3:1 habitat mitigation ratio would be applied to the habitat expected to contain WPFO to offset temporal loss of habitat from between the time construction began to the time orchid habitat is fully restored and that figure would be multiplied by the value of an acre of land (Appendix G).
- Keystone will restore and monitor construction-related impacts to wet meadow habitats identified as suitable for the western prairie fringed orchid consistent with USACE guidelines as follows. The disturbed areas shall be reseeded concurrent with the project or immediately upon completion. Revegetation shall be acceptable when ground cover of desirable species reaches 75%. If this seeding cannot be accomplished by September 15 the year of project completion, then an erosion blanket shall be placed on the disturbed areas. The erosion blanket shall remain in place until ground cover of desirable species reaches 75%. If the seeding can be accomplished by September 15, all seeded areas shall be properly mulched to prevent additional erosion.
- Pump Station 22, 23, 24 (Nebraska): The Nebraska Public Power District will complete field surveys for the western prairie fringed orchid during the appropriate bloom periods only in areas along the final line routes that are considered suitable. The Nebraska Public Power District will delineate and mark areas where western prairie fringed orchid habitat is present as "avoidance areas" where placement of structures and construction traffic will not occur.

Greater Sage-Grouse

The Department has coordinated with the USFWS, BLM, MFWP, and the SDGFP to consider the effects of the proposed Project on the greater sage-grouse, including the effects of habitat fragmentation. Several conservation measures would be implemented by Keystone or power providers where specified to avoid, minimize, and compensate for impacts to the sage-grouse. Many of these were described in *An Approach for Implementing Mitigation Measures to Minimize*

the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse (DOS 2012, Appendix O) and *An Approach for Implementing Mitigation Measures to Minimize the Effects of Construction and Operation of the Keystone XL Pipeline Project on Greater Sage-Grouse in South Dakota; and Associated Correspondences* (DOS 2012, Appendix P). In South Dakota, this strategy was supplemented with compensatory mitigation that was outlined in a proposal submitted to SDGFP in November 2011 and revised in November 2012 (DOS 2012, Appendix P). Those measures include the following:

- Surveys will be conducted for greater sage-grouse leks prior to construction using approved methods to determine lek locations and peak number of males in attendance within 3 miles of the facility unless the facility is screened by topography; also surveys will be done for leks as identified by MFWP, BLM, and SDGFP more than 3 miles from the facility for use as a baseline to determine construction effects on sage-grouse abundance.
- A conservation plan will be developed with MFWP, SDGFP, USFWS, and BLM once the Presidential Permit is signed and before Project construction begins in Montana and South Dakota to address impacts to greater sage-grouse, including construction timing restrictions, habitat enhancement, and any mitigation measures that would be necessary to maintain the integrity of Core Areas or Preliminary Priority Habitat/Protection Priority Areas (USFWS 2012b), which encompasses lek habitats as well as other important habitat necessary for greater sage-grouse to meet life requisites (see DOS 2012: Appendices O and P, Sage Grouse Mitigation Plans).
- Protection and mitigation efforts will be followed as identified by MFWP, SDGFP, and USFWS including identification of all greater sage-grouse leks within the buffer distances from the construction ROW set forth for the greater sage-grouse by USFWS, and avoiding or restricting construction activities as specified by USFWS within buffer zones between March 1 and June 15 (see DOS 2012: Appendices O and P, Sage Grouse Mitigation Plans) unless the facility is screened by topography.
- Construction will be prohibited during March 1 to June 15 within 3 miles of active greater sage-grouse leks in suitable nesting habitat not screened by topography, with an allowance made for one-time equipment movement during mid-day hours through ROW areas with a timing restriction that does not require grading for equipment passage to lessen disturbance to sage-grouse leks.
- Construction within 2 miles of active greater sage-grouse leks on federal land will be prohibited from March 1 to June 15.
- The mound left over the trench in areas where settling would not present a path for funneling runoff down slopes in sagebrush habitat will be reduced, and additional measures would be taken to compact backfilled spoils to reduce settling to avoid funneling runoff down slopes.
- A compensatory mitigation fund for use by MDEQ, MFWP, and BLM will be established to enhance and preserve sagebrush communities for greater sage-grouse and other sagebrush-obligate species in eastern Montana (size of the fund to be based on acreage of silver sagebrush and Wyoming big sagebrush habitat disturbed during pipeline construction within sage-grouse core habitat mapped by MFWP and important habitat between approximate Mileposts 95 to 98 and 100 to 121).

- Inspection over-flights will be limited to afternoons from March 1 to June 15 during operations as practicable in sagebrush habitat designated by MFWP.
- A 4-year study will be funded by Keystone, under the direction of MDEQ, MFWP, and BLM, that would show whether the presence of the facility has affected greater sage-grouse numbers based on the peak number of male sage-grouse in attendance at leks.
- Restoration measures (i.e., application of mulch or compaction of soil after broadcast seeding, and reduced seeding rates for non-native grasses and forbs) will be implemented immediately following construction 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.
- Studies will be conducted by Keystone prior to construction along the route to identify areas that support stands of silver sagebrush and big sagebrush. This information will be incorporated into restoration activities to prioritize reestablishment of sagebrush communities.
- Establishment of sagebrush on reclaimed areas will be monitored and reported-on, unless otherwise requested by the landowner, annually for at least 4 years to ensure that sagebrush plants become established at densities similar to densities in adjacent sagebrush communities. Additional sagebrush seeding or planting will be implemented, if necessary.
- Criteria will be established in conjunction with MDEQ, MFWP, and BLM to determine when restoration of sagebrush communities has been successful based on pre- and post-construction studies in addition to consideration of revegetation standards.
- Locally adapted sagebrush seed will be used by Keystone for land restoration (collected within 100 miles of the areas to be reclaimed), unless otherwise requested by the effected landowner (seed would be collected as close to the Project as practicable as determined by regional seed production and availability).
- Cover and densities of native forbs and perennial grasses will be monitored exclusive of noxious weeds on reclaimed areas and reseeded with native forbs and grasses where densities are not comparable to adjacent communities.
- Keystone will work in conjunction with the landowner to appropriately manage livestock grazing of reclaimed areas until successful restoration of sagebrush communities has been achieved (livestock grazing in restored sagebrush communities may promote establishment of sagebrush).
- Measures will be implemented to reduce or eliminate colonization of reclaimed areas by noxious weeds and invasive annual grasses such as cheatgrass to the extent that these plants do not exist in undisturbed areas adjacent to the ROW (noxious weed management plans would be developed and reviewed by appropriate county weed specialists and land management agencies for each state crossed by the proposed Project).
- A compensatory mitigation fund will be established by Keystone, in consultation with SDGFP, and managed by a third party for temporary and permanent impacts to greater sage-grouse habitat. The fund will be used by SDGFP to enhance and preserve sagebrush communities within the sagebrush ecosystem in South Dakota, which is found within the

following counties: Butte, Custer, Fall River, and Harding counties and to a lesser degree, Perkins and Meade counties.

- A research fund will be developed by Keystone, in consultation with SDGFP, and managed by a third party to evaluate the effects of pipeline construction on greater sage-grouse.
- Leks will be monitored that are within 3 miles of the Project footprint in South Dakota that are within the view shed of the construction ROW if construction takes place between March 1 and June 15.
- Keystone will implement, in consultation with SDGFP, a modified 3-mile buffer from March 1 to June 15 around active greater sage-grouse leks. The buffer would be modified on a lek-by-lek basis to account for differences in topography, habitat, existing land uses, proximity of the Project to the lek, and line-of-sight between the proposed Project and each lek.
- Construction equipment activity will be restricted in South Dakota to occur only between 10 am and 2 pm to avoid impacts to breeding greater sage-grouse from March 1 through June 15 in areas where a lek is either within 3 miles of the ROW and visible from the ROW or within 1-mile of the ROW and not visible from the Project ROW.
- Pump Station 9 (Montana): Big Flat Electric Cooperative will implement mitigation measures in accordance with APLIC standards (APLIC 2012) and in coordination with the USFWS, BLM, and MFWP to avoid and minimize impacts to the greater sage-grouse. Construction of the power line will be avoided from March 1 through June 15 to avoid impacts to greater sage-grouse leks that are near the power line.

  Big Flat Electric Cooperative will also require its contractors to install a pole top raptor guard on 68 poles identified to be close enough to a lek to provide a perch and visibility of the lek for birds of prey. Pole top raptor guards will also be installed on 24 existing distribution poles to protect a long-established lek located near the new transmission line project to provide service to pump station 9. Additional pole top raptor guards may be installed pending further field assessments completed during construction.

  Big Flat Electric Cooperative will ensure reclamation of disturbed areas that favors establishment of silver sagebrush (big sagebrush is not located north of the Milk River) and other species that encourage development of suitable greater sage-grouse habitat. Only BLM-approved seed sources will be used in reclamation efforts on BLM lands.

- Pump Station 13 (Montana): Tongue River Electric Cooperative has sited the 15.3-mile long power line so that it is located in developed areas near the transportation infrastructure or agricultural land thereby avoiding areas of potential habitat.

- Pump Station 14 (Montana): Montana Dakota Utilities will reroute a portion of the transmission line serving pump station 14 to avoid two sage-grouse leks and install raptor perch guards at structures previously identified by the MFWP.

  Montana Dakota Utilities will work with TransCanada to avoid any construction of the transmission line from March 1 through June 15, if possible. If not possible, Montana Dakota Utilities 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 and monitor active leks (displaying males) within 3 miles of the Project during construction from March 1 through June 15. Montana Dakota Utilities would contact the USFWS to obtain additional guidance if construction-related disturbance of lekking sage grouse is noted.

- Pump Stations 15, 16, and 17 (South Dakota): Grand Electric Cooperative will install raptor perch deterrents (cones or spike type deterrent devices) at any power pole that is located one-mile or less from a greater sage-grouse lek for the power line alignments to pump stations 15, 16, and 17. Selection of poles to be equipped with perch deterrent devices will be done in coordination with the USFWS.

Sprague's Pipit

Conservation measures have been discussed with multiple agencies and would be implemented by Keystone or power providers where specified to avoid, minimize, and compensate for impacts to the Sprague's pipit as outlined below:

- Disturbed areas in native range will be seeded with a native seed mix after topsoil replacement.
- The Project ROW will be monitored to determine the success of revegetation after the first growing season, and areas will be reseeded where vegetation has not been successfully reestablished.
- Off-road vehicle access to the Project ROW will be controlled with the use of signs; fences with locking gates; slash and timber barriers, pipe barriers, boulders lined across the construction ROW; or planted conifers or other appropriate trees or shrubs in accordance with landowner or manager request.
- A conservation plan will be developed for the proposed Project to comply with the Migratory Bird Treaty Act and implement provisions of Exec. Order No. 13,186 by providing benefits to migratory birds and their habitats within the states where the proposed Project would be constructed, operated, and maintained.
- If construction would occur during the April 15 to July 15, the grassland ground-nesting bird nesting season, Keystone will ensure that nest-drag surveys are completed to determine the presence or absence of nests on federal land in eastern Montana.
- Construction activity will be delayed from April 15 to July 15 within 330 feet of discovered active nests in eastern Montana.
- Pump Station 9 (Montana): Big Flat Electric Cooperative will implement mitigation measures in coordination with the USFWS, BLM, and MFWP to avoid and minimize impacts to the Sprague's pipit. Preconstruction surveys for the species will be coordinated with the USFWS. Unauthorized vehicle access will be restricted by Big Flat Electric Cooperative during the course of project construction to avoid impacts to nesting birds. Big Flat Electric Cooperative will ensure that disturbed areas will be reseeded to encourage redevelopment of native range using a BLM-approved seed mix.

- Pump Station 12 (Montana): McCone Electric Cooperative will site the power line to avoid and minimize encroachment on native prairie habitats. Construction activities will occur outside of the April 15 through July 15 nesting season, if possible. If Sprague's pipit nests are discovered, construction activity will be delayed within 330 feet of the nest, until the young have fledged. McCone Electric Cooperative will ensure all areas disturbed during the course of power line construction are reseeded with a native seed mix after top soil replacement. Access to the power line ROW will be controlled via fences with locking gates, signs, and fences to avoid disturbance to nesting areas.

- Pump Station 14 (Montana): Montana Dakota Utilities will mow the ROW, unless the landowner does not approve mowing. Any mowing would be done in the fall, prior to construction, to discourage bird nesting. Montana Dakota Utilities may decide not to mow the ROW if construction is projected to commence after July 15. Sagebrush will not be mowed.

  Montana Dakota Utilities will work with TransCanada to avoid construction of the transmission line from April 15 through July 15, if possible. If construction is projected to occur in native prairie habitat during the period from April 15 through July 15, Montana Dakota Utilities will mow the ROW unless the landowner does not approve mowing. Any mowing would be done in the fall, prior to construction, to discourage bird nesting. Montana Dakota Utilities may decide not to mow the ROW if construction is projected to commence after July 15. Sagebrush will not be mowed.

Interrelated and Interdependent Actions

Interrelated actions are those actions that are a part of a larger action and depend on the larger action for their justification (50 CFR § 402.02). Interdependent actions are those actions having no independent utility apart from the proposed action (50 CFR § 402.02). The USFWS and the Department have identified three interrelated and interdependent actions. The effects of these actions are discussed in the *Effects of the Action* section of this BO. The interrelated and interdependent actions include the following:

- Electrical distribution lines and substations that would provide electrical service to pipeline pump stations;
- the Big Bend to Witten 230-kilovolt (kV) transmission line (necessary in southern South Dakota for future increase in pipeline through-put;
- The Bakken Marketlink Project near Baker, Montana.

Electrical Substations and Power Distribution Lines to Pump Stations (Montana, South Dakota, Nebraska, and Kansas)

At least 20 separate private power districts or cooperatives would construct transmission lines to deliver power to 20 pump stations located along the United States length of the pipeline from Montana to Nebraska (Table 6) (see Appendix A). The power lines needed to service pipeline pump stations would range in capacity from 69 kV to 240 kV, but the majority would have a capacity of 115 kV. Most of the lines would be strung on single pole and/or H-frame wood poles, and would typically be about 60 to 80 feet high with wire span distances from approximately 250

to 400 feet. The length of the power lines vary. Potential effects of these substations and power distribution lines are addressed in the *Effects of the Action* section in this BO.

Big Bend to Witten 230-kV Transmission Line (South Dakota)

After receipt of information on the power requirements for the proposed pump stations in South Dakota, Western conducted a joint system engineering study to determine system reliability under the proposed loads at full Project electrical energy consumption. Engineering studies determined that a 230-kV transmission line would be required to support voltage requirements for pump stations 20 and 21 in the Witten area when the proposed Project is operating at maximum capacity. To address this requirement, Western proposes to replace the existing Big Bend-Fort Thompson No. 2 230-kV Transmission Line Turning Structure located on the south side of the dam, construct a new double circuit 230-kV transmission line for approximately 1 mile south west of the dam, and construct a new Lower Brule Substation. These actions are part of the larger Big Bend to Witten 230-kV Transmission Line Project.

If a Presidential Permit is issued, Western plans to construct approximately 2.1 miles of new double-circuit transmission line from the Big Bend Dam, located near the town of Fort Thompson, South Dakota, south to a new substation, tentatively named Big Bend Substation, which would also be constructed by Western. The new 2.1-mile, 230 kV transmission line would be constructed, owned, and operated by Western, but the Big Bend Substation would be transferred after construction to the Basin Electric Power Cooperative (BEPC), which would then own and operate it. The BEPC proposes to construct, own, and operate a new 72.9-mile-long 230 kV transmission line from the proposed new Big Bend Substation to the existing Witten Substation, located near the town of Witten in Tripp County. The new Big Bend Substation and approximately 75-mile-long 230 kV transmission line would assure future electric power requirements at pump stations 20 and 21 are met without degrading system reliability if and when the proposed Project is operating at maximum capacity. The RUS is the lead agency, with Western cooperating for a separate environmental review of the Big Bend to Witten line under NEPA and the Act. Potential effects of this transmission line are addressed in the *Effects of the Action* section in this BO. Other federal actions associated with the proposed Project may require separate section 7 consultation with the USFWS.

Bakken Marketlink Project (Montana)

Keystone Marketlink, LLC, a wholly owned subsidiary of TransCanada Pipelines Limited, is proposing to construct and operate the Bakken Marketlink Project. The project would include construction of facilities to provide crude oil transportation service from near Baker, Montana, to Cushing, Oklahoma. Keystone Marketlink, LLC obtained commitments for transport of approximately 65,000 barrels per day (bpd) of crude oil through the Bakken Marketlink Project. The Bakken Marketlink Project could deliver up to 100,000 bpd to Cushing, Oklahoma depending on ultimate shipper commitments.

The Bakken Marketlink facilities in Montana would consist of piping, booster pumps, meter manifolds, and two 250,000-barrel tanks that would be used to accumulate crude from connecting third-party pipelines and terminals, as well as a 100,000-barrel tank that would be used for operational purposes. Tanks at Baker will be external floating roof tanks. The facilities in

Montana would also include a proposed NPS 16 pipeline that would be approximately 5 miles in length, originating south of pump station 14 at a third party tank farm in Fallon County, and extending to the two accumulation tanks adjacent to the proposed pump station 14. TransCanada Pipelines Limited Bakken held introductory meetings with State and local permitting agencies in 2011, and also held a meeting for potentially affected landowners along the route. Adjustments in the alignment are possible as a result of civil surveys, further landowner discussions, and permitting.

Bakken Marketlink would deliver crude oil into Cushing, Oklahoma, a key pipeline transportation and crude oil storage hub with over 50 million barrels of storage capacity. Crude oil delivered by the Bakken Marketlink Project would be received into storage tanks at Cushing and would either be pumped to the Gulf Coast Project pipeline or to other pipelines and tank farms near Cushing. The Cushing area is a major crude oil marketing, refining, and pipeline hub that provides shippers with many delivery options and market access. The proposed in service date for the Bakken Marketlink Project is projected to be the first or second quarter of 2015. Potential effects of Bakken Market Link project are described in general in the BA and the EIS, and are addressed in the *Effects of the Action* section in this document.

American Burying Beetle

Species Description

The ABB is the largest silphid (carrion beetle) in North America, reaching 1 to 1.8 inches in length (Wilson 1971, Anderson 1982, Backlund and Marrone 1997). The ABB is black with orange-red markings. The hardened elytra (wing coverings) are smooth, shiny black, and each elytron has two scallop-shaped orange-red markings. The pronotum (hard back plate on the front portion of the thorax of insects) over the mid-section between the head and wings, is circular in shape with flattened margins and a raised central portion. The most diagnostic feature of the ABB is the large orange-red marking on the raised portion of the pronotum, a feature shared with no other members of the genus in North America (USFWS 1991). The ABB also has orange-red frons (the upper, anterior part of the head), and a single orange-red marking on the clypeus, which is the lower face located just above the mandibles. Antennae are large, with notable orange club-shaped tips.

Gender can be determined from markings on the clypeus; males have a large, rectangular, red marking and females have a smaller, triangular, red marking. The age of the adults is determined by intensity of appearance. The markings of teneral ABBs (young beetles emerging during late summer) are brighter and appear more uniform in color while the exoskeleton is softer and in general more translucent. The pronotum of a mature, early summer adult tends to be darker than the markings on its elytra, with the former appearing dark orange to red and the latter appearing orange. The senescent (mature, post-breeding) ABB has pale elytral markings and are more scarred. They often have pieces missing from the margin of the pronotum or elytra, have cracks in the exoskeleton, and/or are missing appendages such as tarsi, legs, or antennae (USFWS 2008a).

Life History

The life history of the ABB is similar to that of other burying beetles (Kozol et al. 1988; Pukowski 1933; Scott and Traniello 1987; Wilson and Fudge 1984). A nocturnal species, the ABB is active

in the summer months and bury themselves in the soil during the winter. The young tenerals emerge in late summer, over-winter as adults, and comprise the breeding population the following summer (Kozol 1990b). Both adults and larvae are dependent on carrion for food and reproduction.

Winter Inactive Period: When the nighttime ambient air temperature is consistently below 60°F (15.5°C), ABBs bury into the soil and become inactive (USFWS 1991). In Nebraska, this typically occurs between early September to early June (W.W. Hoback, pers. comm.) and these dates are likely similar in South Dakota. However, the length of the inactive period can fluctuate depending on temperature. Recent studies indicate that ABBs bury to depths ranging from 0 to approximately 20 centimeters in Arkansas (Schnell et al. 2007) and at least 18 centimeters deep depending on the depth of frost in Nebraska and probably South Dakota.

During the winter months in the northern portion of ABB's range (i.e., South Dakota and Nebraska), soil commonly freezes to several feet below the surface. In the Nebraska Sandhills, for example, extreme penetration of frost was estimated between four feet and five feet (Floyd 1978), and water pipes to cattle tanks are still typically buried five feet to avoid freezing (K. Graham, pers. comm.). Since these depths exceed ABB burial depths, the species likely uses a survival strategy in Nebraska and South Dakota that permits the lowering of body temperature to freezing or near-freezing during the coldest portions of the winter (W.W. Hoback, pers. comm.). The lowering of body temperature slows metabolism and helps ensure fat reserves are sufficient to last until emergence in late May or early June (W.W. Hoback, pers. comm.). Additionally, recent research appears to show that ABB will burrow to below the frost line to avoid freezing as well (W.W. Hoback, pers. comm.).

Preliminary data suggest that over-wintering results in significant mortality (Bedick et al. 1999). Winter mortality may range from 25 to 70 percent depending on year, location, and availability of carrion in the fall (Schnell et al 2007; Raithel 1996-2002, unpubl. data, as cited in USFWS 2008b). Over-wintering ABBs with access to a whole vertebrate carcass in the fall had a survival rate of 77 percent versus a 45 percent survival rate for those ABBs not provisioned with a carcasses (Schnell et al. 2007).

Summer Active Period: The ABB emerges from its winter inactive period in mid to late May when ambient nocturnal air temperatures consistently exceed 60° F. In Nebraska, Bedick et al. (1999) found that ABB activity was highest when nighttime temperatures were between 59° F (15° C) and 68° F (20° C). They are most active from two to four hours after sunset, with no captures recorded immediately after dawn (Walker and Hoback 2007, Bedick et al. 1999). Weather, such as rain and strong winds can result in reduced ABB activity (Bedick et al. 1999). During the daytime, ABBs are believed to bury under the vegetation litter to avoid desiccation and predators. The ABB begin rearing broods soon after emergence in late May to early June. During late May and early June ABBs secure a mate and carcass for reproduction purposes. The reproductive process takes approximately 48-69 days. Capture rates for ABBs are highest from mid-June to early-July and again in mid-August (Kozol et al. 1988, Bedick et al. 2004, USFWS 1991) with a decrease in pitfall captures in late July (Kozol et al. 1988) because the species has gone underground tending its brood.

Feeding: Carrion selection by adult ABBs *for food* can include an array of available carrion

species and size (Trumbo 1992). However, carrion must be within a specific weight range for it to be used by ABB *for reproductive purposes*. Kozol et al. (1988) found no significant difference in the ABB's preference for avian verses mammalian carcasses. Burying beetles are capable of finding a carcass between one and 48 hours after death at a distance of up to 2 miles (3.22 km, Ratcliffe 1996). Success in finding carrion depends upon many factors including availability of optimal habitats for small vertebrates (Lomolino and Creighton 1996), density of competing invertebrate and vertebrate scavengers, individual searching ability, reproductive condition, temperature (Ratcliffe 1996) and other abiotic factors such as wind speed and humidity.

Reproduction: Upon emergence from their winter hibernation in early June, ABBs begin searching for a proper-sized carcass for reproduction in Nebraska and South Dakota. The species is able to locate carcasses using chemoreceptors on their antennae. Once a carcass has been found, inter-specific as well as intra-specific competition occurs until usually only a single dominant male and female burying beetle remain (Scott and Traniello 1989). Kozol (1991) reported that the ABB typically out-competes other burying beetles as a result of its larger size. Male and female ABBs cooperatively bury a carcass, but individuals of either sex are capable of burying a carcass alone (Kozol et al. 1988). Once underground, both parents shave off the fur or feathers, roll the carcass into a ball, and treat it with anal and oral secretions that retard the growth of mold and bacteria. The female ABB lays eggs in the soil near the carcass. Parental care in this genus is elaborate and unique because both parents participate in the rearing of young (Bartlett 1987, Fetherston et al. 1990, Scott 1990, and Trumbo 1990), with care by at least one parent, usually the female, being critical for larval survival (Ratcliffe 1996).

Brood sizes of ABBs can sometimes exceed 35 larvae, but 12-18 is more typical (Kozol 1990a). Altricial (helpless at birth), lightly hardened larvae hatch in about 12-14 days. The parents move these first instar larvae to the carcass. The developing larvae solicit feeding by stroking the mandibles of the parents. Both male and female parents regurgitate meat to the larvae. The larvae are soon capable of feeding directly from the carcass. In about 10-14 days large, third instar larvae burrow a short distance from the now-diminished carcass and form pupation cells. One or both of the parents may remain with the pupae for several days and at least one parent, usually the female, may remain with the pupae until they pupate (Kozol 1991). So, for approximately 22-28 days, adult ABBs are present with their brood. New adults emerge in about 26-51 days. The reproductive process from carcass burial to eclosure (i.e., emergence of the adult from pupae) is about 48 to 79 days (Ratcliffe 1996, Kozol 1991, Bedick et al. 1999). Females are reproductively capable immediately upon eclosure. The young beetles emerge in late summer and over-winter as adults; they comprise the breeding population the following summer (Kozol 1990b). In Nebraska, Bedick et al (1999) found that ABBs reproduce only once per year.

Movement: American burying beetles are mobile because they must be able to move to find carrion resources for feeding and reproductive purposes. The species has been reported moving distances ranging from 0.10 to 2.6 miles per day in various parts of their range. Creighton and Schnell (1998) conducted a study on movement patterns of ABBs at Camp Gruber and Fort Chaffee in 1992 and 1993. They recaptured 68 ABBs over a 12 night period; of those 68, 23 (29.5 percent) were recaptured at a site different than the original site of capture. The mean distance moved of the 23 recaptured ABBs over the 12 night sampling period was 1.21 miles for each ABB (0.10 miles per night per ABB). The minimum and maximum distance moved by an individual recaptured ABB was 0.16 mile in one night and 4.3 miles in five nights, respectively. Six ABBs

were recaptured two or three times. The mean movement for these six ABBs was 6.2 miles over six nights, 1.03 miles per night over the entire sampling period. The maximum distance moved by one of these six was 0.76 miles in one night (USFWS 2008b).

Bedick et al. (2004) reported average nightly movements of 0.62 mile, with 85 percent of recaptures moving distances of 0.31 miles per night. Schnell et al. (1997-2003) annually determined the average nightly movements of the ABB to be 0.62 miles, using marked individuals over a nine-year period at Camp Gruber. The smallest average nightly movement for any given active season over that same period was 0.52 miles. Schnell et al. (1997-2006) reported a one day movement of 2.6 miles; previously the greatest distance moved was 1.78 miles (Creighton and Schnell 1998).

Habitat: ABBs are considered habitat generalists and have been successfully live-trapped in several vegetation types including native grasslands, grazed pasture, riparian zones, coniferous forests, mature forest, and oak-hickory forest, as well as on a variety of various soil types (Creighton et al. 1993; Lomolino and Creighton 1996; Lomolino et al. 1995; USFWS 1991). Ecosystems supporting ABB populations are diverse and include primary forest, scrub forest, forest edge, grassland prairie, riparian areas, mountain slopes, and maritime scrub communities (Ratcliffe 1996; USFWS 1991). The ABB readily moves between different habitats (Creighton and Schnell 1998, Lomolino et al. 1995) (USFWS 2008b). Although thought to be a habitat generalist, it is likely that the ABB is more substrate (soil) specific in its selection of carrion burial sites. Soil conditions for suitable ABB habitat must be conducive to excavation by ABBs (Anderson 1982; Lomolino and Creighton 1996). Soils in the vicinity of captures are all well drained and include sandy loam and silt loam, with a clay component noted at most sites. Level topography and a well formed detritus layer at the ground surface are common (USFWS 1991). Certain soil types such as very xeric (dry), saturated, or loose, sandy soils are considered unsuitable for carcass burial and thus are unlikely habitats.

Habitat in South Dakota and Nebraska has often been categorized based on moisture, land use, and the presence of ABB from previous studies in Nebraska. For the Nebraska Sandhills population, this ranking system appears to generally describe areas of potential ABB occurrence. The following habitat descriptions for prime and good habitat are consistent with the Backlund et al. (2008) description of the best habitat for ABB in South Dakota, which they described as sandy grasslands with scattered stands of trees dominated by cottonwood, and commonly including sub-irrigated meadows and groundwater streams. As in Nebraska, the dominant land cover in the South Dakota ABB habitat is native grassland, and is primarily used for range and hay land. Low meadows are dominated by grasses and forbs typical of tallgrass prairie while the uplands consist mostly of mixed grass prairie flora.

Status and Distribution

The ABB was designated as a federally endangered species on July 13, 1989 (54 Fed. Reg. 29,652). At that time, only two, disjunct, natural populations occurred at the extremities of the species' historic range of 35 states; one population was known from four counties in Oklahoma and another population was located on a small island off the coast of Rhode Island (USFWS 2008a). Critical habitat was not designated for the ABB.

Distribution: Historically, the geographic range of the ABB included over 150 counties in 35 states, covering most of temperate eastern North America and the southern borders of three eastern Canadian provinces (USFWS 1991; Peck and Kaulbars 1987) (Figure 1). Documentation of records is not uniform throughout this broad historical range. More records exist from the Midwest into Canada and in the northeastern United States than from the southern Atlantic and Gulf of Mexico region (USFWS 1991). However, during the 20th century, the ABB disappeared from over 90 percent of its historical range (Ratcliffe 1995). The last ABB specimens along the mainland of the Atlantic seaboard, from New England to Florida, were collected in the 1940s (USFWS 1991). At the time of listing, known populations were limited to one on Block Island, Rhode Island; and one in Latimer County, Oklahoma. After the species was listed in 1989, survey efforts increased and the ABB was discovered in more locations, particularly in South Dakota, Nebraska, and Oklahoma (Figure 1).

Currently, the ABB is known to occur in eight states thanks to extensive survey efforts for the species (Figure 1). These include Block Island off the coast of Rhode Island, Nantucket Island off the coast of Massachusetts, eastern Oklahoma, western Arkansas (Carlton and Rothwein 1998), Loess Hills in south-central Nebraska and Sandhills in north-central Nebraska (Ratcliffe 1996, Bedick et al. 1999) (Figure 2), Chautauqua Hills region of southeastern Kansas (Sikes and Raithel 2002), south-central South Dakota (Backlund and Marrone 1995, 1997; Ratcliffe 1996) in Todd Tripp, Gregory, and Bennett counties, and northeast Texas (Godwin 2003). There is some concern that the population in Texas has been extirpated due to competition with fire ants (R. Harms, pers. comm.). Most populations are located on private land.

Population Estimate: Although ABB are relatively easy to capture, obtaining precise estimates of absolute or even relative densities of ABB populations remains a challenge (USFWS 2008a). The standard mark and re-capture technique used to estimate population size assumes that marked and unmarked individuals are equally likely to be captured, and that a substantial number of the animals would be recaptured from one trapping period to the next. However, due to ability of the ABBs to range widely and their reproductive strategy that includes retreating underground for several weeks, these assumptions may not apply. Because the ABB has a one-year life cycle, each year's population levels are largely dependent on the reproductive success of the previous year. Therefore, populations are likely cyclic, with high numbers and abundance in one year, followed by a decline in numbers the succeeding year. This may indicate a relatively rapid turnover rate in the trappable ABB population due to factors such as natural mortality, dispersal, and burrowing underground and attending carrion/broods (Creighton and Schnell 1998).

Reasons for decline:

There is little doubt that habitat loss and alteration affect this species at local or even regional levels, and could account for the extirpation of populations once they become isolated from others (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999). The prevailing theory regarding the ABBs' decline is habitat fragmentation (USFWS 1991) which: (1) reduces the carrion prey base of the appropriate size for ABB reproduction and (2) increases the vertebrate scavenger competition for this prey (Kozol 1995, Ratcliffe 1996, Amaral et al. 1997, Bedick et al. 1999) due to its relatively large size and specialized breeding behavior (Creighton et al. 2007). The ABB Recovery Plan (USFWS 1991) and the 5-yr status review of the species (2008a) also

identify the following as potential threats to the ABB: disease/pathogens, DDT, loss of genetic diversity in isolated populations, agricultural and grazing practices, and invasive species.

Habitat Loss and Fragmentation: During the westward expansion of settlement in North America, the removal of top-level carnivores such as the grey wolf (*Canis lupis)* and eastern cougar (*Puma concolor)* occurred simultaneously with land use changes that fragmented native forest and grasslands and created more edge habitats (such as the edge between forest and grassland, or grassland and cropland). These two processes resulted in mid-sized carnivores and scavengers becoming more abundant than they were in presettlement times. Mid-sized carnivores prey on small mammals and birds and scavengers directly compete with carrion beetles for carrion. Mid-sized carnivores and scavenger species include American crow (*Corvus brachyrhynchos)*, raccoon (*Procyon lotor)*, red fox (*Vulpus vulpes)*, opossum (*Didelphis virginiana)*, striped skunk (*Mephitis mephitis)*, rats (*Neotoma* spp.) and Hispid cotton rats (*Sigmodon hispidus*), coyotes (*Canis latrans),* feral cats, and other opportunistic predators (Wilcove et al. 1986) and scavengers.

A number of these species, especially the raccoon and striped skunk, have undergone dramatic population increases over the last century (Garrott et al. 1993), and the coyote and opossum have expanded their ranges. These scavengers may extend hundreds of feet from edges into forest in eastern North America. Matthews (1995) experimentally placed 64 carcasses in various habitats in Oklahoma where ABBs and the roundneck sexton beetle (*N. orbicollis)*, another type of burying beetle and a species thought to have similar life history characteristics as that of the ABB) had been previously documented, then tracked the organisms that scavenged them. Of the carcasses, 83 percent were claimed by ants, flies, and vertebrate scavengers; about 11 percent were claimed by the roundneck sexton beetle, and only one was claimed by ABBs.

Projects that cause ABB habitat fragmentation are common. Since 2011, large tracts of native grassland have been converted to row crops in Nebraska and South Dakota due to elevated grain prices. This conversion has resulted in the loss and fragmentation of a considerable amount of habitat for the ABB. Conversion is considered a permanent loss of habitat.

Carrion requirements: Unavailability of the appropriate sized carrion for reproduction likely also caused the decline of the ABB. Data available for the ABB on Block Island, Rhode Island supports the contention that the primary mechanism for the species' rangewide declines lies in its dependence on carrion of a larger size class relative to that used by all other North American burying beetles, and that the optimum-sized carrion resource base has been reduced throughout the species' range (USFWS 1991).

American burying beetles require carcasses of 3.5 to 7.0 ounces (99.22 to 198.45 g, Kozol et al. 1988) to maximize its fecundity, whereas all other burying beetles can breed abundantly on much smaller carcasses, with the smaller species using carcasses of 0.11 to 0.18 ounces (3.12 to 5.10 g, Trumbo 1992). Since the middle of the 19th century, certain animal species in the favored weight range for ABB reproductive use have either been eliminated from North America or significantly reduced over their historic range (USFWS 1991), including the passenger pigeon (*Ectopistes migratorius),* greater prairie chicken (*Tympanchus cupido)* and wild turkey *(Meleagris gallopavo)*. The passenger pigeon was estimated at one time to have been the most common bird in the world, numbering 3 to 5 billion (Ellsworth and McComb 2003). There were once as many passenger pigeons within the approximate historic range of the ABB as there are numbers of birds of all

species overwintering in the United States today. Wild turkeys, for example, occurred throughout the range of the ABB, and until recently, were extirpated from much of their former range. Black-tailed prairie dogs (*Cynomys ludovicianus)* which occur in the northern portion of the ABB's range have drastically declined (Miller et al. 1990) and previously dense populations of these mammals may also have been important for reproduction by ABB (USFWS 2008a).

Illumination: Although somewhat anecdotal, it is likely that the gradual lighting of the nighttime sky due to development across the central and eastern United States has also hastened the decline of the ABB. Like all insects, the ABB is attracted to light sources. Attraction to artificial light sources increases the risk or predation, increases energy requirements, and reduces recruitment of the next generation.

Climate Change: A five year review was completed for the ABB which identified the potential effects of global climate change on the ABB habitat and disease (USFWS 2008a). The frequency of extreme weather events on ABB populations, however, has not been assessed. Nevertheless, some predictions, although anecdotal, can be made about how weather events may affect the species. Section 4.14 of the Draft SEIS includes analysis regarding potential climate impacts in the region of the proposed project (DOS 2013). It includes information taken from a report that downscaled four global climate models and averaged them for eight climate regions in the U.S., as well as a review of information from other similarly downscaled global models. A gradual drying trend is predicted in the summer months in South Dakota and Nebraska through 2050. The ABB is subject to desiccation and thus, a drying trend may result in the contraction of the species' range over the next 50 years (i.e., the life of the Project) (W.W. Hoback, pers. comm.). By 2040–2069, the national average annual temperature is predicted to increase above the baseline of 1980 to 2009 by between 2.8°F and 6.6°F, depending on the model and the emissions scenario evaluated (USGCRP 2009). Although difficult to predict, a rise in temperatures could have an effect on the ABB. An elevation in winter temperatures could result in the species not going completely dormant and using extra fat reserves potentially precluding the species from being able to overwinter. This could also result in a range contraction for the species (W.W. Hoback, pers. comm.). As stated above, however, the frequency of extreme weather is not reasonably certain at this point in time.

Analysis of the Species/Critical Habitat Likely to be Effected

The ABB is likely to be adversely affected by the construction, operation, and maintenance of the Keystone XL pipeline and its associated facilities. Various types of disturbance associated with typical construction activities can result in impacts to the ABB. As noted earlier, no critical habitat has been designated for the ABB; therefore, none would be affected by the Project.

Environmental Baseline

The environmental baseline is the past and present impacts of all Federal, State, or private actions and other human activities in an action area, the anticipated impacts of all proposed Federal projects in an action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions that are contemporaneous with the consultation in process (50 C.F.R. § 402.02). The environmental baseline is an analysis of the effects of past and ongoing human induced and natural factors, leading to the current status of the species, its habitat, and

ecosystem, within the action area (i.e., area affected by the project). The environmental baseline is a "snapshot" of the status of the ABB at the time this document was prepared.

In the United States, the ABB is known or likely to occur in the action area only in the states of South Dakota and Nebraska. Therefore, project impacts evaluated in this BO are limited to those in South Dakota and Nebraska. Other factors having little to do with construction and operation of the proposed Project, such as climate change may also affect the ABB in the future.

Status of the Species in the Action Area

The "action area" means all areas to be affected directly or indirectly by the Federal Action and not merely the immediate area involved in the action. For this consultation, the action area consists of not only areas directly impacted by the issuance of the Presidential Permit (the "Action"), but the area also indirectly effected by the proposed Keystone XL pipeline enabled by the permit. These include effects to all land disturbed by the footprint of the Project such as preconstruction, construction, operation, and reclamation activities. Lands affected include the pipeline construction ROW and land used by the above ground ancillary facilities (i.e., additional TWAs, pipe stockpile sites, rail sidings, contractor yards, construction camps, pump stations, delivery facilities and access roads). Also included as part of the action area are the effects of the interrelated and interdependent power lines that would be built by private power companies to supply electricity to 20 Project pump stations along the pipeline as well as the 230 kV transmission line in Tripp and Lyman counties in South Dakota. The facilities required by the Bakken Marketlink project are also considered interrelated and interdependent parts of the proposed Project.

American Burying Beetle

The following is a summary of the species in the proposed Project action area in South Dakota and Nebraska.

South Dakota: The proposed project passes through Tripp County in South Dakota, a county where ABB are known to be present. In 1995, Backlund and Marrone (1997) discovered the ABB in the large blocks of mesic grassland habitat located in the southern portion of Tripp County. The population has been monitored almost annually from 1995-2007, and appears to have remained stable in abundance and distribution (Backlund unpubl data, SDGFP Report) (Backlund and Marrone 2003). This population is likely part of the metapopulation that occurs in the Nebraska Sandhills (W.W. Hoback pers. comm.). Surveys in 2005 showed that ABBs in South Dakota are concentrated in southern Tripp County where the population is conservatively estimated to be approximately 1,000 individual ABBs in an area of approximately 220 square kilometers (54,363 acres) (Backlund et al. 2008). However, the actual number or percentage of ABB in the vicinity of the proposed Keystone XL pipeline in South Dakota cannot be determined because there have not been any surveys done at the proposed Project location.

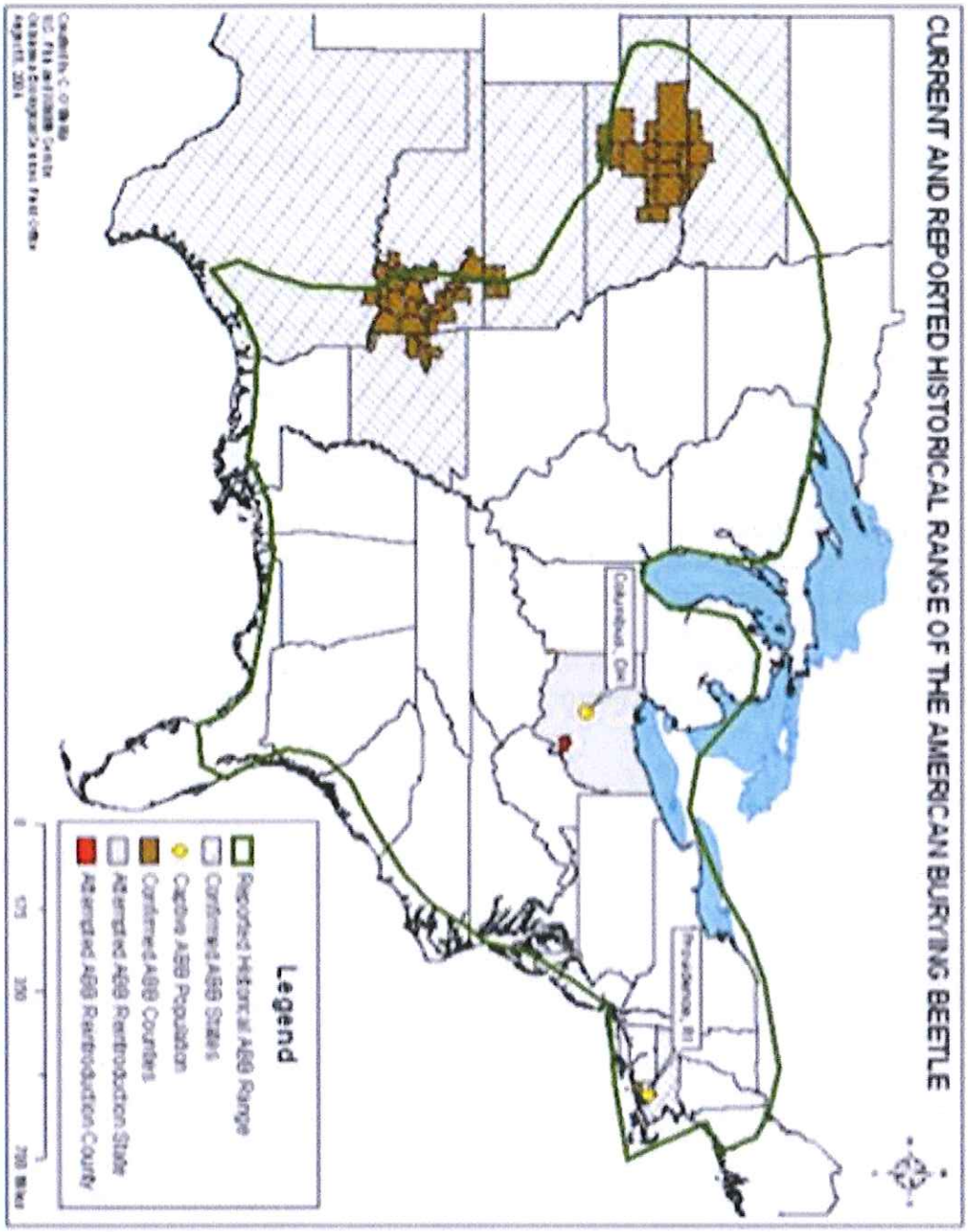

Figure 1. Historic and Current Range of the ABB.

Nebraska: The proposed project passes through three counties in Nebraska with known ABB presence (Keya Paha, Boyd, and Holt counties) and one county with historic ABB occurrence (Antelope County) (Hoback 2012). The proposed pipeline route then passes through a number of central and southern Nebraska counties where the ABB has not been found historically or in the last 10 years based on surveys done for the species.

During the summer of 2012, ABB 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 5 trap nights following standard trapping methods (NGPC and USFWS 2008) (Appendix B). Traps were set on road shoulders of state and county highways within suitable habitat. Ninety-five ABBs were captured at 28 sampling locations in Keya Paha and Holt counties. Capture rates ranged from 0.2 ABB per trap nights to 3.0 ABB per trap night. No ABB were caught in Boyd or Antelope counties. Captures of ABB occurred in northwestern Holt County, but not east of Highway 183. Control traps were run during sampling at sites in Holt County in accordance with protocol (see Appendix B), where ABB are known to be numerous. These traps produced between 0.7 and 7.0 ABB per trap night (Hoback 2012).

The control trap success suggests that populations of ABB to the east of the Sandhills region are not as dense as those in the Sandhills. Very little habitat to support ABB is present east of Highway 183 in Holt County or in Antelope County. The species is also susceptible to desiccation and thus, the drought conditions likely affected trapping success; the 2012 abundance of ABB may have been higher under normal conditions. Drought conditions causing low soil moisture may have affected the number of ABBs caught in 2012 surveys, but control traps did not support that conclusion. Habitat appears to be a more important indicator of abundance compared to soil moisture. Overall, few ABB were captured in 2012 compared to control sites at the same time (Hoback 2012).

Habitat Availability in the Action Area

The proposed Project would result in construction of approximately 500 miles of pipeline through South Dakota and Nebraska. Surveys of habitat suitability for ABBs along the pipeline route in South Dakota and Nebraska were conducted in 2008 to 2012 (DOS 2012). Habitat for the ABB that was crossed by the ROW and other Project facilities was classified using a rating system developed from previous studies in Nebraska. The rating system is based on soil moisture, land use, and the presence of ABB. The ABB uses similar habitat in southern South Dakota and northern Nebraska and thus, the rating system was applicable for use along the pipeline segment located in both states.

The following five habitat rating criteria were used to describe ABB habitat quality in the pipeline ROW in South Dakota and Nebraska:

Prime (5): Undeveloped wet meadows dotted with trees (especially cottonwoods [*Populus deltoids*]) or forest areas visible. Water sources are available including the presence of a river, stream, or sub-irrigated soils. Cropland is not visible within the mile segment evaluated or is at a distance greater than 2 miles.

Good (4): Native grasslands (tall or mixed grass prairie) with forbs. Low wetland meadows that are grazed by cattle or used for haying. Trees (usually cottonwoods) are present. Sources of

water are within a mile, but the area has either some cropland or light pollution such as yard lights or houses within a mile.

Fair (3): 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 one mile.

Marginal (2): Potential habitat restricted to one side of the pipeline ROW, with row crop agriculture on one side or dry, sandy, upland areas with exposed soil or scattered dry-adapted plant such as yucca (*Yucca* spp.).

Poor (1): Both sides of the pipeline ROW with row crop agriculture or habitat with the potential for large amounts of light pollution and disturbance associated with town or city edge.

The habitat rating considers soil characteristics and land use data (Hoback 2011a). Row crop agriculture does not support ABB populations, while grazed areas and hay meadows potentially do. Loose soils provide the best habitat for reproduction while tight clays or other tight soil types do not (A. Smith, Smith Environmental and Research Consulting House, pers. comm.). Human disturbance beyond agriculture are also considered because suitable habitat near cities is affected by light pollution, increased scavenger presence, and a different potential prey base. Dry areas are rated as less suitable because burying beetles suffer high rates of mortality due to water loss (Bedick et al. 2004). ABBs seek moist conditions during periods of inactivity under experimental conditions (Hoback 2008).

In Nebraska, after habitat is rated and mapped with windshield surveys, areas ranked 4 (good habitat) or 5 (prime habitat) are surveyed using baited pitfall traps (Hoback 2011a). Excellent habitat does not always support ABB. The species has not been captured in traps placed in habitats rated 1 (poor) or 2 (marginal) and only very rarely have they been captured in habitats rated 3 (fair). In Nebraska, areas that are rated as 3 or less are considered unsuitable to sustain ABB. Habitats rated 3 have caught ABB in traps in less than 1% of samples (3 ABB in 400 trap nights). Because of ABB dispersal abilities with typical flights of more than one mile per night (and up to seven miles), capture rates in marginal habitats are potentially the result of attraction of beetles to unsuitable habitats.

The above habitat descriptions for prime and good habitat are consistent with Backlund et al. (2008) description of the best habitat for ABB in South Dakota, which they described as sandy grasslands with scattered stands of trees dominated by cottonwood, and commonly including sub-irrigated meadows and groundwater streams. As in Nebraska, the dominant land cover in the South Dakota ABB habitat is native grassland, and is primarily used for range and hay land. Low meadows are dominated by grasses and forbs typical of tallgrass prairie while the uplands consist mostly of mixed grass prairie flora.

South Dakota: In South Dakota, ABBs occur south of State Highway 18 (C. Bessken, pers. comm.) in the southern half of Tripp County (Backlund et al. 2008). The Project ROW passes through about 35 miles of habitat where ABBs may occur (25 miles of prime habitat, 8 miles of good habitat, and 2 miles of fair habitat (Figure 2). Remaining habitat north of Highway 18 at about mile post (MP) 563 is fair to marginal and is outside the known range of ABBs (Figure 2). Habitat ratings from mile post (MP) 566 to MP 600 are shown in Table 7 (DOS 2012).

Nebraska: In Nebraska, the Project passes through 47 miles of habitat where ABBs may occur (23 miles of prime habitat, 16 miles of good habitat, and 8 miles of fair habitat) (Figure 2). Suitability ratings for ABB habitat crossed by the proposed Project in Nebraska are provided in Figure 2 and Table 8. Habitat ratings from mile post (MP) 601 to MP 659 are shown in Table 8 (DOS 2012).

Factors Affecting the Species within the Action Area

Adequately evaluating the effects of this proposed project on the ABB requires that the USFWS consider not only the impacts from the proposed Project, but the context in which they would likely occur. This context includes ongoing effects to ABB from current activities as well as anticipated effects from projects likely to occur in the foreseeable future.

In the northern part of their range, the primary causes of decline of the ABB are thought to be (1) pesticide use; and (2) habitat loss, degradation, and fragmentation, which correspond to a decrease in availability of suitable carrion and removal of previously suitable ABB habitat. Developed land and land that has been converted for agricultural, grazing, and other uses, often favor scavenging mammal and bird species that compete with carrion beetles for carcasses. Additionally, developing and converting land has led to declines in ground nesting birds, which probably historically provided a large portion of the carrion available to ABB. Fire suppression in prairie habitats allows the encroachment of woody plant species, particularly the eastern red cedar, which is thought to degrade habitat for burying beetles by limiting their ability to forage for carrion. In South Dakota and Nebraska, we do not have information specific to the proposed Project action area regarding the impacts of ongoing human and natural factors and how those factors may affect the use of the Keystone XL Project sites by ABB. However, it is reasonable to assume that continuing development activities such as conversion of native prairies to row crops, increased human developments or disturbances, increased lighting, and placement of man-made structures such as homes, power lines, and roads on the landscape would affect the ABB and its habitat on proposed Project lands in the same manner as elsewhere.

Shifts in land use are affecting ABB habitat within the species range. South Dakota and Nebraska are losing native prairie rangeland through conversion to cropland at an escalating rate because the accelerating use of ethanol in gasoline has increased demand for corn and consequently raised the price of the grain (GAO 2007). About a third of the average increase in harvested cultivated crop acreage on corn and soybean farms in the United States, results from the average conversion of hay, USDA Conservation Reserve Program grassland or grassland pasture (Pore, Robert. August 28, 2011).

Effects of the Action

The effects of the action are the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. These effects are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species for purposes of preparing a BO on the proposed action (50 CFR § 402.02). This BO does not examine any effects that the Proposed Project may contribute to climate change, consistent with the May 14, 2008, memorandum from Director Dale Hall: Expectations for Consultations on Actions that would emit Greenhouse Gases and the October 3, 2008, memorandum from the Solicitor of the Department of the

Interior: Guidance on the Applicability of the Endangered Species Act's Consultation Requirements to Proposed Actions Involving the Emission of Greenhouse Gases.

The "action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 C.F.R. § 402.02). Direct and indirect effects of the Action are part of the action area and include all land disturbed by the footprint of the proposed pipeline Project pre-construction, construction, operation, and reclamation activities. This includes construction of the pipeline ROW and land affected by the above ground ancillary facilities (i.e., additional temporary work space areas, pipe stockpile sites, rail sidings, contractor yards, construction camps, pump stations, delivery facilities, and access roads). Effects to be considered also include the effects of the interrelated and interdependent power lines that would be built by private power companies to supply electricity to Project pump stations along the pipeline, as well as the 230 kV transmission line in Tripp and Lyman counties in South Dakota, and the interrelated and interdependent facility required by the Bakken Marketlink project. The action area extends generally from the border of the United States with Canada to Steele City, Nebraska, and includes pumping stations 27 and 29 in Kansas and their associated power lines.

The proposed Project requires multiple activities at different stages of construction and operation. Each of these may result in different effects to ABB depending on when during the life cycle of the ABB the activities occur. These activities include preconstruction survey and staking of all proposed Project areas. Within the ROW, construction activities would include vegetation clearing; top soil removal and grading; trench excavation, pipe fitting, lowering, welding, inspection, hydrostatic testing, and backfilling and clean up; reclamation activities, such as re-contouring where necessary, soil decompaction and seeding. Post-construction reclamation of all temporary ancillary sites would also involve decompaction of soil where necessary and re-seeding. Borrow material would be used to back fill the pipe trench; for road construction or upgrading and road crossings, and preparation of ancillary sites, as necessary. The operation of the proposed Project would cause increases in temperature around the pipeline as the heat generated by the flowing oil dissipates from the pipe through surrounding soil. Conservation measures have been incorporated into the project to avoid and minimize adverse impacts to federally listed species including the black-footed ferret, whooping crane, pallid sturgeon, least tern, piping plover, ABB, and western prairie fringed orchid to provide for their conservation.

Pre-construction Activities

The pipeline ROW and ancillary sites would be surveyed and staked prior to construction. To the extent that surveying and staking would take place during the summer periods when ABB are above ground, there is a potential of injury to or mortality of ABB from collision or crushing by truck or other vehicles used in ABB habitat in South Dakota and Nebraska. Hoback et al. (2012) found that 99 percent of a closely related species *(N. marginatus)* survived when a pickup was driven and a turn was made over soil containing those individuals; in contrast, 77.2 percent of the beetles survived when a pickup was parked over the soil containing individuals. When working in suitable ABB habitat in Tripp, Keya Paha, and Holt counties, all parking and staging areas will be pre-located within the approved construction footprint. Vehicle traffic used in support of preconstruction activities will be confined to approved access roads when accessing the construction site.

Figure 2: ABB Habitat Ratings along Pipeline Route in South Dakota and Nebraska.

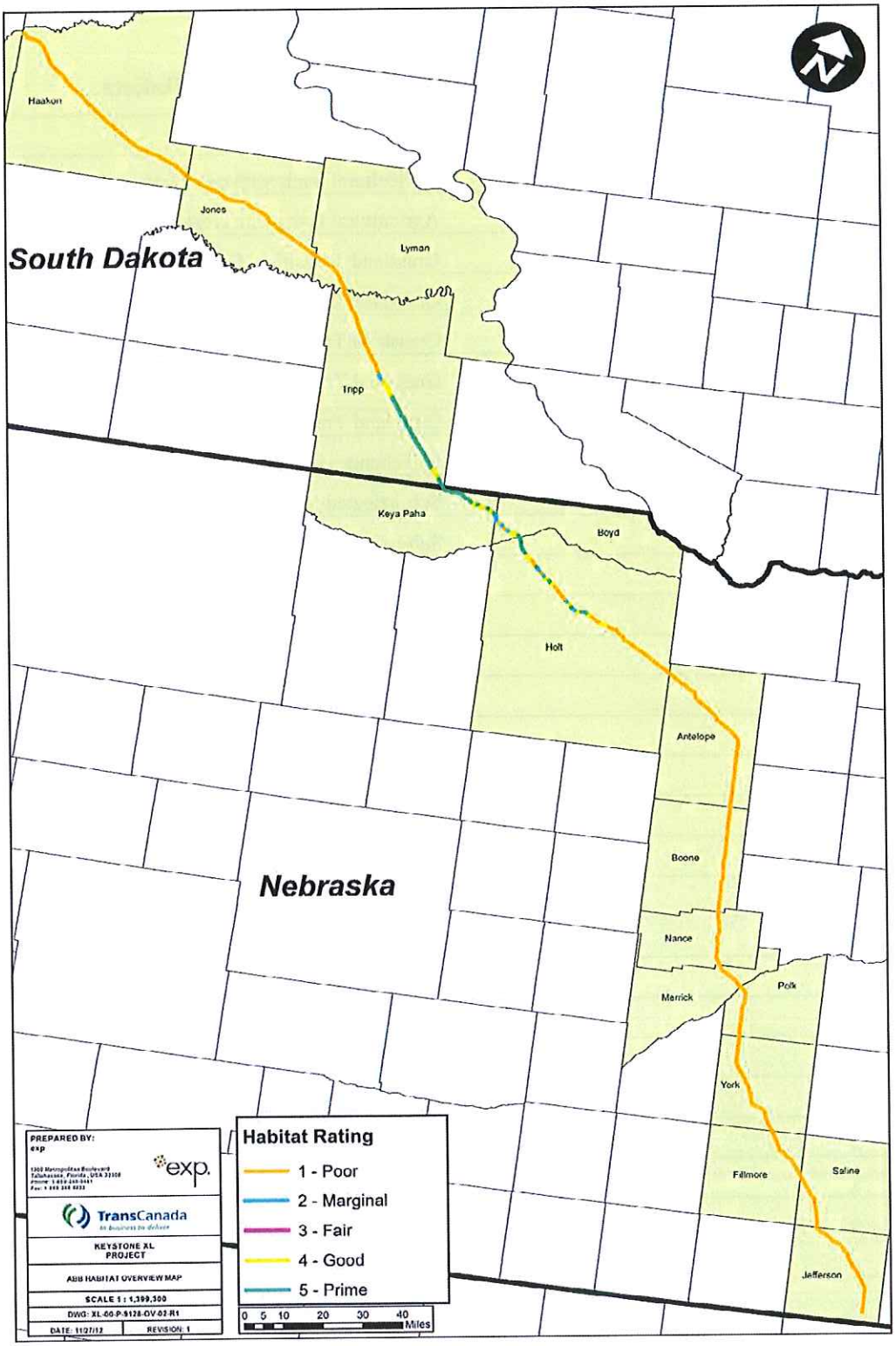

Table 7. Suitability Ratings of ABB habitat for the pipeline route in South Dakota.

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Tripp	566				x		Agricultural lands with creek bottoms
Tripp	567				x		Agricultural lands with creek bottoms
Tripp	568		x				Grassland Transition Zone
Tripp	569		x				Grassland Transition Zone
Tripp	570		x				Grassland Transition Zone
Tripp	571		x				Grassland Transition Zone
Tripp	572		x				Grassland Transition Zone
Tripp	573	x					Soil changes to sandy loam, drier
Tripp	574	x					Sub-irrigated Meadows
Tripp	575	x					Sub-irrigated Meadows
Tripp	576	x					Sub-irrigated Meadows
Tripp	577	x					Sub-irrigated Meadows
Tripp	578	x					Wet meadows
Tripp	579	x					Sub-irrigated Meadows
Tripp	580	x					Sub-irrigated Meadows
Tripp	581	x					Sub-irrigated Meadows
Tripp	582	x					Sub-irrigated Meadows
Tripp	583	x					Sub-irrigated Meadows
Tripp	584	x					Sub-irrigated Meadows
Tripp	585	x					Sub-irrigated Meadows
Tripp	586	x					Sub-irrigated Meadows
Tripp	587	x					Includes pump yard 20 site 1
Tripp	588	x					Sub-irrigated Meadows
Tripp	589	x					Sub-irrigated Meadows
Tripp	590	x					Sub-irrigated Meadows
Tripp	591	x					Sub-irrigated Meadows
Tripp	592	x					Sub-irrigated Meadows
Tripp	593	x					Sub-irrigated Meadows
Tripp	594	x					Sub-irrigated Meadows
Tripp	595		x				Upland, sandier, drier, hayed
Tripp	596		x				Upland, sandier, drier

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Tripp	597		x				Upland, sandier, drier
Tripp	598	x					Includes area for pump station-21 and access road
Tripp	599	x					Sub-irrigated Meadows
Tripp	600	x					NE border
Total Miles		**25**	**8**	**0**	**2**	**0**	

Table 8. Suitability ratings of ABB habitat for the pipeline route in Nebraska.

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Keya Paya	601	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	602	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	603	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	604	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	605	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	606	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	607	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	608	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	609	x					Includes access road 304.
Keya Paya	610		x				At Wolf Creek. Includes access road 305. Disturbance around house
Keya Paya	611	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	612		x				Some terracing and agriculture.
Keya Paya	613		x				State Highway 12, upland.
Keya Paya	614	x					Open range.
Keya Paya	615		x				Modest agricultural disturbance.
Keya Paya	616	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Keya Paya	617				x		Includes access road 306, along row crop.
Boyd	618				x		Includes access roads 307 and 308
Boyd	619		x				Rangeland or hayfields with somewhat dry

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
							conditions or absence of cottonwoods.
Boyd	620				x		Row crop agriculture or alfalfa fields in the ROW.
Boyd	621					x	Center pivots.
Boyd	622				x		Row crop agriculture or alfalfa fields in the ROW.
Boyd	623		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Boyd	624		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Boyd	625	x					Niobrara River
Holt	626	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	627	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	628	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	629	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	630	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	631		x				Hayfield with alfalfa.
Holt	632		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	633					x	Center-pivot.
Holt	634					x	Center-pivot.
Holt	635	x					Includes access road 311.
Holt	636				x		Row crop agriculture or alfalfa fields in the ROW.
Holt	637					x	Row crop agriculture in all directions.
Holt	638				x		Row crop agriculture or alfalfa fields in the ROW.
Holt	639		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	640	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	641		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	642					x	Row crop agriculture in all directions.
Holt	643					x	Row crop agriculture in all directions.
Holt	644					x	Row crop agriculture in all directions.

County	MP	Prime	Good	Fair	Marginal	Poor	Notes
Holt	645					x	Row crop agriculture in all directions.
Holt	646					x	Row crop agriculture in all directions.
Holt	647				x		Row crop agriculture or alfalfa fields in the ROW.
Holt	648		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	649	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	650				x		Row crop agriculture or alfalfa fields in the ROW.
Holt	651		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	652	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	653	x					Wet meadow habitat used for grazing or haying. No agricultural disturbance nearby.
Holt	654		x				Pump station 22 is in marginal habitat because the range west is prime but a center-pivot is directly east.
Holt	655					x	Row crop agriculture in all directions.
Holt	656					x	Row crop agriculture in all directions.
Holt	657					x	Row crop agriculture in all directions.
Holt	658		x				Rangeland or hayfields with somewhat dry conditions or absence of cottonwoods.
Holt	659		x				Connects to 281 north of O'Neil/
Total Miles		**23**	**16**	**0**	**8**	**12**	

The capture relocation method, which is discussed later in the BO, will also be applied in Nebraska prior to Project construction. The ABB will be impacted though implementation of this avoidance and minimization measure as described below.

Construction Activities

Project activities would result in a variety of temporary and permanent effects to the ABB and its habitat. If construction occurs during periods when ABB are active, movement of vehicles, especially heavy equipment and other human activities in the ROW or on ancillary construction sites could cause mortality or injury of adult beetles and larvae through soil compaction. Project construction activities such as clearing and grubbing of trees and shrubs, vegetation removal, grading, removal and stockpiling of topsoil, trenching, pipe laying, soil backfilling and compaction, and final grading and reclamation activities would occur in the pipeline ROW. These ROW construction activities and construction of temporary access roads in grassland areas would result in temporary habitat loss, temporary habitat fragmentation, and/or alteration of suitable ABB

habitat. Habitat degradation from human activities, soil compaction, and vegetation disruption in pipe yards, construction camps and contractor yards would result in similar temporary loss and fragmentation of ABB habitat. The extent of such habitat loss would depend on the time necessary to successfully restore affected grassland habitats after project construction. These actions would likely cause direct injury or mortality of ABB adults, larvae, and eggs by crushing or exposure to desiccation during soil excavation.

Construction of above-ground pump stations (i.e., pump station numbers 21, 22) and construction of power lines to service these pump stations may cause the permanent loss of the ABB habitat. The proposed pump stations in ABB grassland habitat in South Dakota and Nebraska are located along or between roads that already affect ABB habitat to some extent and leave a small permanent footprint (5-15 acres), and Project facilities would not provide habitat to competing wildlife. No ABB habitat would be affected by construction of a power line to pump station 21 in South Dakota. However, there is somewhat degraded ABB habitat in the vicinity of pump station 22 in Nebraska. In recognition of the potential impact to the ABB, NPPD has agreed to schedule substation and line construction activities for the line segment serving pump station 22 for during the ABB dormant or inactive time in the winter when soil would be frozen to avoid soil compaction (September 15 to April 1).

Given the small size of the pump station footprints, lack of ABB habitat along the power line route in South Dakota and commitment made to avoid ABB along the power line route in Nebraska, the effect of that loss in terms of habitat fragmentation of large extensive grassland landscapes is likely not substantial.

Amount of ABB Habitat Affected

Permanent loss of ABB habitat shown in Tables 9 (South Dakota) and 10 (Nebraska) results from: a) habitat covered by the pipeline pump stations (i.e., pipeline pump stations being built on ABB habitat) and b) ABB habitat areas in South Dakota and Nebraska rendered permanently unsuitable habitat by heat dissipating from the operating pipeline. All other Project-related impacts to grasslands should be temporary as shown in Tables 9 (South Dakota) and 10 (Nebraska) and limited to the time necessary for successful post-construction habitat restoration. It is anticipated that the construction methods of replacing topsoil and re-establishing natural vegetation would cause restoration of natural soil hydrology within the construction ROW and avoidance of long-term impacts to ABB habitat.

South Dakota

In South Dakota, the Project ROW and ancillary sites during construction and operation would affect approximately 628.8 acres of land with reasonable potential for occurrence of the ABB (Table 9). Of this 628.8 acres south of Highway 18 in Tripp County, 401.8 acres (63.9 percent) are classified as prime ABB habitat, 117.1 acres (18.6 percent) are good ABB habitat, 80.0 acres (12.7 percent) are fair habitat, and 29.9 acres (4.7 percent) are considered marginal habitat. Within the affected area, 526.28 acres would be temporarily lost up to 4 years or longer, depending on rainfall and success of restoration efforts. Construction and operation of the Project would cause the permanent loss of more than 102.51 acres of ABB habitat in Tripp County due to pump stations and the 22-foot-wide strip centered on the pipeline and affected by heat dissipating through the soil (see Operation of the Project, Thermal Effects from Heat Dissipation).

Table 9. Estimated ABB habitat acreage impacts in South Dakota (DOS 2012).

Permanent Impact[a]	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW[b])	0.00	5.34	0.00	21.34	66.14
Pump Stations	0.00	0.00	0.00	0.00	8.42
Permanent Access Road Easement	0.00	0.00	0.00	0.00	1.27
Total Acres	**0.00**	**5.34**	**0.00**	**21.34**	**75.83**
Temporary Impact[c]					
Temporary Easement (CL ROW)	0.00	20.96	0.00	85.00	263.25
Additional Temporary Workspace (CL ROW)	0.00	3.37	0.00	10.80	30.91
Auxiliary Site	0.00	0.00	80.01	0.00	29.50
Temporary Access Road Easement	0.00	0.20	0.00	0.00	2.28
Total Acres	**0.00**	**24.53**	**80.01**	**95.80**	**325.94**

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline (see *Operation of the Project* subsection, below).
[b] CL ROW = centerline of the ROW.
[c] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.
Note: Miles are the same for both temporary and permanent impacts as both are calculated using the pipe centerline.

Nebraska

In Nebraska, the Project would affect approximately 1,138.8 acres confirmed to be currently occupied by the ABB. Of the 1,138.8 acres, 427 acres (37.5 percent) are classified as prime ABB habitat, 269 acres (23.6 percent) are classified as good ABB habitat, 13.44 acres (1.2 percent) are fair habitat, 159 acres (14 percent) are marginal habitat and 270.3 acres (23.7 percent) are considered poor ABB habitat (Table 10); ABBs would be least likely to occur in poor habitat. Within the range of the ABB, 966.53 acres of habitat would be temporarily lost, for approximately four years or longer, depending on rainfall and success of restoration efforts. Construction of the pump stations and operation of the pipeline (see Operation of the Project, Thermal Effects from Heat Dissipation) would cause the permanent loss of approximately 172.30 acres of ABB habitat.

Mortality Estimates

South Dakota: The ABB may occur over 35 miles of the proposed pipeline route in South Dakota. However, no recent ABB presence/absence surveys were conducted along the pipeline ROW or on other Project lands in South Dakota as they were in Nebraska. However, the mortality of adult ABB caused by construction of the pipeline can be estimated by combining the number of acres affected within the ABB range in southern Tripp County (from Table 9, earlier), with the number of ABB estimated to occur per acre [from the Backlund et al. (2008) population estimate for southern Tripp County], and then using a habitat quality modifier to adjust for the likelihood of higher numbers of ABB in better habitat.

For example: 1,000 ABB/54,363 acres (Backlund et al. 2008) = 0.01839 ABB estimated per acre.

Table 10. Estimated ABB habitat acreage impacts in Nebraska (DOS 2012).

Permanent Impact[a]	Poor	Marginal	Fair	Good	Prime
Permanent Easement (CL ROW[b])	32.00	21.33	0.00	42.46	61.47
Pump Stations	0.05	14.99	0.00	0.00	0.00
Permanent Access Road Easement	0.00	0.00	0.00	0.00	0.00
Total Acres	**32.05**	**36.32**	**0.00**	**42.46**	**61.47**
Temporary Impact[c]					
Temporary Easement (CL ROW)	128.00	83.66	0.00	169.78	243.25
Additional Temporary Workspace (CL ROW)	5.63	3.84	0.00	9.75	16.64
Auxiliary Site	104.62	30.10	0.00	33.36	90.65
Temporary Access Road Easement[d]	0.00	5.08	13.44	13.70	15.02
Total Acres	**238.25**	**122.68**	**13.44**	**226.59**	**365.57**

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline (see *Operation of the Project* subsection, below).
[b] CL ROW = centerline of the ROW.
[c] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.
[d] Includes potential site locations in Spread 8
Note: Miles are the same for both temporary and permanent impacts as both are calculated using the pipe centerline

We do not have an estimate of ABB abundance in the immediate area of the Project; however, we do have an assessment of habitat quality. It is reasonable to assume that higher quality, prime habitat would likely support larger numbers of ABB than lower quality marginal habitat. For this reason, we assigned weighted habitat modifiers that were agreed upon by the USFWS, Department, and Keystone during the course of meetings as a way of determining ABB abundance by habitat quality ratings known from along the Project. These habitat modifiers are: prime = 4, good = 3, fair = 2, marginal = 1, poor = 0 (i.e., encountering a beetle in poor habitat is unlikely) and were used to weight higher quality habitats in our calculation. Using the acres (temporary and permanent combined) provided in the Table 9, approximately 38.67 adult ABB may be killed or injured as a result of construction activities in South Dakota (Table 11).

If construction of the pipeline and ancillary areas takes place during the breeding season in mid-summer (i.e., June1 through August 31), as would be expected given the type and extent of the project, larvae and eggs would be destroyed as well as adults. We calculated the amount of anticipated loss as follows:

Assuming a 50:50 sex ratio in the population, there may be 19.33 pairs of ABB affected by construction (38.67/2). Given the typical range of 12-18 larvae per brood, 15 larvae or eggs per pair of ABB (i.e., 290.02 offspring) (19.33 x 15) might be destroyed by construction activities on the ROW and other Project lands in South Dakota. Thus, the total number of ABB destroyed due to Project construction starting during the breeding season (June-August) in South Dakota would be 328.69 ABB (38.67 adults+290.02 offspring). This is the total anticipated number of ABB that

would be expected to be *destroyed* as a result of Project construction because adults and larvae could not be captured and relocated when they would be underground.

Table 11. Estimated number of ABB killed or injured as a result of Keystone XL pipeline construction in Tripp County, South Dakota.

Habitat Quality	Acres Impacted	ABB/Acre	Quality Modifier	Total ABB
Prime	401.8	0.018	4	28.93
Good	117.1	0.018	3	6.32
Fair	80.0	0.018	2	2.88
Marginal	29.9	0.018	1	0.54
Poor	0	0.018	0	0
Total	**628.8**			**38.67**

The USFWS is required to use the best information available in its section 7 consultations, but when estimating ABB densities based on mark-recapture studies, we also recognize that the "best" information available usually includes some uncertainty. Estimates of population densities, in South Dakota, as discussed above, are based on mark-recapture field studies, but these are somewhat dated and should not be compared with the population estimates for Nebraska. Mark-recapture studies estimate the number of animals in a population based on the proportion of marked animals recaptured during a series of trapping efforts. The method has limitations, particularly when wide-ranging and at times, potentially inaccessible (when breeding underground) species such as ABB are involved. Further, ABB are influenced by weather conditions at the time of trapping and other variables and insect populations can be cyclic. These estimates are represented by specific numbers; we recognize that they represent more a sense of scale or magnitude rather than an exact representation of ABB individuals.

Nebraska: The ABB may occur over 47 miles of the proposed pipeline route in Nebraska. However, the number of ABB killed or injured as a result of construction activities is expected to be low due to implementation of pre-construction conservation measures (i.e., especially capture and relocation; and carrion removal, mowing, and windrowing) and because the pipeline was re-routed away from areas known to have suitable habitat and an abundance of ABB in Nebraska.

The mortality of adult ABB caused by construction of the pipeline can be estimated by combining the number of acres affected within the ABB range in Keya Paha and Holt counties in Nebraska (from Table 10, earlier), with the number of ABB estimated to occur per acre as calculated from survey data from Hoback (2012), and then using a habitat quality modifier to adjust for the likelihood of higher numbers of ABB in higher quality habitat using a similar approach as was done in South Dakota and describe above.

For example: 95 ABB/14,000 acres [based on survey data from Hoback (2012) where 28 locations captured 95 ABB and each pitfall trap is assumed to have the effective ABB survey range of 500 acres] = 0.007 ABB estimated per acre.

It is important to point out that 95 ABB captured in Nebraska could vary over time. The number of ABB per trap location in 2012 ranged from 0.2-7.0 and was likely influenced by habitat

suitability, drought conditions, or other ABB life history characteristics including the ability of the species to move and habit of moving underground during reproduction. Modifiers that reflect habitat quality are: prime = 4, good = 3, fair = 2, marginal = 1, poor = 0 (i.e., encountering a beetle in poor habitat is unlikely). Using the acres (temporary and permanent combined) provided in the Table 10, approximately 18.91 ABB may be killed or injured as a result of construction activities in Nebraska (Table 12).

If construction and use of auxiliary areas takes place during the breeding season in mid-summer, larvae and eggs would be destroyed as well as adults. We calculated the amount of anticipated loss as follows:

Assuming a 50:50 sex ratio in the population, there may be 9.45 pairs of ABB affected by construction (18.91/2). Given the typical range of 12 -18 larvae per brood, perhaps 15 larvae or eggs per pair of ABB (i.e., 141.75 offspring) (9.45 x 15) might be destroyed by construction activities on the ROW and other Project lands in Nebraska. Thus, the total number of ABB destroyed if Project construction would have started during the breeding season (June-August) in Nebraska would be 160.66 ABB (18.91 adults+141.75 offspring). Implementation of the capture relocation method prior to construction actions will occur in Nebraska, however, resulting in 141.75 ABB offspring impacted out of the 160.66 ABB total. Most of these impacts will result due to harassment from use of the capture relocation method but also a small amount may also be injured or destroyed by Project construction activities. As a normal part of their life cycle, adult or senescent ABBs die in the fall after they breed. Therefore, these deaths are not included in the calculation of the number of ABB that would be destroyed if construction occurs outside of the breeding season.

Table 12. Estimated number of ABB killed or injured as a result of Keystone XL pipeline construction in Keya Paha and Holt counties, Nebraska.

Habitat Quality	Acres Impacted	ABB/Acre	Quality Modifier	Total ABB
Prime	427	0.007	4	11.96
Good	269	0.007	3	5.65
Fair	13.44	0.007	2	0.19
Marginal	159	0.007	1	1.11
Poor	270	0.007	0	0
Total	**1138**			**18.91**

Capture Relocation Method

Biologists working on ABB have long supported the use of the capture relocation method as an effective ABB avoidance and minimization measure. The capture relocation method has been utilized as an avoidance measure for ABB in Nebraska for several years on large construction projects. The capture relocation method is not a favored practice in South Dakota given public concerns about relocating ABB to areas adjacent to private lands with suitable ABB habitat. Always of concern, however, was the amount of harassment, injury, and mortality that might be associated with use of the capture relocation method. There was a concern that use of this measure may convey as much harm to the species as the project in ABB habitat itself. Recent research,

however, has provided important insight on the effectiveness and level of injury, mortality, and harassment associated with use of the capture relocation method and appears to support its use as an avoidance and minimization measure (Butler 2011; Hoback 2011b, 2012b).

We determined that use of the capture/relocation method in Nebraska is likely to reduce the level of anticipated injury and mortality of ABB (141.75 offspring) resulting from Project construction down to 22.49 ABB (15.03+0.124+7.34). That said, take of ABB through use of the capture relocation method would still occur and this would result in harassment to 119.3 ABB. Essentially, the capture relocation method involves the capture of ABB in a baited pitfall trap and relocation of individuals to suitable habitat that is at least 5 miles away. Recent research shows that there is a level of injury and death that can be expected, however, when using the capture relocation method. However, the level of injury and death that occurs as a part of the method is far less than what might be expected should the capture relocation method not be used. An estimate of the total amount of injury and death can be calculated by considering the effectiveness of the capture/relocation method, estimated injury and mortality associated with use of the capture/relocation method, and estimating level of injury and mortality that might occur once ABB are released at the relocation site.

Method Effectiveness

Butler (2011) indicated that use of the bucket method (used in the capture relocation method) does not result in the removal of 100 percent of ABB from a project site. In that study, it was determined that after 5 days of trapping, 89.4 percent of the burying beetles were removed leaving 10.6 percent of the ABB uncaptured. The likely cause for ABB not being captured is because they are not hungry and therefore not attracted to a bait source.

Thus, 141.75 ABB multiplied by 0.106 gives 126.72 ABB captured and relocated and 15.03 ABB that would likely not be captured at the Project site, but remain there and could be subject to injury or death.

Capture and Handling

Two additional sources of injury or death that must be calculated when using the capture relocation method are the number of the ABB injured or killed due from: a) capture and handling prior to relocation to a suitable habitat and b) relocation and associated intra- and inter-specific competition that may arise over scarce resources (i.e., carrion) and/or predation especially if the ABB is stressed after capture. During 2011, Hoback (2011b) reported that 5 out of 5,106 ABB captured died during the course of capture, but prior to relocation. Hoback (2011b) reported that two ABB were eaten by a shrew, one died and was partially consumed by another ABB (cause of mortality unknown, but possibly due to intraspecific competition with other ABB captured in the bucket), one ABB was eaten by hister beetles (likely due to resource competition), and another was killed by ants.

Thus, 0.000979 ABB would be expected to die during capture and handling prior to relocation (5/5,106). Multiplying 126.72 ABB captured (using the capture/relocation method) by 0.000979 equals 0.124 ABB that would be expected to be injured or die during the capture and handling phase of the capture relocation method, but prior to relocation of individuals. Thus, the resulting number of ABB remaining to be relocated is 126.60 (126.72-0.124).

Fate of Relocated Individuals

It is difficult to determine the injury or mortality that might occur to ABB once individuals are relocated to suitable habitat at least 5 miles from the site of Project disturbance. Stress, intra- and interspecific competition, predation, and other unknown factors might have a negative impact on relocated ABB or there may be no impact. For example, in August intra-specific competition may occur only at feeding sites. During the June activity period, increased competition for available carcasses required by a breeding pair may occur at the relocation sites. In 2012, Hoback (2012b) conducted research on the effect of relocating ABB by comparing the recaptures of a surrogate species *(N. marginatus)* at a control site with recaptures at a relocation site. Although no significant differences were found, mean recaptures of relocated beetles were lower (3.7 percent) than for the control (10 percent) or resident beetles (9.0 percent). Although there was no statistical difference (i.e., no effect found on the ABB resulting from relocation), we decided to utilize data from the study to estimate the level of harassment, injury, and/or mortality that might occur. An average (9.5 percent) was calculated from the control and resident beetles recapture percentages. The amount of take (5.8 percent) that could be expected based on data from a single year of a two-year study was determined by subtracting the 3.7 percent from 9.5 percent.

Thus, multiplying 126.60 (ABB that would be expected to be captured and relocated) by 0.058 equals 7.34 ABB that would be expected to be harassed, injured, and/or killed following the relocation phase of the capture relocation method. A total of 119.26 ABB could be considered successfully captured and relocated (126.60 – 7.34).

We recognize that determining the level of ABB survivorship after individuals are relocated remains difficult. For example, when considering the data from Hoback (2012b), one may also inquire as to the fate of 96.3 percent of the relocated beetles (i.e., 100 percent – 3.7 percent). As a general rule, ABB recapture rates during mark recapture studies shows that recaptures are almost always low. For example, Jurzenski et al. (2011) conducted a mark recapture study to determine the population of ABB in several counties in the Nebraska Sandhills. In that study, 378 individual ABB were captured in 2003, but only 9.1 percent were recaptured in the 10-day surveys. Hoback (2012b) found a 12.7 percent recapture rate for control burying beetles across all sites over a 10-day trapping period following the capture of 25,163 individual *N. marginatus*. Mark recapture and control trials in the aforementioned studies reported low recapture rates *even though the beetles were released where they were captured and they were not relocated to a different location.* We recognize that relocated ABB could be subject to injury or mortality due to increased risk of predation or competition of resources, but beetles may also adapt to relocation sites. Given the Hoback (2012b) and Jurzenski et al. (2011) recapture results, the USFWS believes that ABB survivorship of relocated beetles is high and comparable to non-relocated beetles.

Summary

Thus, a total level of ABB *injury and mortality* resulting from use of the capture relocation method and Project construction in South Dakota and Nebraska is 351.18 ABB. This was determined by summing the effectiveness of the capture/relocation method (possibly 15.03 ABB left at the construction site after capture and relocation), estimated injury and mortality associated with capture and handling prior to relocation (0.124 ABB), and estimated injury and mortality

associated with relocation (7.34 ABB), and take that would be expected to occur in Tripp County, South Dakota (290.02 offspring+38.67 adult ABB). Actual handling of ABB during capture and relocation is a take through *harassment* as defined by section 9 of ESA (see, 50 CFR §17.3). Thus, the take associated with harassment of ABB through use of the capture relocation method in Nebraska is 126.72 ABB. We have concluded that take which occurs as a result of harassment associated with use of the capture relocation method is preferable to take from injury and mortality that would be expected should the capture relocation method not be used. Therefore in summary, the total amount of take that would be expected to occur through use of the capture relocation method and resulting from Project construction is 477.90 ABB. We have determined that this accounts for all sources of take (i.e., harassment, injury, mortality) as defined by ESA. The project will start during the breeding season in South Dakota and thus adults and larvae are included in the take calculation.

In the previously proposed Project, the pipeline route crossed the Nebraska NDEQ-identified Sandhills Region. Surveys of ABBs showed that this area had high densities of ABB which led to a concern that the capture relocation method, which requires five trap nights, might not have been sufficient to capture all the beetles. In circumstances where beetles could not be cleared due to their high abundance, the USFWS and NGPC agreed to include an additional level of take for ABB. Since the new proposed Project avoids the area where ABB are abundant, there is no longer a concern that five trap nights will be inadequate to clear the area of ABBs.

Miscellaneous Impacts of Construction Activities

Artificial lighting during construction has the potential to attract ABB, as they are known to be positively phototrophic. Lights used during nighttime construction can disrupt ABB foraging behavior and increase predation on ABBs. However, lighting used during construction activities would be down-shielded to reduce the level of light pollution from the activity and limit the impacts to ABB to a smaller area. Localized contamination of soil from diesel fuel or oil spills could occur during refueling or maintenance. However, in the event of a spill, Keystone would implement a SPCCP for potential construction-related fuel spills which would mitigate or avoid any short-term impacts (DOS 2012, Appendix D). In addition, ABB would be unlikely to occur in areas that had been stripped of vegetation, such as the ROW or construction yards, where the refueling and maintenance of equipment would be done. Additionally, all fueling vehicles would carry sufficient absorbent material to contain and facilitate removal of up to moderate fuel spills.

Foraging efficiency of local ABBs would be reduced temporarily by construction activities and permanently from habitat fragmentation due to placement of permanent above ground facilities (pump stations in South Dakota and Nebraska). Reduced availability of carrion may result from greater competition for carrion from vertebrate scavengers attracted to edge effect of pipeline facilities.

Operation of the Project

Thermal Effects from Heat Dissipation

Transport of oil through the pipeline creates heat that is dissipated through the soil to the ground surface. A geothermal model was used to predict soil temperature changes at the ground surface and at various depths and distances from the center of the pipeline (Hazen 2011). Combined with

general assumptions about ABB life history, it is possible to estimate whether adverse impacts to ABB would likely result from the increases in soil temperatures caused by operation of the pipeline.

In northern areas of the ABB range, such as Nebraska and South Dakota, soil temperatures decline to below freezing during the winter when the beetles are underground. The ABB 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 ABB would suffer mortality from starvation if they were prohibited from freezing is not known, but the USFWS believes that substantial decreases in the length of time that soil temperatures are below freezing might cause the beetles to use too much fat during the winter months when they are underground. In addition, warming of the soil from the pipeline may also cue the beetles to emerge prematurely (i.e., prior to midnight air temperatures reaching about 60 degrees Fahrenheit (F)). This may result in ABBs coming to the surface when air temperatures preclude foraging activity, or to use more resources to re-bury themselves in the soil, assuming temperatures are warm enough to permit such activity. Additionally, the early emergence of ABB may affect their ability to reproduce successfully because they would temporarily be out of synchrony with the vast majority of ABB in the region (i.e., ABBs overwintering outside the zone of temperature change likely would remain underground for days or weeks until natural environmental cues caused them to emerge).

Impacts from heat dissipation vary with the depth that ABBs overwinter in the soil, and there are a broad range of depths reported in the literature. Schnell et al. (2008) noted in field experiments in Arkansas that ABB overwintered at a depth of 20 cm (approximately 8 inches). However, most information refers to depth of carcass burial associated with reproduction and depths of reproductive chambers are described as "several inches" Ratcliffe (1996, p. 46), or up to 60 cm underground (approximately 24 inches) (Wilson and Fudge 1984, Pukowski 1933, and Hinton 1981; as cited in Scott 1998). The ABB is the largest carrion beetle in North America (Ratcliffe 1996), and Eggert and Sakaluk (2000) found that larger beetles buried carcasses deeper in the soil.

Thermal impacts from operation of the proposed pipeline were evaluated by conducting an analysis of modeled temperature changes (compared to background) at depths of 6 inches, 12 inches and 24 inches, and at various distances from the pipeline center line (Table 13). Two basic soil types at different water saturations were included in the analysis. The temperature modeling predicted that background temperatures (i.e., at 80 feet from the center line of the pipe) would be below freezing during the winter at a depth of 24 inches in all but the driest of the two types of soils (Table 13). In the three sandy soils prevalent in the Sandhills (i.e., SH4, SH5, and SH6), background temperatures at 12 inches depth equaled or fell below 32.0 degrees F. during seven or eight two-week intervals during the winter. However, at 11 feet from the pipe (22-foot-wide sub corridor), soil froze during four and six two-week intervals (i.e., in SH5 and SH6), and not at all in SH4 soils (Table 13). Modeling showed a reduction in the incidence of frozen soil from 25 percent (twice) to 100 percent (twice) at a depth of 12 inches and 11 feet from the pipe center line.

Because the model produces output at two-week intervals, the duration of temperature shifts would likely be substantial, and would adversely affect ABB overwintering at those depths. While acknowledging uncertainties and assumptions associated with the modeling and biology of the ABB, the USFWS nevertheless considers the modeled temperature shifts substantial enough to render habitat out to 11 feet from the pipeline (i.e., a 22-foot width) unsuitable to serve as wintering habitat for the ABB and would be considered a permanent habitat loss. It is possible that

the impact extends beyond the 22-foot width, but 11 feet from the pipe center was the maximum modeled distance that could be compared to background temperatures. Therefore, permanent impacts to ABB habitat from operation of the pipeline include the central 22-foot width affected by the heat generated during pipeline operation along the 87-mile long segment of pipeline located in ABB habitat in South Dakota and Nebraska.

Crude Oil Spills

During operation, the proposed Keystone XL pipeline is considered to be a permanent fixture underground, with operations and maintenance occurring nearly continuously for 50 years. DOS (2012) has stated that adverse effects to ABB resulting from a crude oil spill from the operating pipeline are highly improbable due to: a) the low probability of a spill, b) the low probability of a spill coinciding with the presence of ABBs, and c) the low probability of an ABB contacting the spilled product (DOS 2012).

The spill risk to a species is based upon the length of pipeline crossing its migration habitat/habitat and the spill risk incident rate as described in Section 4.14 of the Draft Supplemental Environmental Impact Statement (DOS 2013). For example, based upon a 119 mile pipeline segment that passes through native grass prairie for Sprague's pipit habitat and an incident spill risk of 0.00025 incident/ mile-year, the estimated spill risk occurrence within the habitat is 34 years or 0.030 incidences per year. For other species along the Proposed route, such as ABB, the distance of a species habitat crossed by the Proposed project route is less than that crossed for Sprague's pipit habitat; therefore, the spill risk occurrence for these other species is lower than the 0.030 incidents per year (i.e., more than 34 years before an incident occurs).

Spill volume cannot be predicted for any species mitigation habitat/habitat; however, because 80% of historical spill volumes are less than 50 barrels (bbls), the probable spill volume could be less than 50 bbls which could result in a radial impact from the pipeline of up to 112 feet (34.1 meters)(DOS 2013).

While there is still a very low probability that individual ABBs would come in contact with the oil from a spill, the more likely affect to ABB would come from soil compaction and soil disturbance during spill clean-up activities. We are not exempting any take due to oil spills because a spill is not reasonably certain to occur. If a spill would occur, however, Keystone should notify the U.S. Environmental Protection Agency (USEPA). The USEPA would consult with the USFWS on spill containment, clean-up, and restoration measures to avoid, minimize, and compensate for impacts to the ABB.

Pump Station Lighting

Lights associated with operation and security of above-ground pump stations may have an adverse effect to ABB. However, only one light above each pump station door would be used during pipeline operation and those lights would be of sodium vapor-type and down-shielded in areas within the range of ABBs in South Dakota (Pump Station 21) and Nebraska (Pump Station 22). Use of sodium vapor-type lights and down-shielding lessens the likelihood that ABB would be attracted to them.

Post-construction and Reclamation

Post-construction activities associated with reclamation, such as grading of lands to approximate pre-construction contours, would not result in additional mortality of beetles on already disturbed lands. On auxiliary lands where the grass may not have been removed, soil compaction from vehicular traffic would have rendered this area unusable for reproduction by ABB (i.e., ABB cannot bury carcasses in compacted soils). Therefore, subsurface tillage of proposed Project lands to loosen compacted soils as part of the reclamation process likely would not result in additional ABB mortality. However, if soil erosion occurs and extends to off-project lands, such erosion may disturb or expose ABB broods or over-wintering adults to adverse environmental conditions if they are displaced. Indirect mortality of eggs and larvae could occur if adults abandon active broods in occupied habitat as a result of disturbance or habitat disruption.

Table 13. The incidence of modeled soil temperatures at freezing or below (i.e., ≤ 32° F. at various distances from pipeline center line, and at different depths. Incidence of temperatures ≤ 32° F. are described in W-X-Y-Z format, where W is the incidence of freezing at the ground surface, X is the incidence of freezing at a depth of 6 inches, Y is the incidence of freezing at 12 inches and Z is the incidence at 24 inches deep. Temperature output is modeled at 2-week intervals. Differences in incidence of frozen soil between background (80 feet) and at 11 feet from the center of the pipe (i.e., a 22-foot width) are shown in bold, red, italics.

	Silty Loam Soil			Sandy Soil		
Distance from Center Line	**SH1**	**SH2**	**SH3**	**SH4**	**SH5**	**SH6**
80 ft. (BkGr)	8-***9***-***6***-0	8-8-***7***-***3***	9-***8***-***8***-***2***	8-***8***-***7***-0	8-***8***-***7***-***4***	9-***8***-***8***-***5***
11 ft.	8-***7***-***0***-0	8-8-***5***-***0***	9-***7***-***6***-***0***	8-***5***-***0***-0	8-***7***-***4***-***0***	9-***7***-***6***-***0***
7 ft.	8-5-0-0	8-6-0-0	7-6-0-0	7-3-0-0	7-5-0-0	7-6-0-0
3 ft.	8-2-0-0	6-0-0-0	5-0-0-0	6-0-0-0	4-0-0-0	4-0-0-0

Regular post-construction maintenance of the ROW through mowing in wooded areas may cause mortality of adult ABB exposed to mowing equipment. However, grassland areas would likely not be mowed as a part of regular maintenance of the ROW (J. Schmidt, pers. comm.). If mowing of the ROW reduces vegetation height to less than 8 inches, the soil may dry to the point that: a) ABBs have difficulty burying carcasses, b) soil may not structurally support reproductive chambers, or c) adult or larval ABB become desiccated (Bedick 2006). Any of these potential consequences of leaving grass and vegetation less than 8 inches tall could adversely affect ABB reproduction.

Exotic, invasive grasses are disruptive to the native ecosystem (Smith and Knapp 2001). Sod-forming, cool season grasses do not promote conservation of the ABB because they slow carcass burial (S. McPherron and W.W. Hoback, pers. comm.). Additionally, genetically modified cultivars of prairie grasses or non-local seed mixes can affect plant community structure, ecosystem function, and the short- and long-term success of grassland restorations (Gustafson et al.

2004; Annese et al. 2006, Martin et al. 2005). For this reason, Keystone will reseed disturbed areas in prime, good, fair, and marginal ABB habitats with a seed mix that matches the Con/Rec designation of the land impacted (see Appendix R of the SDEIS) unless otherwise instructed by the landowner to seed an alternative seed mix. Should the landowner-directed seed mix be determined to not result in full restoration as stipulated in the Reclamation Performance Bond, then the subject acreage amount reseeded will be debited from temporary ABB habitat impacts and credited to permanent ABB habitat impacts and the total amount to the ABB Habitat Conservation Trust will be recalculated.

Effects of Mitigation and Conservation Measures

The following agreements were developed during formal consultation and will go into effect if and only if the Department determines to issue a permit for the proposed Keystone XL pipeline and prior to construction in the states of South Dakota and Nebraska.

Monitoring Program

The Department would retain a third-party contractor to develop and implement an ABB monitoring program or ABB monitoring would be included as a possible wider project level monitoring program for the proposed Project. The program would include monitoring of incidental take of ABB. This monitoring program would be approved and overseen by Department in consultation with USFWS. Keystone would fund the monitoring program prior to construction of the proposed Project.

Monitoring would not replace the environmental quality control plan or the actions that Keystone would put in place, but is in addition to those tasks and would serve as a quality control monitor on behalf of the Department. The monitoring program would include but is not limited to, a combination of site visits, aerial surveillance, and spot checks that would be recorded in monitoring logs with photographs to provide a reasonable level of confidence that avoidance, minimization, and mitigation measures are followed. Monitoring would look at, but is not limited to, replacement of top soil; compliance with seeding specifications and seed mix; erosion control; that construction impacts match permitted footprint, and habitat restoration for the ABB. This monitoring program would identify the number of acres disturbed by the project in the states of South Dakota and Nebraska and the number of acres restored as described in the Reclamation Performance Bond stipulations (Appendix E). The information collected would be used to evaluate whether the impacts to ABB described in this BO are comparable to impacts that result from construction and operation of the proposed Project.

ABB Habitat Conservation Trust

The establishment of an ABB Habitat Conservation Trust as described in Appendix D would offset permanent and temporary losses of ABB habitat in South Dakota and Nebraska at ratios greater than 1:1, and thereby provide long-term benefits to ABB populations in those areas. Land crossed by the pipeline in South Dakota and Nebraska is almost entirely in private ownership. The ABB Habitat Conservation Trust would perpetually protect grasslands through conservation easement or purchase by fee title from willing landowners at ratios greater than 1:1, assuming lands temporarily disturbed are restored to conditions stipulated in the Reclamation Performance Bond (Appendix

E). Protection of privately-owned grasslands at greater than a 1:1 ratio would also incrementally offset habitat loss of grasslands from conversion to agriculture in the South Dakota and Nebraska. The number of acres of prime habitat lost would be mitigated at a 3:1 ratio, and the loss of good habitat would be mitigated at a 2:1 ratio.

These two classifications of quality habitat (combined) comprise 73 percent of the 274.84 acres permanently lost and 68 percent of the 1492.81 acres temporarily lost due to proposed Project construction and operation in South Dakota and Nebraska. Proper management and protection of grasslands through the Habitat Conservation Trust would more than offset permanent and temporary loss of ABB habitat due to construction and operation of the proposed Project and is consistent with recovery actions 1.23 and 5.3 in the Recovery Plan for the ABB (USFWS 1991).

Reclamation Performance Bond

To ensure restoration of disturbed areas within ABB habitat, Keystone would establish a Reclamation Performance Bond that includes the stipulated requirements in Appendix E. Written conditions would ensure this performance bond would be accessible and executed by the Department, or a third party contractor under direction of the Department, in the case that disturbed land in the ABB habitat area, as defined by the 2012 BA (DOS 2012), should fail to re-vegetate in a manner as outlined in Appendix E, <u>and</u> if Keystone fails to take corrective action. Release of funds pursuant to the Bond would be solely at the discretion of the Department after soliciting recommendations from USFWS. The establishment of the Reclamation Performance Bond serves as an additional back-up measure in the Project CMRP which would be undertaken by Keystone to successfully re-vegetate lands temporarily affected by the Project to vegetation conditions in surrounding areas.

Effects of Interrelated and Interdependent Actions

The USFWS is required to evaluate the effects of the action under consideration (i.e., Department potential issuance of a Presidential Permit enabling the proposed Project) "...together with the effects of other activities that are interrelated to, or interdependent with, that action." (50 C.F.R. § 402.02).

Power Lines to Pump Stations and Associated Substations

The construction of power lines to pump stations and the associated substations are interrelated and interdependent actions and may cause adverse impacts to ABB within the range of the species in Nebraska and South Dakota. These impacts might include mortality of ABB during construction of the power lines due to interaction with construction equipment during clearing of vegetation, soil compaction, and during excavation of holes or foundations for the power poles. Restoration of vegetation after construction would not likely cause adverse effects unless grading of undisturbed habitats are involved, and those instances should be infrequent. Maintenance of vegetation under the power lines may also result in ABB injury or mortality if mowing or use of herbicides or pesticides occurs during times when ABB are active above ground.

Only two of the 20 planned power line routes to pump stations would occur within the current occupied range of the ABB: power lines to pump stations 21 and 22 (DOS 2012). The power line

to pump station 21 would be built by Rosebud Electric Cooperative in South Dakota; alignment of that power line is unlikely to have an effect on the ABB given the lack of suitable habitat and anticipated minimal disturbance associated with the proposed power line project. The Nebraska Public Power District and Niobrara Public Power District will construct a power line to provide electrical service to pump station 22. Currently, the length and alignment of that power line is unknown, however, it appears, based on preliminary discussions that the line would be less than 5 miles in length and likely extend along an existing public roadway. Surveys for ABB done in that area did result in captures of the species in low abundance; the habitat in the area is considered marginal because it is partially overgrazed, drought-affected and several center pivots are present to irrigate row crops. Nevertheless, NPPD has agreed, in a letter dated March 4, 2013, to construct the power line during the winter months when the ground is frozen and ABB is inactive and hibernating below the frost line thereby avoiding compaction and negative impacts to the species. It is unlikely that ROW vegetation management would need to occur given that the power line would pass near corners of center pivots irrigation systems and over-grazed pasture. The power lines providing electricity to pump stations 27 and 29 in Kansas will have no effect on the ABB because there is no suitable habitat for the species there.

Big Bend to Witten 230 kV Transmission Line

In South Dakota, the principal population of ABB occurs south of Highway 18 in southern Tripp County. For this reason, impacts to ABB from construction of the pipeline Project were considered only south of Highway 18 (DOS 2012). The Big Bend to Witten 230 kV transmission line in Tripp County, South Dakota, occurs north of Highway 18, outside the southern Tripp County area where ABB occurs in substantial numbers. Therefore, impacts from this interrelated and interdependent Big Bend to Witten transmission line are not likely to result in adverse impacts to ABB.

Bakken Marketlink Project

Aside from the Keystone XL pipeline to transport the oil, this interrelated and interdependent project would consist of piping, booster pumps, meter manifolds, two storage tanks, and one operational tank near Baker, Montana. In addition, the project would include a proposed pipeline, approximately 5 miles long, originating at an existing Montana tank farm facility in Township 7N, Range 58 East, Section 4. The ABB does not occur in Montana, so the Bakken Marketlink Project would have no impact on the ABB.

Cumulative Effects

Cumulative effects are those effects of future, non-federal state, tribal, local government, and private actions that are reasonably certain to occur in the action area considered in this BO. 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.

In addition to those projects with a federal nexus that undergo consultation, there are numerous actions that do not require federal funding, permitting, or authorization and consequently do not require consultation with the USFWS. Any of several private development projects may occur in South Dakota and Nebraska. Examples of these include conversion of native prairie rangeland to cropland.

When large areas of native woodland and native grasslands are affected, loss and fragmentation of these habitats incrementally reduce the recovery potential of ABBs by damaging the functionality of these supporting ecosystems. Philpott (2013) reported 1.3 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 ABB range in Nebraska. For example, one owner of approximately 1,500 acres of grassland in Keya Paha County, Nebraska, converted that grassland to row crops in 2012; in 2013, approximately 720 acres are planned for conversion. Trapping for ABB adjacent to this grassland found low densities of ABB present, but all of the ABB using the converted grasslands would be lost when the grasslands are converted to row crops.

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 impacts to ABBs and their habitat from projects without a federal nexus. All of the above activities can cause loss and further fragmentation of ABB habitat in Nebraska and South Dakota. Construction activities that disturb soils within the current range of ABB cause mortality of ABB adults, and (potentially) ABB larvae and eggs. Although direct mortality of ABB from individual construction activities is local and constitutes a short-term adverse effect, the cumulative loss of ABB 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 ABB are attracted to lights. Future construction and developments of this type by state or private entities may harass the ABB and interfere with feeding or breeding by distracting the species from meeting life requisites.

Conclusion

After reviewing the current status of the ABB, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the USFWS's opinion that the proposed Project is not likely to jeopardize the continued existence of the ABB. "Jeopardize the continued existence of means 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 CFR §402.02). No critical habitat has been designated for this species; therefore, none would be affected. Our determination is based on the following primary factors.

- Since the Recovery Plan was developed in 1991, numerous other populations have been discovered, and the recovery objective of reducing the immediate threat of extinction through discovery or establishment of new populations has been met as discussed in the 5-year review completed for the ABB (USFWS 2008a). Currently, at least four eco-regions support ABB populations estimated at greater than 1,000 individual ABBs (USFWS

2008a). Based on population modeling, K. Holzer, Amaral et al. (eds) (2005) surmised that a population of greater than 1,000 ABB has the potential to remain demographically viable over the long term in the absence of severe catastrophic events or reductions in carrying capacity through reduced carcass availability, habitat loss, or fragmentation.

In 2010, more than 1,000 ABB were trapped in the eastern Sandhills in Holt County, Nebraska with relatively limited trapping. During the course of the ABB capture relocation efforts for the previously proposed Project that were done along the previous route through the Sandhills, 2,486 ABB were captured in Keya Paha, Holt, Garfield, and Wheeler Counties (TransCanada 2011), well exceeding 1,000 individuals needed for a viable population. Trapping of ABB in Tripp County, South Dakota by Backlund et al. (2008) also showed that the population there exceeds 1,000 individuals. These large ABB populations in Nebraska and South Dakota are located in the general Project area and demonstrate the large, apparently viable ABB population that occurs there. Based on these survey results and previous population modeling, we have concluded that the short term loss of ABB at the anticipated levels that are described above, resulting from the proposed Project is not likely to appreciably reduce survival and recovery of the species in the wild.

- The sentinel population of ABB on Block Island off the coast of Rhode Island is stable. The population of ABB in southern Tripp County, South Dakota is thought to be stable, however, this assertion is based on data collected eight years ago, in 2005 (Backlund et al. 2008), which may no longer be representative of the population. We are admittedly concerned about the viability status of this population. However, the USFWS has determined that Backlund et al. (2008) represents the best available scientific information for the ABB population in Tripp County. A large ABB population from the eastern Sandhills of Nebraska is one of the most abundant in the United States. The moderately large Nebraska Loess Hills population was thought to be declining in 2006 and 2007, but that short-term decline was likely caused by the effects of drought on carrion availability (W.W. Hoback, pers. comm.), and that population has increased in recent years with relief from the drought. Additionally, several habitat improvement projects in the Loess Hills have or will soon remove counterproductive red cedars from the Loess Hills, improving ABB habitat there. Population levels of ABB in Oklahoma and Arkansas fluctuate every other year or so, but downward or upward trends in the long term are difficult to ascertain. Fort Chaffee in western Arkansas and Fort Gruber in eastern Oklahoma have robust populations of ABB that, along with populations in Nebraska, are believed to be resilient to the effects of stochastic weather events (USFWS 2008a). Little information is available on trends in the small populations of ABB in Kansas and there is some evidence that a small population of ABB in northern Lamar County, Texas, may be declining (USFWS 2008a). Therefore, although one small population on the periphery of the range may be declining, available evidence indicates that populations of ABB are relatively stable further supporting the assertion that the proposed Project is not likely to appreciably reduce survival and recovery of the species in the wild.

- The loss of ABBs from a limited area in the current range of the ABB known to have a large viable population constitutes a short-term pulse of adverse effect, and has a smaller effect on the species' ability to survive than a longer-term, chronic effect. The proposed Project extends though large grassland areas which provide suitable habitat for ABB. As

such, it is reasonable to expect recolonization of areas that were disturbed during project construction from nearby areas. Additionally, ABB naturally experience fluctuations caused by poor reproduction in some years (e.g., due to weather, disease, etc.), and these short-term stochastic events do not have long-term effects in robust populations like those known in South Dakota and Nebraska. Other factors having little to do with construction and operation of the proposed Project, such as climate change may also affect the ABB in the future. However, for the reasons discussed above, the USFWS has determined that loss of ABB at the anticipated levels is not likely to appreciably reduce survival and recovery of the species in the wild.

- The cumulative effect of loss of ABB habitat from the conversion of grasslands to cropland in Nebraska and South Dakota and multiple development projects may eventually reduce the ability of a given ABB population to survive and recover in a fragmented landscape. We remain concerned about the effects of the large acreages of grasslands converted to corn and soybeans in Nebraska and South Dakota (Philpott 2013) on ABB populations. However, this level of cumulative impact apparently has not yet been reached in Nebraska and South Dakota, where ABB population levels (as shown from survey efforts) appear healthy and stable in a landscape that still consists of broad areas of native grassland. Thus, based on the best available information, current levels of moderate to high quality ABB habitat are supporting populations of ABB across the vast majority of its current range. For this reason, we have concluded that loss of ABB due to cumulative impacts is not likely to appreciably reduce survival and recovery of the species in the wild. And, for the reasons stated above, we do not believe that any loss from these cumulative effects combined with the loss from the proposed Project, is likely to jeopardize the ABB.

- A total of approximately 274.84 acres of ABB habitat would be permanently lost in South Dakota (Table 9) and Nebraska (Table 10) of which 73 percent of the same or 201.10 acres are classified as prime or good ABB habitat. Of the 1,492.81 acres of ABB habitat temporarily lost in South Dakota (Table 9) and Nebraska (Table 10) due to construction of the proposed Project, 1013.91 acres, or 68 percent is categorized a prime or good ABB habitat. However, the loss of this amount of habitat spread over approximately 82 miles of ROW (35 miles in South Dakota + 47 miles in Nebraska) and areas under isolated pump stations does not constitute a significant portion of available habitat for ABB breeding, feeding and sheltering. To put these figures into perspective, in Nebraska and South Dakota, this combined acreage represents, 0.071 percent of grasslands (1492.81/2,098,876) in the counties with ABB affected by the Project (i.e., Holt County (1,184,143 grassland acres) Keya Paha County (398,016 grassland acres), and Tripp County (516,717 grassland acres south of Highway 18)) that would be temporarily lost. Similarly, 0.013 percent of the grasslands (274.81/2,098,876) in the same area would be permanently lost. Given this acreage comparison, we have determined that these permanent and temporary habitat losses would not appreciably reduce the likelihood of survival and recovery of the ABB.

Conservation measures included as part of the Keystone XL Project especially the ABB Habitat Conservation Trust (Appendix C) would likely result in a net increase in protected ABB habitat. The Reclamation Performance Bond (Appendix E) would provide assurances that disturbed habitat would be restored following proposed Project construction. Within the context of stable or increasing populations in the northern portion of the species range, an increase in protected ABB

habitat in an area where a portion of unprotected habitat may be lost through conversion to agriculture would improve the likelihood of survival and recovery of the species. Establishment of the ABB Habitat Conservation Trust and the habitat protection it would enable are consistent with recovery actions 1.23 and 5.3 in the recovery plan (USFWS 1991). Protection of privately-owned grassland habitat that is vulnerable to loss through conversion to agriculture would be particularly beneficial and facilitate survival and recovery of the species in the northern portion of the species range. Protection of privately-owned grassland habitat that is vulnerable to loss through conversion to agriculture would be particularly beneficial and facilitate survival and recovery of the species in the northern portion of the species range. Thus, these conservation measures contribute to the recovery of the ABB.

The combination of the ABB monitoring program (Appendix C) and the Reclamation Performance Bond (Appendix E) would provide assurances that the acres disturbed by the Project would be restored appropriately. A 1:1 ratio (i.e., 3:1 or 2:1 for prime and good habitat, respectively) habitat mitigation ratio would be applied to supplemental vegetation reclamation if restoration for ABB habitat failed and Keystone fails to take corrective action. These actions are also consistent with recovery actions 1.23 and 5.3 in the recovery plan (USFWS 1991).

In Nebraska, trapping and relocating of ABB from Project lands, followed by measures to discourage reestablishment of ABB on Project lands prior to pipeline construction (e.g., carrion removal, mowing, and windrowing), would substantially reduce injury and mortality of ABB caused by construction and operation of the pipeline. Based on our calculations, 119.26 ABB would be successfully removed from Project lands using the capture relocation method, and moved to prime or good habitats at release sites known to be occupied by the species. Procedures implemented at the release site further promote ABB survival and success at their new location. These measures would minimize adverse effects to survival of the ABB population in Nebraska.

In summary, after reviewing the effects of the action, including the effects of interrelated and interdependent activities, and any cumulative effects on the ABB, we conclude that the reproduction, numbers, or distribution, of the ABB will not be reduced in such a manner that would reduce appreciably the survival and the recovery of the ABB.

Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without 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 further defined by the USFWS 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 such as breeding, feeding, or sheltering. Harass is defined by the USFWS as 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. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered

to be prohibited under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the Department so that they become binding conditions for any action, grant, or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The Department is the lead agency with oversight of the activity covered by this incidental take statement. If the Department: (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Department must report the progress of the action and its impact on the species to the USFWS as specified in the Incidental Take Statement. [50 C.F.R § 402.14(i) (3)].

Amount and Extent of Incidental Take Anticipated

Anticipated Take from Pre-construction Activities

Incidental take of ABB associated with implementation of the pre-construction capture relocation method in Nebraska will result in the take through *harassment* of 126.72 or 127 ABB in Nebraska (141.75 x .106) (see previous section: Capture Relocation method).

Anticipated Take from Construction and Operation Activities

Incidental take in the form of *mortality or injury* of individual ABBs is likely to occur as a result of the proposed Project construction in South Dakota and Nebraska; injury and mortality could also result from use of the capture relocation method in Nebraska. We calculated a total of 351.18 or 352 ABBs that would be injured or die from capture and relocation in Nebraska and construction in both Nebraska and South Dakota.

The USFWS requires that incidental take of ABB be monitored during the Project using survey methods advocated by the USFWS and NGPC (2008) by comparing the number of ABB captured during surveys done immediately before Project construction (within 9 months; should construction begin in May, surveys would be done the previous August while ABB is active) with the number of ABBs used for calculating the incidental take (39 individual ABBs (see Table 11) and 19 individual ABBs (see Table 12)), the previously calculated level of take for adults expected in the South Dakota and Nebraska segments of the Project, respectively. Results of the Pre-construction surveys should be run through the calculations in Table 11 and 12 and then the comparison should be made. These figures are not inclusive of ABB eggs or larvae because of their difficulty in detection when underground.

Reasonable and Prudent Measures (RPMs) to Minimize Incidental Take, and Corresponding Terms and Conditions for the RPMs

The USFWS believes the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of the ABB. In order to be exempt from the prohibitions of section 9 of the Act, Keystone and its contractors must comply with the terms and conditions, which implement the reasonable and prudent measures and outline required reporting requirements. These terms and conditions are non-discretionary.

RPM 1: Injury and mortality that occurs during the capture relocation method can be minimized to the extent possible through the use of knowledgeable field technicians experienced in the use of the American Burying Beetle Trapping Protocol, Conservation Measures, Distribution Map, and Qualification Criteria (Appendix B).

Terms and Conditions for RPM 1:

1(a): Only field technicians who have been trained and have experience trapping and relocating ABB according to the approved protocols (Appendix B) will participate in the pre-construction "clearing" effort in Nebraska. Keystone must submit in writing to the Nebraska Field Office USFWS how field technicians meet the ABB Qualification Criteria, April 2012 (USFWS 2012).

1(b): The trapping and relocation protocols will be consistently followed. These protocols are described in two December 2008 documents in Appendix B: "American Burying Beetle - Nebraska Trapping Protocol" and "Conservation Measure for the American Burying Beetle (ABB)," developed by the USFWS and NGPC. If any deviations from the protocol are necessary due to unforeseen circumstances, a change in field activity may be made only after consultation with both the USFWS Nebraska Field Office and the NGPC.

1(c): ABB must be relocated to good or prime rated habitat a distance of three to five miles from the point of capture.

1(d): To reduce the potential for post-release, intra-specific competition for carrion at relocation sites, no more than 50 beetles will be released at any re-location site, and the release site will be at least three to five miles from the capture site.

1(e): All injuries or deaths of ABBs will be recorded along with apparent cause of mortality at the time of observation, and reported immediately to Mike Fritz at the NGPC (phone 402-471-5419), and Robert Harms at the USFWS (phone 308-390-0871). Following the capture relocation effort, a report will be submitted to the Nebraska Field Supervisor, USFWS, and to the NGPC by October of the trapping year, documenting the trapping, relocation, and habitat maintenance (of cleared sites) activities. The report would include, at a minimum, a summary of mortality by age class (e.g., senescent or teneral) and site, number and age class (e.g., senescent or teneral) of ABB captured per trap night, and average catch per trap night per pipeline mile post and other Project land, and whether the site was "cleared." Where, when, and at what distance ABB were released with a habitat rating of all release sites would also be documented, along with a description of post-clearing habitat modification activities.

1(f): The Department designated point of contact would contact the USFWS point of contact when the Reasonable and Prudent Measures and Terms and Conditions set forth in the USFWS's BO are not being met to remedy the situation(s). Reinitiation of consultation will occur if incidental take associated with the capture and relocation method exceeds 10 ABB in 2013 and 10 ABB in 2014 in Nebraska. This level of take was previously developed by biologists familiar with the population and life history of the ABB in Nebraska and are included in individual recovery permits for the ABB in Nebraska.

RPM 2: Incidental take of ABBs will be monitored during Project construction.

Terms and Conditions of RPM 2:

2(a): Pre-construction ABB surveys will be conducted (within 9 months; should construction begin in May, surveys would be done the previous August while ABB is active) from pipeline mile post 566 to 600 in Tripp County, South Dakota and from mile post 600 to 659 in Keya Paha and Holt counties in Nebraska, the pipeline segment where ABB is known to occur. ABB surveys will be conducted in accordance with ABB survey protocols in Appendix B.

2(b): Results of the Pre-construction ABB surveys will be compared to the calculated amount of individual ABBs that would be taken in South Dakota (39 individual ABBs from Table 11) and Nebraska (19 individual ABBs from Table 12).

2(c): The Department designated point of contact would contact the USFWS point of contact when the Reasonable and Prudent Measures and Terms and Conditions set forth in the USFWS's BO are not being met to remedy the situation(s). Reinitiation of consultation will occur should ABB numbers resulting from Pre-construction surveys (following the calculation method in Tables 11 and 12) exceed the estimates of take calculated for South Dakota (39 individuals) or Nebraska (19 individuals).

RPM 3: Keystone will use restoration methods described in Appendix A of the BA, in conjunction with agreements developed with the USFWS and NGPC, to restore lands to the condition of adjacent land as they were found immediately prior to construction and within a time frame between May 15, 2013 and May 15, 2014 on Project ROW and work areas.

Terms and Conditions of RPM 3:

3(a): By October 1 of each year after construction, the Department would submit an annual monitoring report to the USFWS documenting the monitoring accomplished and progress of restoration of Project lands. The report would detail and document the number of acres affected by Project activities, and the number of acres meeting reclamation stipulations of the bond [Appendix E]). At the end of this Agreement, all original files and documents would be provided to the USFWS.

3(b): The Department designated point of contact would contact the USFWS point of contact when the Reasonable and Prudent Measures and Terms and Conditions set forth in the USFWS's BO are not being met and work with the Department to remedy the situation(s). Reinitiation of consultation will occur if the number of acres of ABB habitat permanently lost within the current range of the species (i.e., as calculated in the effects section of this BO - 593.1 acres) plus the number of acres in the same areas where restoration (as defined by Reclamation Bond stipulations) fails to occur by the fall of post-construction year 8, is greater than anticipated in this BO.

RPM 4: The ABB avoidance and minimization measure benefits will be maximized to reduce impacts to adult ABB; and young-of-the-year ABB which comprise the following years breeding individuals.

Terms and Conditions of RPM 4:

4(a): In Nebraska, the capture relocation method will be implemented prior to the start of Project construction.

4(b): Where capture and relocation efforts have not been completed, the proposed Project will not start during the ABB breeding season in Nebraska which extends from June 1 through August 31.

Conservation Recommendations

1. Conduct research on the ABB coordinated with the USFWS. For example, provide funding to: a) monitor use of restored Project lands by ABB or, b) evaluate success of various vegetation restoration methods or, c) investigate the effect of soil compaction on non-endangered burying beetles or, d) measure the actual temperature increases surrounding the operating pipe to determine accuracy of modeled temperature dissipation around operating pump or, conduct an ABB mark recapture study on ABB in South Dakota to assess the viability of the population.

2. The Department can promote actions supporting conservation of ABB through its responsibilities under section 7(a) (1) of the Act.

3. Minimize habitat loss and alteration by minimizing soil disturbance to the extent feasible, utilizing existing roads, staging areas, etc.

4. Develop educational/informational materials, with the assistance of the USFWS, for placement onsite to inform visitors of the potential ABB presence in the area, encourage reporting of sightings, and potentially reduce the risk of potential disturbance scenarios.

Closing Statement

This concludes formal consultation on the actions outlined in the December 21, 2012, request from the Department for formal consultation on the construction and operation of the Keystone XL pipeline, as described in the Final Biological Assessment and subsequent additions/amendments to same. 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, especially as this information relates to climate change and the ability of ABB to overwinter and tolerate dryer environments over the next 50 years (i.e., the life of the Project); 3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action.

The USFWS appreciates the cooperation extended by the Department, Keystone, Hoback Consulting, and multiple USFWS Ecological Services Field Offices and State resource agencies in this consultation. If further assistance or information is required, please contact Mr. Robert R. Harms or me at the above address or telephone (308) 382-6468.

Sincerely,

Michael D. George
Nebraska Field Supervisor

cc: Regional Director, USFWS, Denver, CO

Literature Cited

Avian Power Line Interaction Committee (APLIC). 2012. Reducing Avian Collisions with Power Lines: The State of the Art in 2012. Edison Electric Institute and APLIC.Washington, D.C.

Amaral, M., A.J. Kozol, and T. French. 1997. Conservation strategy and reintroduction of the endangered American burying beetle. Northeastern Naturalist 4(3): 121-132.

Amaral, M., Morgan, R., Davidson, C., Dikeman, H., Holzer, K., and 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. 77pp.

Anderson, R.S. 1982. On the decreasing abundance of *Nicrophorus americanus* Olivier (Coleoptera: Silphidae) in eastern North America. The Coleopterists Bulletin 36: 362-365.

Annese, V., E. Cazzato, A. Corleto. 2006. Quantitative and qualitative traits of natural ecotypes of perennial grasses (*Dactylis glomerata* L., *Festuca arundinacea* Schreb., *Phalaris tuberosa* L., *Brachypodium ruestre* (Host) R. et S.) collected in southern Italy. Genetic Resources and Crop Evolution. 53(2): 431-441.

Backlund, D.C., G.M. Marrone, C.K. Wouldiams, and K. Tillman. 2008. Population Estimate of the Endangered American Burying Beetle, *Nicrophorus americanus*, Olivier (Coleoptera: Silphidae) in South Dakota. Coleopterists Bulletin 62(1): 9-15.

Backlund, D.C. and G. M. Marrone. 1995. Surveys for the endangered American burying beetle (*Nicrophorus americanus*) in Gregory, Tripp and Todd Counties, South Dakota. Final rep. to the Service, Pierre, SD. 12 pp. Unpub. MS.

Backlund, D.C., and G.M. Marrone. 1997. New records of the endangered American burying beetle, *Nicrophorus americanus* Olivier, (Coleoptera: Silphidae) in South Dakota. Coleopterists Bulletin 51(1): 53-58.

Backlund, D. and G. Marrone. 2003. Monitoring Surveys for the American Burying Beetle (*Nicrophorus Americanus*) in Tripp and Gregory County, South Dakota.

Bartlett, J. 1987. Evidence for a sex attractant in burying beetles. Ecological Entomology 12: 471-472.

Bedick, J.C., Brett C. Ratcliffe, W. Wyatt Hoback, and Leon G. Higley. 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.

Bedick, J.C., B.C. Ratcliffe, and L.G. Higley. 2004. A new sampling protocol for the Endangered American burying beetle, *Nicrophorus americanus* Olivier (Coleoptera: Silphidae). The Coleopterist Bull. 58(1): 57-70.

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.

Butler, S, R. 2011. Tests of Marking Methods and Survey Protocols for Burying Beetles (Coleoptera: Silphidae). MS Thesis, University of Nebraska-Kearney. 100 pp.

Carlton, C.E. and F. Rothwein. 1998. The endangered American burying beetle, *Nicrophorus americanus* Olivier, at the edge of its range in Arkansas (Coleoptera: Silphidae). Coleopterists Bulletin 52: 179-185.

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: 275-277.

Creighton, J.C. and G. Schnell. 1998. Short-term movement patterns of the endangered American burying beetle *Nicrophorus americanus*. Biological Conservation 86: 281-287.

Creighton, J.C., R. Bastarache, M.V. Lomolino, M.C. Belk. 2007. Effect of forest removal on the abundance of the endangered American burying beetle, Nicrophorus americanus. J Insect Conserv, Published online: 16 October 2007.

Eggert, A. and S.K. Sakaluk. 2000. Benefits of communal breeding in burying beetles: a field experiment. Ecological Entomology 25: 262-266.

Ellsworth, J.W. and B.C. McComb. 2003. Potential effects of passenger pigeon flocks on the structure and composition of presettlement forests of eastern North America. Jour. Of Cons. Biol. 17(6): 1548-1557.

exp Energy Services Inc. 2012. TransCanada Keystone XL Pipeline Project: Environmental Report. September 7, 2012.

Fetherston, I.A., M.P. Scott, and J.F.A. Traniello. 1990. Parental care in burying beetles: The organization of male and female brood-care behavior. Ethology 85:177-190.

Floyd, R.P. 1978. Geodetic benchmarks. NOAA Manual NOS NGS 1. National Oceanic and Atmospheric Administration, Rockville, Maryland. September, 1978.

Garrott, R. A., White P.J., and Vanderbilt White C.A. 1993. Over-abundance: An Issue for Conservation Biologist? Conservation Biologist 7: 946-949.

Godwin, Wouldiam B. 2003. Report of the discovery of the American burying beetle (*Nicrophorus americanus* Oliver) at the Texas Army National Guard facility Camp Maxey, Lamar County, Texas. Unpub. MS.

Gustafson, D.J., D.J. Gibson, D.L. Nickrent. 2004. Competitive relationships of *Andrpogon gerardii* (Big Bluestem) from remnant and restored native populations and select cultivated varieties. Functional Ecology. 18: 451-457.

Hazen, B. 2011. Geothermal model predictions for the sandhills segment of the Keystone XL pipeline. Unpublished report, February, 2011. Model used: "TQUEST, A General Purpose, Finite-Element Program for One, Two and Three Dimensional Heat Transfer." Prepared for TransCanada Keystone Pipeline, LP by Northern Engineering and Scientific, Anchorage, Alaska.

Hoback, W.W. 2008. Seasonal Activity and Effects of Vegetation on Soil Use by the American Burying Beetle, *Nicrophorus americanus,* Unpublished Report, University of Nebraska at Kearney.

Hoback, W.W. 2011a. 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 Oklahoma. Revision 3. February 2011. Prepared for Keystone XL Pipeline Project.

Hoback, W.W. 2011b. Annual Report for American Burying Beetle Recovery Permit. U.S. Fish and Wildlife Service, Grand Island, NE.

Hoback, W.W. 2012. August Survey Report, Results of survey for American burying beetle, *Nicrophorus americanus*, in Northern Keya Paha, Western Boyd, Eastern Holt, and Antelope counties.

Hoback, W.W. 2012b. Report of Summer 2012 trials to test the effects of trap and relocate on burying beetles. University of Nebraska-Kearney. Project done under FWS Cooperative Agreement, U.S. Fish and Wildlife Service, Grand Island, NE.

Hoback, W.W., S. Butler, and A. Conley. 2012. Trap and Relocate effects and impact of vehicles on American burying beetle. Quarterly Report. September 15, 2012. Federal Highway Administration/Nebraska Department of Roads, Lincoln, NE.

Jurzenski, J. and W.W. Hoback. 2010. Updated distribution of American burying beetle in Nebraska and predictive model for its occurrence. Unpubl. report prepared for the U.S. Fish and Wildlife Service, Nebraska Field Office, Grand Island.

Jurzenski, J., D.G. Snethen, M. Brust, and W.W. Hoback. 2011. New Records of Carrion Beetles in Nebraska reveal increased presence of the American burying beetle, *(Nicrophorus americanus)* Olivier (Coleoptera: Silphidae). Great Plains Research 21:131-143.

Kozol, A.J., M.P. Scott, and J.A. Traniello. 1988. The American burying beetle: studies on the natural history of an endangered species. Psyche 95: 167-176.

Kozol, A.J. 1990a. *Nicrophorus americanus* 1989 laboratory population at Boston University. Report prepared for the Service, Concord, NH. Unpub. MS.

Kozol, A.J. 1990b. The natural history and reproductive strategies of the American burying beetle, *Nicrophorus americanus*. Report to the Service, Hadley, MA. Unpub. MS.

Kozol, A.J. 1991. Annual monitoring of the American burying beetle on Block Island. Report to The Nature Conservancy, 294 Washington Street, Boston, Massachusetts. Unpub. MS.

Kozol, A.J. 1995. Ecology and population genetics of the endangered American burying beetle, *Nicrophorus americanus*. Dissertation, Boston University, Massachusetts.

Lomolino, M.V., J.C. Creighton, G.D. Schnell, and D.L. Certain. 1995. Ecology and conservation of the endangered American burying beetle, *Nicrophorus americanus*. Conservation Biology 9: 605-614.

Lomolino, M.V. and J.C. Creighton. 1996. Habitat selection, breeding success and conservation of the endangered American burying beetle, *Nicrophorus americanus*. Biological Conservation 77: 235-241.

Martin, L.M., K.A. Moloney, and B.J. Wilsey. 2005. An assessment of grassland restoration success using species diversity components. Journal of Applied Ecology 42: 327-336.

Matthews, C.Y. 1995. Interspecific competition between the burying beetles *Nicrophorus americanus* and *Nicrophorus orbicollis*. M.S. Thesis, Univ. of Oklahoma, Norman. 32 pp.

Miller, B., Biggins D. and Reading R. 1990. A proposal to conserve black-footed ferrets and the prairie dog ecosystem. Environmental Management 14: 763-769.

Nebraska Game and Parks Commission and U.S. Fish and Wildlife Service. 2008. American Burying Beetle, Nebraska Trapping Protocol, Lincoln, Nebraska and Grand Island Nebraska. 5pp.

Nebraska Game and Parks Commission. 2013. Detection Probability Analysis for Western Prairie Fringed Orchid. Nebraska Heritage Database. Lincoln Nebraska.

Peck, S.B. and M.M. Kaulbars. 1987. A synopsis of the distribution and bionomics of the carrion beetles (Coleoptera: Silphidae). Proceedings of the Entomological Society of Ontario. 118: 47-81.

Pukowski, E. 1933. Okoloische untersuchungen an Necrophorus F. Z. Morphol. Okol. Tiere. 27: 518-586.

Raithel, C.J. 1996-2002. Monitoring and management of American burying beetles in Rhode Island. Section 6 Performance Reports, no. E-17-27 submitted to Service, Hadley, MA. Unpub. MS.

Ratcliffe B. 1995. Nebraska's threatened and endangered species: American burying beetle. Nebraska Games and Parks commission. Unpub. MS.

Ratcliffe, B.C. 1996. The carrion beetles (Coleoptera: Silphidae) of Nebraska. Bulletin of the Nebraska State Museum Vol. 13.

Schnell, G. D., A.H. Hiott and V. Smyth. 1997-2003. American burying beetle survey, Camp Gruber, Oklahoma. Sam Noble Oklahoma Museum of Natural History, Norman, Oklahoma. Final rep. to Camp Gruber National Guard Training Center. Unpub. MS.

Schnell, G. D., A.H. Hiott and V. Smyth. 1997-2006. Evaluation of American burying beetles on the Weyerhaeuser Habitat Conservation Plan Area. Final rep. to Weyerhaeuser Company. Unpub. MS.

Schnell, G.D., A. E. Hiott, J.C. Creighton, V.L. Smyth, and A. Komendat. 2007. Factors affecting overwinter survival of the American burying beetle, Nicrophorus americanus (Coleoptera: Silphidae). Journal of Insect Conservation DOI 10.1007/s10841-007-90865.

Schnell, G.D., A.E. Hiott, and J.C. Creighton. 2008. Factors affecting overwinter survival of the American burying beetle, Nicrophorus americanus (Coleoptera: Silphidae). Journal of Insect Conservation 12: 483-492.

Schwelling, S.R., P.S. Showalter, J.R. Singhurst, and C.D. German. 2000. Habitat prediction for Texas trailing phlox (*Phlox nivalis* ssp. *texensis*) using Landsat Thematic Mapper and ancillary biophysical data. [online] http://cswgcinnew/dm/Phlox/p120.html. Accessed 2003.

Scott, M.P. 1990. Brood guarding and the evolution of male parental care in burying beetles. Behavioral Ecology and Sociobiology 26: 31-39.

Scott, M.P. and J.F.A. Traniello. 1987. Behavioral cues trigger ovarian development in the burying beetle *Nicrophorus tomentosus*. J. Insect Physiol. 33: 693-696.

Scott, M.P. and J.F.A. Traniello. 1989. Guardians of the underworld. Natural History 6: 32-36.

Scott, M.P. 1998. The ecology and behavior of burying beetles. Annual Review of Entomology 43: 595-618.

Sikes, D.S. and Christopher J. Raithel. 2002. A review of hypotheses of decline of the endangered American burying beetle (Silphidae: *Nicrophorus americanus* Olivier). Journal of Insect Conservation 6: 103-113.

Smith, M.D. and A.K. Knapp. 2001. Physiological and morphological traits of exotic, invasive exotic, and native plant species in tallgrass prairie. International Journal of Plant Science. 162(4): 785-792.

TransCanada. 2011. Summary of August 2011 American burying beetle trap and relocate efforts in Nebraska for the Keystone XL Pipeline Project – Steele City Segment. TransCanada Keystone Pipeline, LP, Houston, TX.

Trumbo, S.T. 1990. Reproductive success, phenology, and biogeography of burying beetles (Silphidae, *Nicrophorus*). American Midland Naturalist 124(1): 1-11.

Trumbo, S.T. 1992. Monogamy to communal breeding: exploitation of a broad resource base by burying beetles (*Nicrophorus*). Ecological Entomology 17: 289-298.

United States Department of State (DOS). 2011. Keystone XL Project Final Biological Assessment. Issued May 19, 2011. 139 pp. plus appendices.

United States Department of State (DOS). 2012. Keystone XL Project Final Biological Assessment. Issued December 21, 2012. 202 pp. plus appendices.

United States Department of State (DOS). 2013. Draft Supplemental Environmental Impact Statement Keystone XL Project. Issued March 1, 2013.

United States Fish and Wildlife Service (USFWS). 1989. Black footed ferret survey guidelines for compliance with the Endangered Species Act. Denver Colorado and Albequerque, New Mexico. April 1989. 10 pp.

United States Fish and Wildlife Service (USFWS). 1991. American burying beetle (*Nicrophorus americanus*) recovery plan. Newton Corner, Massachusetts. 80 pp.

United States Fish and Wildlife Service (USFWS). 2008a. Five-year review of the status of the American Burying Beetle. June 16, 2008. Southwest Regional Office, Albuquerque, New Mexico.

United States Fish and Wildlife Service (USFWS). 2008b. December 8, 2008 letter to Kimberly D. Bose, Federal Energy Regulatory Commission, transmitting its biological opinion regarding construction and operation of the Arkoma Connector Pipeline in Atoka, Coal, and Bryan counties, Oklahoma, by MarkWest Pioneer, L.L.C.

United States Fish and Wildlife Service (USFWS). 2012. American Burying Beetle Qualification Criteria, April 2012, Oklahoma Ecological Services Field Office.

United States Fish and Wildlife Service (USFWS). 2012b. Technical Assistance Letter for the TransCanada Keystone XL Pipeline, Nebraska Ecological Services Field Office, Grand Island, Nebraska.

United States Global Change Research Program (USGCRP). 2009. Global Climate Change Impacts in the U.S.

Walker, T.L. and W. Hoback. 2007. Effects of invasive eastern red cedar on capture rates of *Nicrophorus americanus* and other Silphidae. Env. Entolol. 36(2): 297-307.

Wilcove, D.S., C.H. McLellan, and A.P. Dobson. 1986. Habitat fragmentation in the temperate zone. In M.E. Soule (ed.), Conservation Biology: The Science of Scarcity and Diversity, pp. 237-256. Sinauer Associates, Sunderlan, MA.

Wilson, E.O. 1971. The Insect Societies. Harvard University Press, Cambridge, MA.

Wilson, D.S. and J. Fudge. 1984. Burying beetles intraspecific interactions and reproductive success in the field. Ecological Entomology 9: 195-203.

References/Personal Communication

Bessken, Charlene. USFWS, South Dakota Field Office, Pierre, South Dakota. Personal communication, October, 2010.

Carlton, C.E. <ccarlton@fs.fed.us>, Fire ants in Arkansas, April 3, 1996, E-mail correspondence to Michael Amaral, USFWS, Concord, NH, regarding county by county American burying beetle surveys and fire ants in Arkansas, 2 pp. Personal communication, December 8, 2008.

Graham, Kyle J. USFWS, Fort Niobrara National Wildlife Refuge, Valentine, Nebraska. Personal communication, March 2011.

Hoback, W. Wyatt. University of Nebraska – Kearney. Personal communication, March 24, 2011.

Nebraska Public Power District. Letter dated March 4, 2013, NPPD Keystone XL T&E Species Request Response. Columbus, Nebraska.

R.R. Harms. U.S. Fish and Wildlife Service, Personal communication, March 2013

S. McPheron, University of Nebraska – Kearney. Personal communication, March 24, 2011.

PhilPott, T. 2013. King corn mowed down 2 million Acres of grassland in 5 years flat. MotherJones.News. Accessible at http://www.motherjones.com/tom-philpott/2013/02/king-corn-gobbles-climate-stabilizing-grassland-midwest

Pore, Robert. Study: Ethanol growth has influenced cropping practices. Grand Island Independent, August 28, 2011. (Newspaper article).

Smith, Amy. Smith Environmental and Research Consulting House LLC. Personal communication. April 24, 2013.

U.S. Department of the Interior. October 3, 2008, Memorandum from the Office of the Solicitor to the Secretary of the Interior. Guidance on the Applicability of the Endangered Species Act's Consultation Requirements to Proposed Actions Involving the Emission of Greenhouse Gases. Office of the Solicitor.

U.S. Fish and Wildlife Service. May 14, 2008, Memorandum from Director Dale Hall to Regional Directors 1-8. Expectations for Consultations on Actions that Would Emit Greenhouse Gases. U.S. Fish and Wildlife Service, Washington D.C.

U.S. Government Accounting Office (GAO). Interim Results: Impact of USDA payments and Sodbuster on grassland conversions to grassland. Briefing for staff of Senator Tom Harkin, Chairman, Senate Committee on Agriculture, Nutrition, and Forestry; and Representative Collin Peterson, Chairman, House Committee on Agriculture. May 24, 2007.

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Appendix A

Project Maps

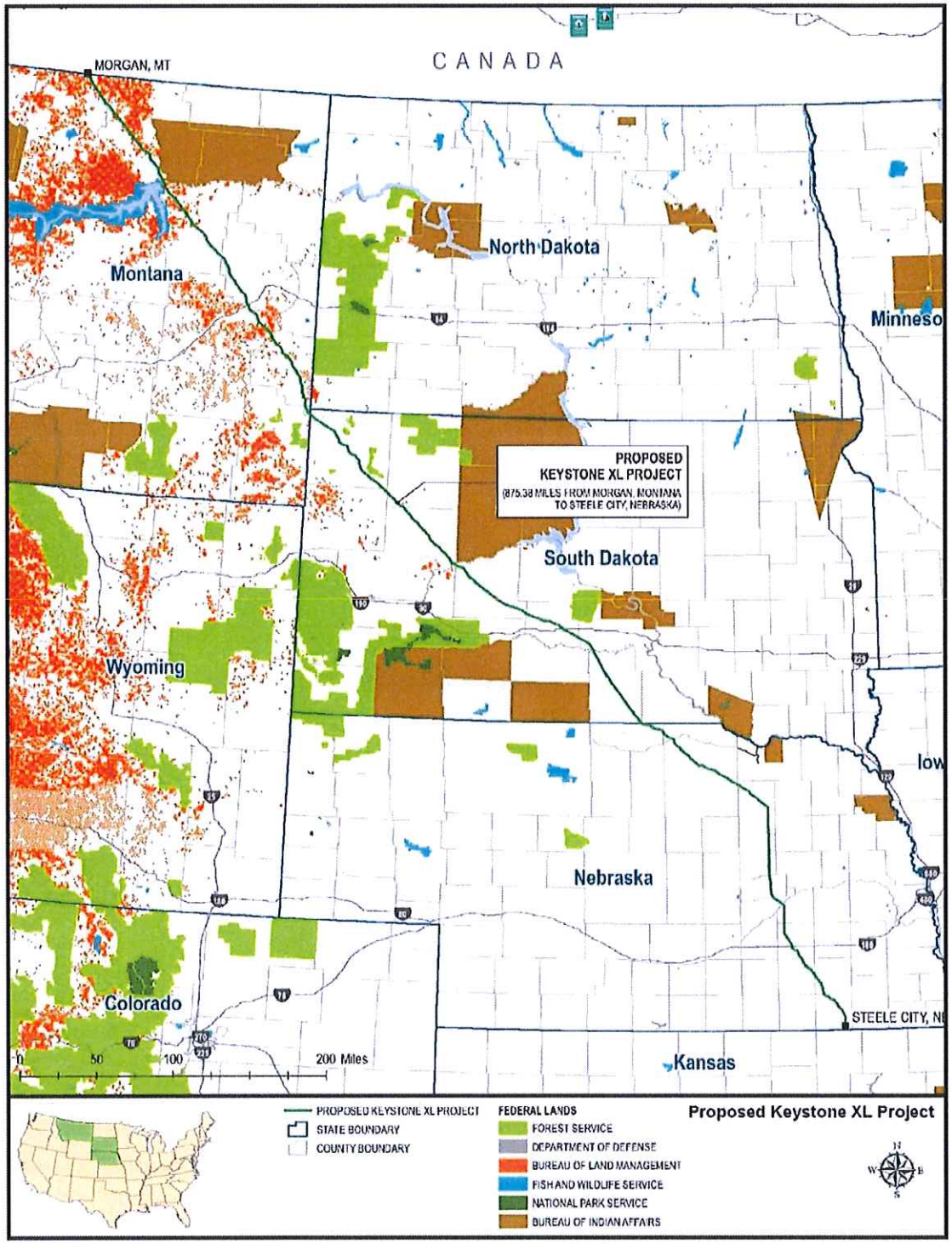

Figure 1. Overview of Keystone Pipeline Project

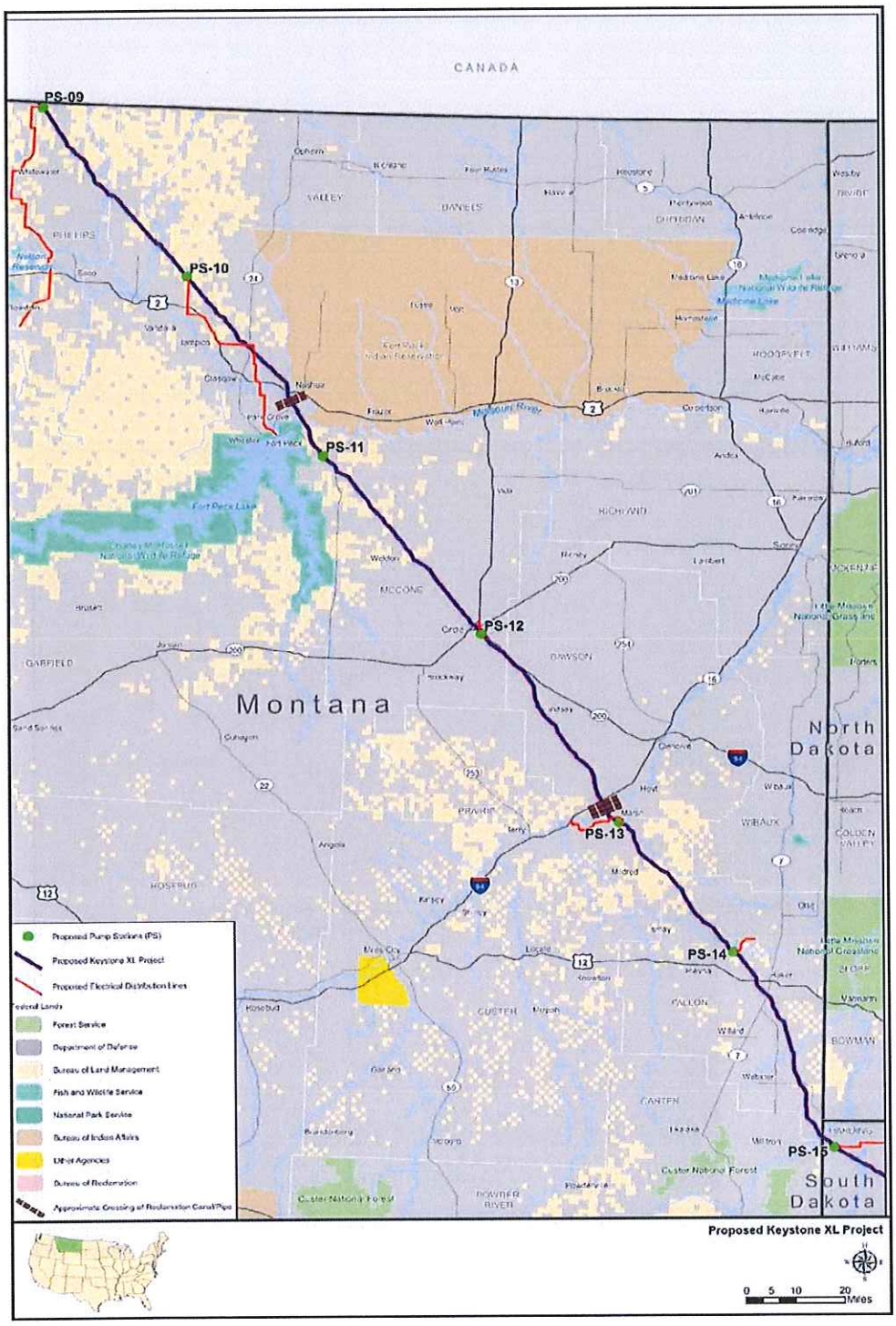

Figure 2. Montana segment of the Keystone Pipeline Project

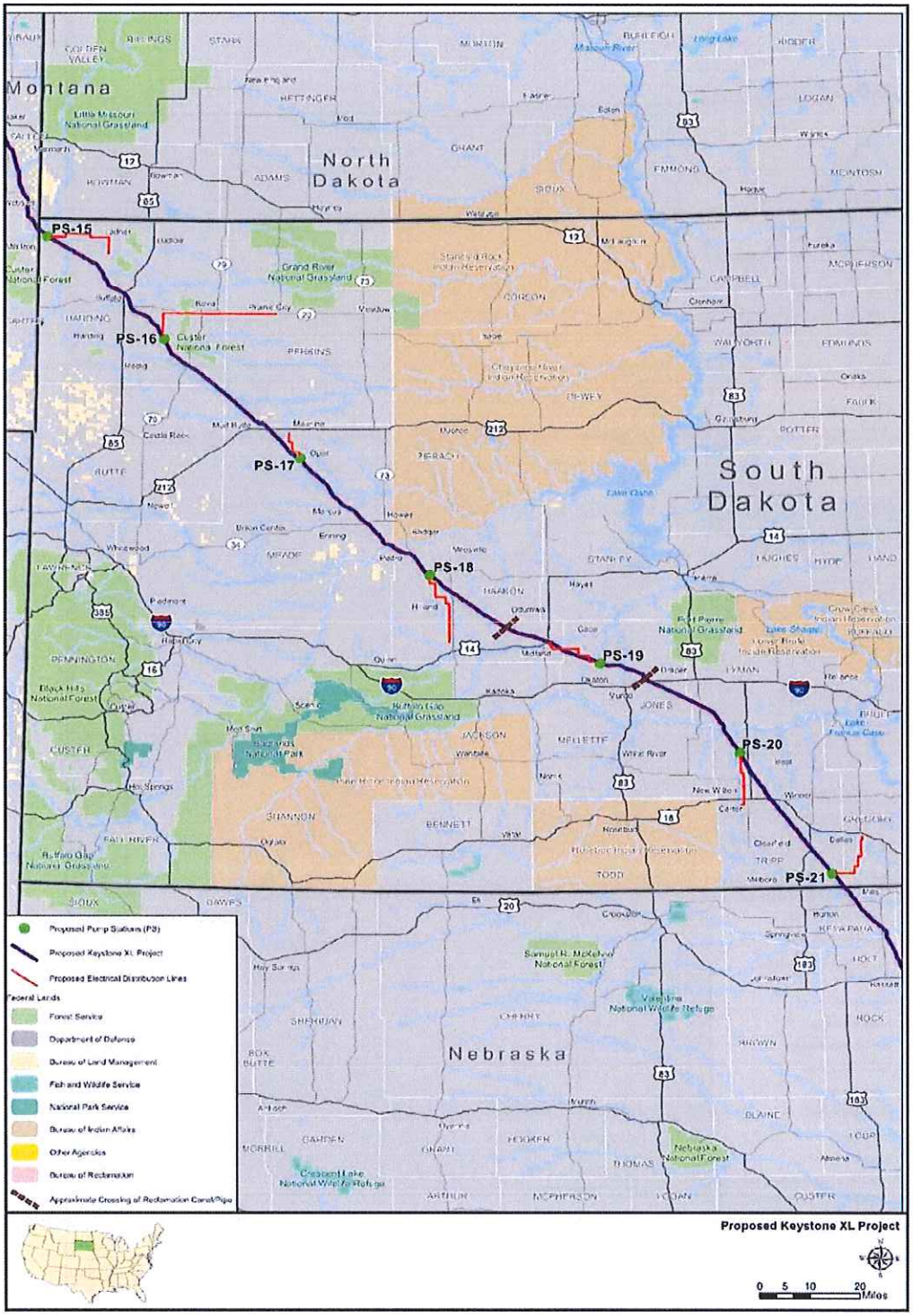

Figure 3. South Dakota segment of the Keystone Pipeline Project

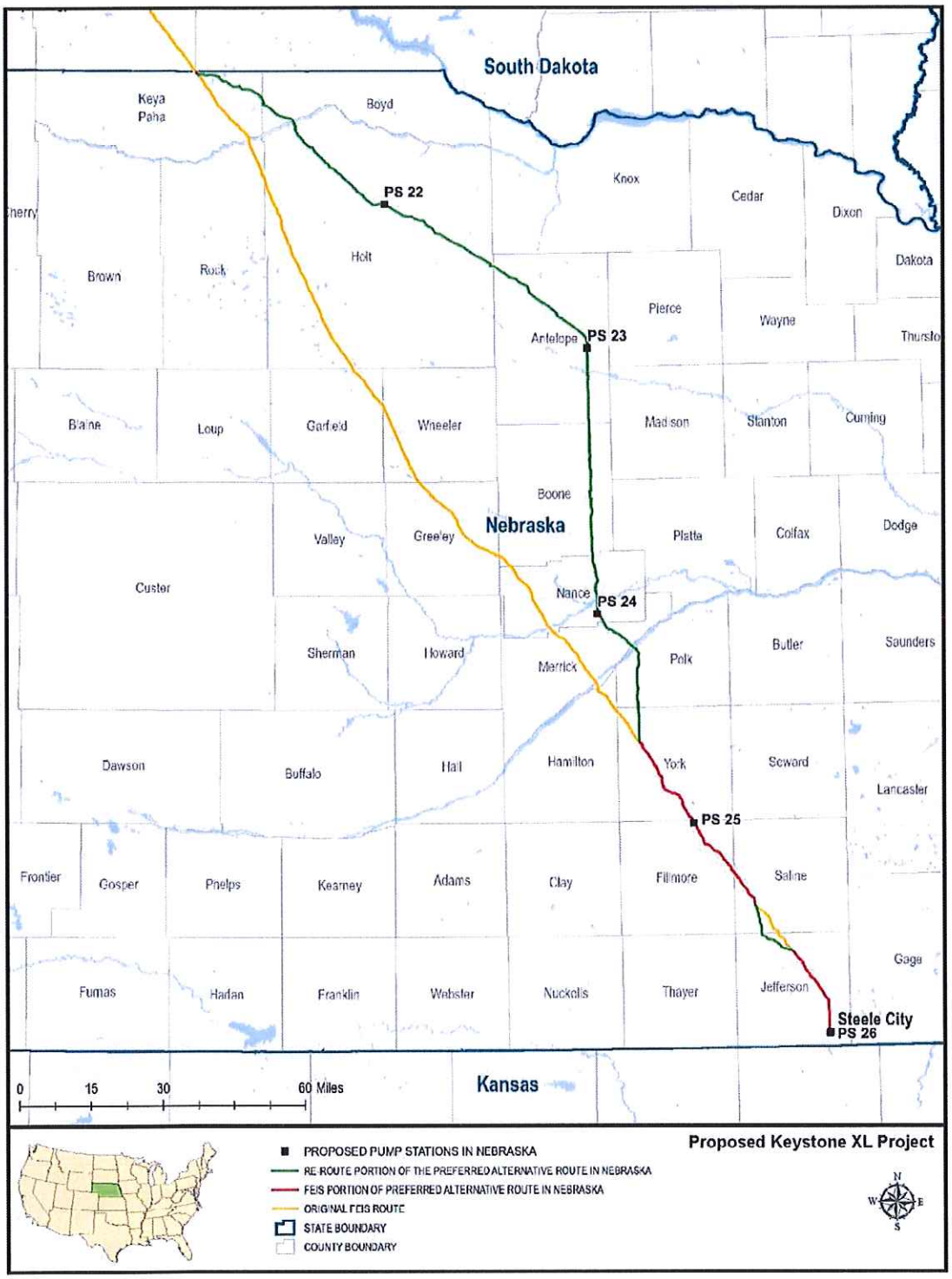

Figure 4. Nebraska segment of the Keystone Pipeline Project

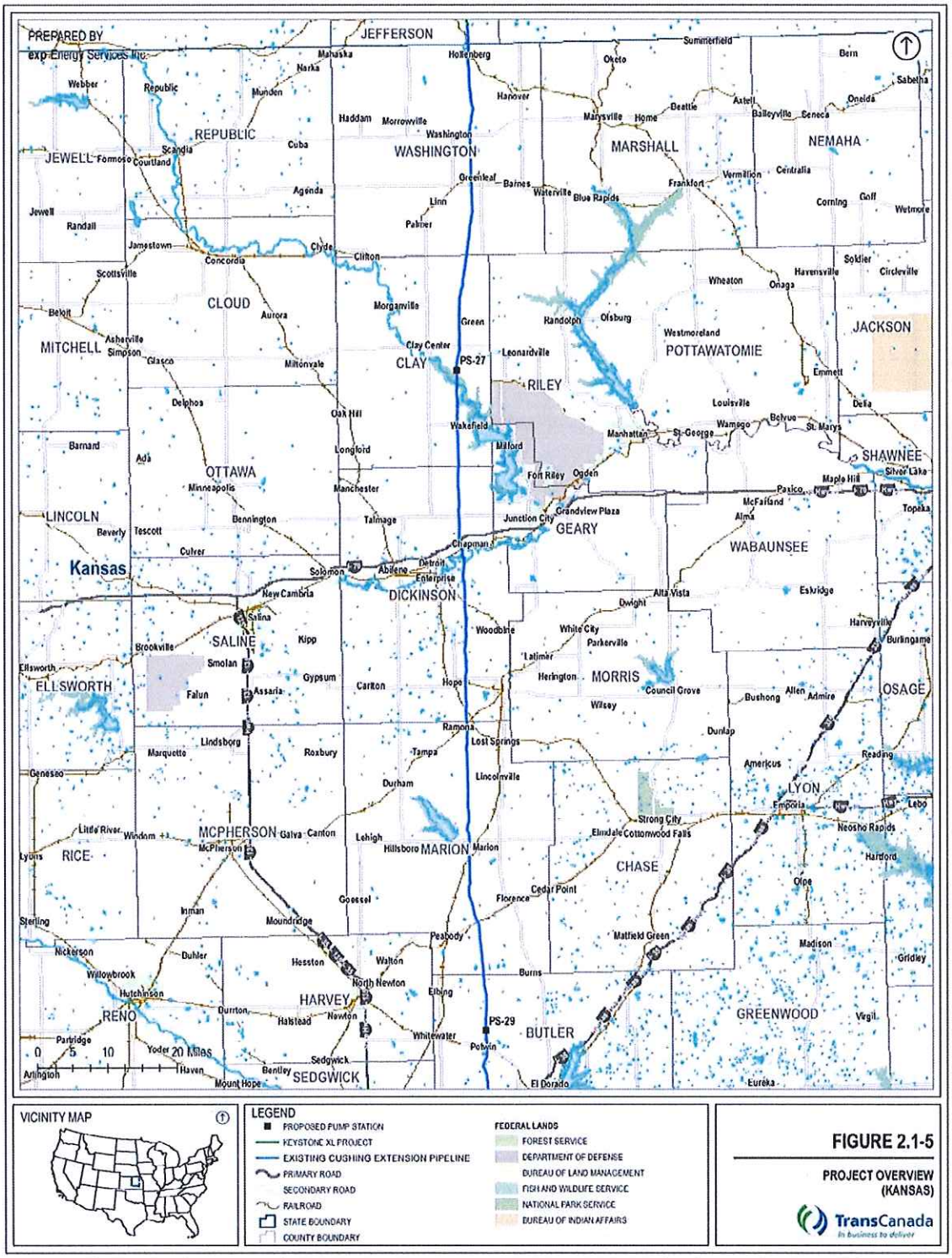

Figure 5. Kansas segment of the Keystone Pipeline Project

Appendix B

American Burying Beetle

Trapping Protocol

Conservation Measures

Qualification Criteria

Nebraska

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Trapping Protocol

December 2008

Trapping methods are used for both Presence/Absence surveys and Capture and Relocation. Trapping for the American burying beetle (*Nicrorphorus americanus*) (ABB) will be conducted with a modified version of the U.S. Fish and Wildlife Service's (1991) protocol, as described by Bedick et al. (2004). Trapping for the ABB may be conducted during two periods in the year in Nebraska.

The first period in early summer (approximately June 7to July 1) is after beetles have emerged from hibernation and prior to beetles going underground during the larvae rearing cycle. The second trapping period is in late summer (approximately August 7th to September 1st), after the larval cycle when both senescent and teneral beetles are present. For the early summer period, trapping will be conducted when the average temperature at midnight is 60 degrees Fahrenheit or greater. It is recommended that trapping be conducted when the average temperature at midnight is 60 degrees Fahrenheit or greater. Trapping of ABB may be conducted during this period when the average temperature at midnight is 55 degrees Fahrenheit or greater, however, false negative presence data may be obtained under these conditions.

A positive control should be used in association with trapping. A positive control establishes that conditions were correct in a given geographic area and that ABB were active during the timeframe of the trapping. Only one ABB capture is necessary to establish a positive control. The positive control window may be up to seven days prior to trapping, or during, but not after the trapping timeframe. There are several locations within Nebraska with a recent history of dense populations and that have been documented through regular research.

Coordination with the U.S. Fish and Wildlife Service (USFWS) and Nebraska Game and Parks Commission (NGPC) may provide existing projects with positive controls. When trapping south of the Platte River, Lincoln County may be used and for trapping north of the Platte River, an area near the town of Chambers can be used.

Adult ABBs will be captured by use of baited pitfall traps consisting of a five-gallon (18.92 Liter) plastic bucket (diameter 28.5cm). Bedick (1997) found a five-gallon bucket to be the most appropriate pitfall trap when sampling for the ABB because they provide a larger surface area for each beetle to escape from other carrion beetles. Alternatively, a one-gallon bucket may be used as a pitfall trap in those instances where burial of the five-gallon bucket would be difficult.

All buckets will be washed using bleach and thoroughly rinsed prior to being used as traps. All buckets will be buried in the ground, with approximately 4-5 cm of the bucket above ground

level. Soil will then be built-up around the bucket, creating a gradient from ground level upwards to the bucket rim. This will be done to limit the amount of water entering the buckets through runoff and splashing of water during rainfall events. Buckets will be located on elevated terrain so as to prevent inundation during rainfall events as beetles can drown very easily in even a small amount of water. Traps should not be placed within 10 feet of ant colonies, as they can kill the beetles that have been captured. Approximately 5-8 cm of moist soil will be placed in the bottom of the bucket to give trapped carrion beetles room to burrow into the soil to avoid competitors, high temperatures, and low moisture levels above the soil. To prevent rainfall and debris from directly entering the bucket, a square piece of plywood (37 cm by 37 cm) will be placed on top of the trap, supported by two or more sticks/narrow boards ranging from 1.5-2.5 cm in thickness. Additional weight (e.g. soil plug, rocks, etc.) will then be placed on top of the trap cover to reduce bait loss to vertebrate scavengers and to prevent the cover from being moved by wind or small animals.

It is recommended that all traps be baited with previously-frozen, 275-374 g laboratory rats (*Rattus norvegicus* – available from online dealers such as RodentPro.com). If rats are not available, bait items of comparable size and structure may be used. The bait will be aged in airtight containers for 3 to 7 days, depending on the temperature and other weather conditions. In contrast to the previous protocol, the bait will not be placed into containers within the traps. What is critical is that the bait is ripe and emits a powerful odor as beetles key in on odor to locate food. With larger numbers of traps spread across a relatively large area, it is better to allow carrion beetles to feed on the bait, which also helps maintain moisture levels in the soil within the trap and reduces stress. This will also prevent loss of beetles to inter-beetle predation and desiccation, which has been determined to be a potential mortality factor for Silphidae on hot mornings by Bedick (1997). Traps will be spaced no farther than 1 mile (1.6 km) apart to ensure that the entire survey area will be covered by the predicted radius of the trap (0.5-mile (800 m)). Traps will be set on the first trap day before 1800 hours and checked every subsequent morning by 1100 hours.

Trapping will be conducted for a minimum of five consecutive days. When trapping for ABB, if weather conditions are unsuitable for trapping during the 5 consecutive days, it is not necessary to begin the 5-day session again, but rather add one night of trapping for each night of unsuitable conditions. Unsuitable weather conditions include nights when the temperature drops below 55°F or if it is raining. It is assumed that on nights with unsuitable conditions, beetles will not be active.

At each trap site, a GPS location and digital photograph will be taken to document the location of the trap and the general habitat characteristics there. All carrion beetles captured will be identified to species whenever there is available time and resources, and the ABB will be sexed by use of Ratcliffe (1996). If the goals and objectives of the survey effort are to assess

population status and requires marking beetles, all ABB captured will be recorded and marked using a drop of model paint (such as Testors) placed on the pronotum or the posterior portion of one or both elytra. Paint will be applied in a manner that will not cause damage to the elytra. If the purpose of the trapping effort is to clear an area, marking beetles is not necessary.

All ABB captured during the second trapping period (August 7th through September 1) will be evaluated for being either teneral or senescent, if the surveyor(s) have been properly trained. Captured ABB will be released as quickly as possible. For research purposes, the ABB may be released at the point of capture or at locations away from the capture point if such release methods are identified in an approved research design and the release sites have been evaluated as providing suitable habitat for the beetle. For the purpose of clearing a site of ABB prior to disturbance activities, captured beetles will be released in suitable habitat at a minimum distance of two miles away from the capture site. The release sites should be included in proposed conservation measures by the project proponent for concurrence on the project. All captures of ABB will be recorded in the format of the Natural Heritage's Database housed by the NGPC, including recording captures in a Geographic Information System Database, as applicable, for future reference and analysis. Results of surveys will be sent to the NGPC and USFWS in accordance with applicable federal and state permit requirements.

References

Bedick, J. C., B. C. Ratcliffe and L. G. Higley. 2004. A new sampling protocol for the endangered American burying beetle, *Nicrophorus americanus* Oliver (Coleoptera: Silphidae). The Coleopterists Bulletin. 58(1): 57-70.

Ratcliffe B. 1996. The carrion beetles (Coleoptera: Silphidae) of Nebraska. Bulletin of the University of Nebraska State Museum 13:1-100.

U.S. Fish and Wildlife Service. 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.

Conservation Measures

Background

The federal and state endangered American burying beetle (ABB) is the largest member of the carrion beetle family and has a lifespan of about one year. It ranges from 1 to 1.5 inches in length, has four red-orange spots on its wing covers, and is distinguished by its larger size and its orange-red pronotum. The ABB was common over the eastern half of North America as recently as the 1920's, but has disappeared over 90 percent of their historic range (Sikes and Raithel 2002). The ABB's current range now includes Rhode Island, Oklahoma, Arkansas, and Nebraska. Reasons for its decline are not well understood but habitat loss and degradation, human activity, light pollution, and pesticides are all considered contributing factors (Sikes and Raithel 2002). In Nebraska, historical records of ABB have been observed in Antelope, Custer, and Lancaster counties. Other counties that have suitable habitat include: Antelope, Blaine, Boone, Boyd, Brown, Cherry, Custer, Dawson, Frontier, Garfield, Gosper, Grant, Holt, Hooker, Keya Paha, Lincoln, Logan, Loup, Rock, Thomas, Valley, and Wheeler.

The ABB has been captured in a variety of habitats including grasslands, grazed pasture, bottomland forest, riparian zones, and oak-hickory forests (Creighton et al. 1993; Lomolino and Creighton 1996; NatureServe Explorer 2007; and U.S. Fish and Wildlife Service 1991) and have been labeled a vegetation generalist (Lomolino et al. 1995). In Nebraska, ABB have been found in mesic areas such as wet meadows and wetlands in association with relatively undisturbed semi-arid, sandhill and loam grasslands. Such areas have been observed to have a thick stand of grassland vegetation with some woody vegetation. The ABB are also found in the Loess Canyons, primarily located in Lincoln County. These steep loess hills and canyons support mixed-grass prairie, but much of the area is heavily invaded by eastern red cedars (Schneider et al. 2005).

It is suspected that carrion availability in a given area is more indicative of ABB presence than vegetation structure since carrion is the sole food source for ABB and is an essential component in a complex reproductive cycle for the species (U.S. Fish and Wildlife Service 1991). The ABB is able to efficiently locate carrion (Bedick et al. 1999) and can move over two miles to a carrion source (Creighton and Schnell 1998). Because of their habit of feeding on carrion, their sole food source, the species may be found in marginal habitat like roadsides where they likely forage on roadkill.

For the ABB to use the carrion for reproductive purposes, the carrion must also be the approximate size of a squirrel and also be located in an area where soil conditions are conducive to excavation by ABBs (Anderson 1982, Lomolino and Creighton 1996). When the ABB locates a suitable carcass, a mated pair will bury the carcass for egg deposition and brood rearing. The larvae feed on the carcass and remain underground through the pupal stage and the parents care

for the developing young underground. The development process from egg to adult takes approximately 48 – 65 days (Ratcliffe and Spomer 2002). Adults and newly-hatched adults (tenerals) will emerge from the ground to feed in preparation for winter hibernation. Current research suggests that the adults return to the ground to overwinter. In Nebraska, ABB have been found in association with soils composed of some clay with a prominent duff (litter) layer have also been observed.

Adult ABB are fully nocturnal and are typically active when night time temperatures reach 60° F. Thus, the ABB active period in Nebraska can be as long as April 1 to October 29, with peak periods of activity in June and August. The first peak active period in early summer (approximately June 7to July 1) is after beetles have emerged from hibernation and prior to beetles going underground during the larvae rearing cycle. The second peak active period is in late summer (approximately August 7 to September 1), after the larval cycle when both senescent and teneral beetles are present. The ABB enter an inactive period spent underground throughout the winter when the nighttime low temperatures are consistently 60° F or below. In Nebraska, this typically occurs from October 29 to April 1.

Purpose

Surveys for ABB are designed to ensure awareness and resolution to any potential conflicts between ABB and potentially disruptive human activities. To prevent conflict, two types of actions are recommended, depending on the location: **Presence/Absence Surveys and Capture/Relocation Conservation Measures**. In addition, **Maintaining Clear Activities** may be necessary depending on the situation. One factor when deciding which actions are necessary is the ABB Distribution Map (Attached). In areas of counties with ABB, first a Presence/Absence Survey should be conducted to determine if relocation is necessary. Habitat for ABB should assume presence and Capture and Relocation conservation measures should be implemented, followed by Maintaining Clear Activities.

These measures/surveys and activities are to occur in areas of suitable habitat in construction areas. Construction areas include areas that will be impacted by construction, where heavy equipment and materials will be staged and/or stored, all areas within the Limits of Construction, potential haul or temporary roads and borrow site areas. Areas of unsuitable habitat are defined below. Since this species is found in a variety of habitats, the NGPC and USFWS encourage the project proponent to discuss additional unsuitable habitat or potential habitat if the project proponent desires further guidance in determining where conservation activities are necessary.

If the project proponent chooses to conduct a survey, the Nebraska ABB Survey Protocol is recommended (See Attached). A valid section 10 permit from the USFWS and Scientific and Education Permit from the NGPC are required for anyone conducting such surveys. All survey

results, positive or negative, must be submitted in writing to these Agency offices for review prior to initiating any ground disturbing activities.

Presence Absence Survey (PA)

An initial screening of the project may reduce the area where the PA survey is necessary. Urban areas dominated by pavement, areas dominated by row crop agriculture, and areas consistently inundated with water need not be surveyed for presence or absence. Wet meadows, often associated with wetlands and riparian areas are ideal habitat and cannot be eliminated. Open grassland areas with scattered cottonwood trees also represent potential habitat. If the project proponent chooses to reduce the PA survey area based on these habitat criteria, a revised area where the PA survey will be conducted should be submitted to the USFWS and the NGPC to ensure areas of potential habitat are not inadvertently omitted.

The PA Survey needs to be conducted when the ABB is active. Research suggests that when the average temperature at midnight is 60 degrees Fahrenheit or greater, detection results are the most consistent. The PA Survey for ABB may be conducted during this period when the average temperature at midnight is 55 degrees Fahrenheit or greater, however, false negative presence data may be obtained under these conditions. Each situation is unique and the project proponent will need to determine, based on local conditions if surveys are valid or if a repeat PA Survey is necessary. The USFWS and NGPC welcome questions as they arise during a survey. A photograph should be taken of each trap site and sent to the NGPC.

The Presence Absence Survey needs to be conducted for a minimum of 5 consecutive trap nights. If no beetles are captured during those 5 nights, the ABB is considered absent and the area is considered "clear." This information needs to be sent to the USFWS NGPC. If the project has concurrence from these agencies, then n*o further conservation measures are necessary and construction may begin.* If a beetle is caught anytime during those 5 days, this is considered a positive survey and the P/A may cease. Depending on the project, if capture and relocation measures are recommended, they may begin immediately if conditions are adequate. If capture and relocation measures will not follow the P/A survey, any ABB captured during the PA Survey should be released on site. Notify the USFWS and NGPC of any change of trapping type. Survey results must be submitted to both the NGPC and USFWS. A photo should be taken of the first ABB captured to serve as a voucher specimen.

Capture and Relocation (CR) Conservation Measure

An initial screening of the project may reduce the area where the CR Conservation measure is necessary. Urban areas dominated by pavement, areas dominated by row crop agriculture, and areas consistently inundated with water need not have an attempt to remove ABB because the species would not be present there. Wet meadows, often associated with wetlands and riparian

areas are ideal habitat and cannot be eliminated. Open grassland areas with scattered cottonwood trees also represent potential habitat. If the project proponent decides to reduce the CR area based on these habitat criteria, a revised area where the CR Conservation measures will be conducted should be submitted to the USFWS and NGPC to ensure areas of potential habitat are not inadvertently omitted.

The CR Conservation Measures needs to be conducted when the ABB is active. Research suggests that when the average temperature at midnight is 60 degrees Fahrenheit or greater, detection and capture results are the most consistent. The CR Conservation Measure for ABB may be conducted during this period when the average temperature at midnight is 55 degrees Fahrenheit or greater, however, false negative presence data may be obtained under these conditions. Each situation is unique and the project proponent will need to determine, based on local conditions if surveys are valid or if a repeat is necessary. The USFWS and NGPC welcome questions as they arise during a survey or trapping series. A photograph should be taken of each trap site and sent to the NGPC.

When trapping for ABB, if weather conditions are unsuitable for trapping during the 5 consecutive days, it is not necessary begin the session again, but rather add one night to the end of the session. Unsuitable weather conditions include nights when the temperature drops below 55°F or it is raining.

Trapping for relocation must be conducted for a minimum of 5 consecutive nights. For an area to be "cleared" the last three consecutive nights must have no ABB. Any captured ABB must be moved to suitable habitat areas located at least 2 miles from the area of construction. Photo documentation of the release sites should be taken and submitted to the USFWS and NGPC. Upon completion of the capture and relocation measures, if the project is within the known ABB distribution, *Maintaining Clear Activities must be implemented within 3 days of establishing "clear," regardless of the presence or absence of ABB.* If the project is not in the current distribution area of the map and no ABB were detected, no further conservation actions are necessary for that calendar year. Results of the survey must be submitted to both the NGPC and USFWS. A photo should be taken of the first ABB captured to serve as a voucher specimen.

If a site cannot be cleared by the capture and relocation procedure after 10 days of trapping, contact the USFWS and NGPC for additional guidance. This situation is considered unlikely, and will need to be dealt with on a case by case basis. Additionally, no more than 50 ABB should be moved to each re-location site.

If the project will impact suitable ABB habitat or impact areas of known ABB occurrences for multiple years, a new survey, the capture/relocation procedure and the standard conservation measures may be necessary for each year of construction. Surveys results are typically only

valid for one season. The sequence of construction will determine what measures are necessary. In this situation, it is recommended that the details and necessary measures be determined through the information consultation process between the NGPC and USFWS.

Maintaining Clear Activities

The purpose of Maintaining Clear (MC) Activities is to ensure that once an area is "cleared" that ABB are not attracted to the site during construction. MC Activities are necessary when the ABB is active, so depending on the disturbance timeframe, the maximum time they may be necessary is from April 1 through September 15. Upon completion of Capture and Relocation Conservation Measures, Maintaining Clear Activities must be implemented within 3 days. However, these activities may be implemented prior to survey or capture/relocation completion. These activities are designed to deter ABB from utilizing the site, so it may be in the project proponent's best interest to begin these activities as early as April 1. If only these activities are being implemented (if the clearing activities occurred the previous fall), then these activities should begin by April 15th if the construction will occur after that time. If construction will occur on or before April 15th, then these MC Activities should begin 2 weeks prior to April 15th.

The project proponent will prepare the area by removing any and all carcasses prior to construction. Carcasses as small as songbirds are ideal food for ABB, so this removal activity must be thorough. Carcass removal must continue until September 15 or until construction is completed, whichever is earlier. Carcass removal can be done at any time throughout the day, but the preferred timing is late afternoon. This will ensure that the nocturnal ABB is not drawn to the area by road kill caused by daytime traffic. Disposal of carcasses should be at least 0.5 miles from the project site.

In addition, the area of construction should be mowed such that the vegetation is as low as possible without causing erosion. This short vegetation height shall be maintained by the project proponent for the duration of the project. Along with mowing, the residual vegetation from mowing needs to be removed from the area. Possible methods are raking, windrowing or bailing. Alternatively, mowing can be done approximately every 2 weeks and the vegetation kept less than 8 inches tall. No vegetation removal is necessary if this height is maintained. All construction, work vehicles and personal vehicles should be staged in mowed areas.

Photo documentation of these MC activities is in the best interest of the project proponent. The USFWS and NGPC request that photographs of mowing and carrion that is removed be included in weekly reports to the Environmental Analyst (NGPC) and Fish and Wildlife Biologist (Service).

Unusual Circumstances

This protocol was developed as a standard for most projects that may disturb ABB habitat, but unique situations may require an individualized approach. If the project proponent has an

alternative to the suggested conservation actions described in this protocol, the USFWS and NGPC will discuss potential alternative methods for avoiding take of ABB.

Night Work and Light Pollution Concerns

Artificial light sources have been implicated in causing insect population losses (Pyle *et al* 1981). The ABB's attraction to artificial lighting could cause it to fly from suitable habitat resulting in excessive energy expenditure and reduced reproductive success as well as make it vulnerable to nocturnal predators such as other insects and bats. The USFWS and NGPC are aware that the ABB is attracted to ultraviolet light since several individuals have been trapped on other project areas using black light traps. In addition, forms of insect control used at residential areas, which involve the use of black lights as an attractant and a lethal electric grid have been known to kill ABBs.

To avoid attracting the ABB from nearby habitats to the proposed project site, it is recommended that the following conservation measures be implemented for permanent structures:

- No light traps should be used as a means of insect control.
- All exterior lighting sources should be low pressure sodium vapor lights;
- All exterior lighting should have downward shields installed to direct light to the ground and not illuminate the project area;
- All exterior lighting should be low mast to minimize light dispersion thereby reducing the attraction to the ABB;
- Where possible, a vegetative screen consisting of native trees and shrubs should be established between the proposed permanent facilities and nearby habitats that may harbor the ABB; and
- In areas of known ABB populations or where ABB have been positively identified night work may need to be restricted during the ABB active seasons due to potential impacts to the species.

The appropriate course of action involving all or a subset of the above bulleted items would need to be determined on a case by case situation.

References

Anderson R. S. 1982. On the decreasing abundance of *Nicrophorus americanus* Oliver (Coleoptera: Silphidae) in eastern North America. The Coleopterists Bulletin 36: 362-365.

Bedick J. C., B. C. Ratclife, 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.

Creighton, J. C. and G. D. Schnell. 1998. Short-term movement patterns of the endangered American burying beetle *Nicrophorus americanus*. Biological Conservation. V 86 (3) 281-287.

Creighton, J. C., C. C. Vaughn, B. R. Chapman. 1993. Habitat preference of the endangered American burying beetle (*Nicrophorus americanus*) in Oklahoma. The Southwestern Naturalist 38: 275-277.

Lomolino M.V., J. C. Creighton, G. D. Schnell and D. L. Certain. 1995. Ecology and conservation of the endangered American burying beetle (*Nicrophorus americanus*). Conservation Biology 9: 605-614.

Lomolino M.V. and J. C. Creighton. 1996. Habitat selection, breeding success and conservation of the endangered American burying beetle *Nicrophorus americanus*. Biological Conservation 77: 235-241.

NatureServe Explorer: An online encyclopedia of life [web application]. 2007. Arlington, Virginia, USA: NatureServe. Available: http://www.natureserve.org/explorer.

Nebraska Game and Parks Commission. 1995. Nebraska's Threatened and Endangered Species: American Burying Beetle. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Pyle, R., M. Bentzien, and P. Opler. 1981. Insect conservation. *Annual Review of Entomology* 26:233-258.

Ratcliffe, B. C. and S. Spomer. 2002. Nebraska's Endangered Species Part 1: Introduction and the Insects. Museum Notes. Number 113. University of Nebraska State Museum, Lincoln, Nebraska.

Schneider, R., M. Humpert, K. Stoner, G. Steinauer. 2005. The Nebraska Natural Legacy Project – A Comprehensive Wildlife Conservation Strategy. Nebraska Game and Parks Commission, Lincoln, Nebraska.

Sikes, D. S. and C. J. Raithel. 2002. A review of hypotheses of decline of the endangered American burying beetle (Silphidae: *Nicrophorus americanus* Oliver). Journal of Insect Conservation 6: 103-113.

U.S. Fish and Wildlife Service. 1991. American Burying Beetle (*Nicrophorus americanus*) Recovery Plan. Newton Corner, Massachusetts. 80 pp.

American Burying Beetle

Qualification Criteria
April 2012

It is important that individuals conducting research on the American burying beetle (ABB) meet the following qualifications for handling and surveying for the species. Survey work done incorrectly can cause unnecessary injury and/or mortality to the ABB. All potential Permit holders must have at least a bachelor's degree in wildlife management, entomology, biology, wildlife ecology, or similar field; or have worked in one of these fields for at least 10 years. All individuals range wide must operate under a Section 10(a)1(A) recovery permit, have undergone training, and have met the following qualifications prior to conducting surveys for the species.

Qualifications

a) Provide citations for ABB literature reviewed to gain knowledge about the species before training begins.

b) Familiarity with local and national survey protocols.

c) Familiarity with ABB conservation measures.

d) Training in the ability to identify suitable ABB habitat.

e) Identification of ABB including sex, age (teneral/senescent), size, and other Nicrophorus species occurring in the state for which the applicant will be permitted.

f) Trap preparation, bait selection and preparation, trap site selection, and trap installation.

g) Under the supervision of a qualified surveyor, complete a whole field trapping sequence/cycle in which an ABB is captured. The cycle is to include trap installation, trap checking, burying beetle identification, bait checking and replacement, ABB handling, and release, relocation, trap removal, and site reclamation.

h) Survey reporting and completion of all required forms, whether federal and/or state.

i) Familiarity with a section 10 recovery permit, including special conditions for the ABB and annual reporting requirements.

Applications for a section 10 recovery permit will include the application for the permit, a curriculum vitae or resume, and signed documentation from the trainer attesting to the completion of all qualification requirements.

Appendix C

Monitoring Program

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Compliance Monitoring Program for the American Burying Beetle

Keystone XL Pipeline

The U.S. Department of State (DOS) will retain a third-party contractor to develop and implement an American burying beetle (ABB) monitoring program or ABB monitoring would be included as a possible wider project level monitoring program for the proposed Project to assure that the provisions of the USFWS's Keystone XL Pipeline Biological Opinion under section 7 of the Endangered Species Act (ESA) (16 U.S.C. § 1536(a) (2)) are met through monitoring and habitat reclamation activities. This monitoring program would be approved and overseen by DOS in consultation with USFWS. TransCanada Keystone Pipeline, LP (Keystone) would fund the monitoring program prior to construction of the proposed Keystone XL pipeline (Project) in the states of South Dakota and Nebraska.

Monitoring will not replace the environmental quality control plan or the actions that Keystone would put in place, but is in addition to those tasks and will serve as a quality control monitor on behalf of DOS. The monitoring program would include, but is not limited to, a combination of site visits and aerial surveillance to provide a reasonable level of confidence that avoidance, minimization, and mitigation measures are being followed during construction of the Project. Monitoring would include, but is not limited to, implementation of conservation measures and reasonable and prudent measures and associated term and conditions as identified in the BO, including ensuring that construction impacts match permitted footprint, and habitat restoration for the ABB. Monitoring will not include surveys for the ABB that are recommended to be conducted to monitor incidental take expected during the course of Project construction.

This monitoring program will identify the number of acres disturbed by the Project in the states of South Dakota and Nebraska, and the number of acres restored as described in Appendix D.

The third party contractor will monitor the project for four (4) years commencing on the date of construction of the proposed Project in the states of South Dakota and Nebraska. With concurrence of the DOS and the USFWS, the monitoring program may be continued for another four (4) years in the event of failure of habitat reclamation or delays in construction of the Project and/or reclamation activities.

The third-party contractor would undertake the following:

1. By October 1 of each year submit an annual monitoring plan for the following fiscal year in a letter to the DOS. This plan would include the anticipated work effort and schedule, subject to the variability of weather, construction season, etc.

2. Maintain monitoring logs, photographs, and documents and provide DOS a summarized monthly report during construction and a biannual report in the years after construction. At the end of this Agreement, all original files and documents will be provided to DOS with copies retained by USFWS.

3. Contact the DOS designated point of contact when listed conservation measures and Reasonable and Prudent Measures and Terms and Conditions set forth in the USFWS's Biological Opinion are not being met and work with DOS to remedy the situation(s).

4. Be available to DOS for meetings or phone calls concerning the proposed Project, as the agencies deem appropriate.

5. Have designated inspector(s) attend safety training or meet other requirements Keystone may have for inspector(s) to access construction job sites.

6. Recognize and support that DOS, in consultation with USFWS, will have final determination of appropriate remedies for any failures by Keystone to comply with the requirements of the USFWS Biological Opinion, exclusive of the Migratory Bird Treaty Act.

Appendix D

American Burying Beetle

Habitat Conservation Trust

AGREEMENT

Habitat Conservation Trust
American Burying Beetle Habitat
Keystone XL Pipeline
U.S. Fish and Wildlife Service, U.S. Department of State, TransCanada Keystone Pipeline, LP

PURPOSE

This Agreement (Agreement) is entered into by and between the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of State (DOS), and TransCanada Keystone Pipeline, LP (Keystone). The purpose of this Agreement is to establish responsibilities of the three parties for compensatory mitigation to offset temporary and permanent loss of habitat for the federally endangered American burying beetle (ABB) resulting from construction and operation of the proposed Keystone XL Project pipeline (Project) in the states of South Dakota and Nebraska consistent with the USFWS Biological Opinion, dated May 15, 2013.

Keystone agrees to provide compensation for temporary and permanent ABB habitat loss due to Keystone XL pipeline construction and operations in areas where the species is likely to be impacted including: south of Highway 18 in Tripp County in South Dakota and Keya Paha and Holt counties (north and west of Highway 281 or the City of O'Neil) in Nebraska (Attachment A).

Compensation is based on total acres impacted and has been modified by habitat quality rating multipliers with prime habitat compensation at 3 times the total impact acres, good habitat at 2 times the total impact acres, fair habitat at 1 times the total impact acres, and marginal habitat at 0.5 times the total impact acres. Rating multipliers were developed based on the temporal loss of habitat. Higher quality, prime habitat would reasonably be expected to be more important to ABB than marginal habitat and thus, its loss is reflective by applying a larger habitat multiplier. No compensation is required for poor habitat. Temporary habitat impacts are scaled for the period of time anticipated for recovery of vegetation cover at 4 years over the 50 year life of the Project or 8% of total calculated impacts. All compensation is based on habitat ratings and the number of acres affected, and is compliant with verbal agreements between DOS, USFWS and Keystone.

The ABB Habitat Conservation Trust (Trust) will be used to acquire lands and easements from willing sellers, and to develop conservation plans and agreements with landowners for protecting and enhancing ABB habitat in Nebraska and South Dakota. Additionally, up to 10 percent of the Trust funds may be used for appropriate research such as research on recolonization of ABB on disturbed sites and other research which would contribute to the recovery of the ABB. Funds will be placed with a nongovernmental organization (NGO) experienced and familiar with managing conservation trust funds or a similar mutually agreeable NGO. Habitat projects and land or easement acquisitions for the benefit of the ABB will be approved for funding by the NGO in coordination with USFWS offices in South Dakota and Nebraska. There will be no time limit on when the funds can be expended, but it is expected that most of the work and opportunities will occur within the first five years after the fund is established. To help ensure a continuous source of funds are available, 10% of the funds will go to a permanent endowment, also managed by the NGO for the long-term benefit

and management of endangered and other at risk species in Nebraska and South Dakota in coordination with the South Dakota and Nebraska USFWS offices and the Nebraska Game and Parks Commission.

PAYMENT TERMS & SCHEDULE

Keystone will establish a conservation trust to be managed by NCF/nongovernmental organization within six months of approval of the Presidential Permit for the proposed Project and prior to Project construction in South Dakota and Nebraska, consistent with funds transfer and accounting documents as may be required by the USFWS as calculated in Attachment A to this Agreement.

Total compensatory mitigation for ABB habitat impacts based on the attached valuation (Attachment A) is summarized in Table 1.

Table 1. Compensatory Mitigation for ABB Habitat Impacts Resulting from Construction and Operation of the proposed Keystone XL Project.

	Temporary ABB Habitat Impacts		Permanent ABB Habitat Impacts		
State	**Acres**	**Value**	**Acres**	**Value**	**Total**
South Dakota	526.28	$181,684.08	102.51	$491,112	$672,796.08
Nebraska	728.28	$232,017.12	140.25	$517,482	$749,499.12
Total	**1,254.56**	**$413,701.20**	**242.76**	**$1,008,594**	**$1,422,295.20**

INDEPENDENT AUTHORITIES

This agreement in no way diminishes the independent authorities or responsibilities of either the DOS or the USFWS.

DESIGNATED POINTS OF CONTACT

For USFWS:
Michael D. George
Project Leader, Nebraska Ecological Services, U.S. Fish & Wildlife Service, Grand Island, NE

For DOS: [reserved]

For Keystone:
Sandra Barnett
Environmental Manager
Keystone Pipeline Project
TransCanada Keystone Pipeline, L.P.

EFFECTIVE DATE

This agreement becomes effective upon approval by signature of USFWS, DOS, and Keystone.

MODIFICATION AND/OR TERMINATION

This Agreement may be modified upon agreement by all of the Parties.

This Agreement may be terminated by either the DOS or the USFWS upon 30 days notification to the other party. If there are any unspent funds from the amount transferred from Keystone to the conservation trust at the time of termination, such funds shall be returned to Keystone within 60 days of the date of termination of the Agreement.

U.S. FISH & WILDLIFE SERVICE

BY:_____DATE_____

TRANSCANADA KEYSTONE PIPELINE, LP

BY:_____DATE_____

U.S. DEPARTMENT OF STATE

BY:_____DATE_____

Attachment A: ABB Habitat Conservation Trust Calculations

Table A1. Conservation measures to ameliorate impacts to ABB habitat resulting from construction and operation of the Keystone XL pipeline in South Dakota. Project spatial data supplied by Keystone were used by DOS to determine acres of habitat affected (DOS 2012).

Permanent Impacts[a]

Habitat Rating	ABB Acres Impacted	Modifier	Weighted Acres	Land Value/Acre ($)	Amount ($)
Prime	75.83	3	227.49	1,800	409,482
Good	21.34	2	42.68	1,800	76,824
Fair	0	1	0	1,800	0
Marginal	5.34	0.5	2.67	1,800	4806
Total	102.51				491,112

Temporary Impacts[b]

Habitat Rating	ABB Acres Impacted	Modifier	Weighted Acres	Land Value/Acre ($)	Conservation Amount ($)
Prime	325.94	3	977.82	1,800	1,760,076
Good	95.80	2	191.60	1,800	344,880
Fair	80.01	1	80.01	1,800	144,018
Marginal	24.53	0.5	12.26	1,800	22,077
Total	526.28				2,271,051

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline.
[b] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.
Note: Miles are the same for both temporary and permanent impacts as both are calculated using the pipe centerline
Note: Temporary habitat impacts are scaled for the period of time anticipated for recovery of vegetation cover at 4 years over the 50 year life of the Project or 8% of total calculated impacts (0.08 x 2,271,051). Thus, the total amount contributed would be $181,684.08.

Table A2. Conservation measures to ameliorate impacts to ABB habitat resulting from construction and operation of the Keystone XL pipeline in Nebraska. Project spatial data supplied by Keystone were used by DOS to determine acres of habitat affected (DOS 2012).

Permanent Impacts[a]

Habitat Rating	ABB Acres Impacted	Modifier	Weighted Acres	Land Value/Acre ($)	Conservation Amount ($)
Prime	61.47	3	184.41	1,800	331,998
Good	42.46	2	84.92	1,800	152,856
Fair	0	1	0	1,800	0
Marginal	36.32	0.5	18.16	1,800	32,482
Total	140.25				517,482

Temporary Impacts[b]

Habitat Rating	ABB Acres Impacted	Modifier	Weighed Acres	Land Value/Acre ($)	Conservation Amount ($)
Prime	365.57	3	1,096.71	1,800	1,974,078
Good	226.59	2	453.18	1,800	815,724
Fair	13.44	1	13.44	1,800	24,192
Marginal	122.68	0.5	61.34	1,800	110,412
Total	728.28				2,900,214

[a] Permanent impacts are caused by the placement of permanent above-ground facilities (i.e., pump stations), and the 22-foot corridor spanning the center of the pipeline ROW affected by heat dissipation from the operating pipeline.
[b] Temporary impacts are caused by temporary construction workspace, and construction of temporary access roads.
Note: Miles are the same for both temporary and permanent impacts as both are calculated using the pipe centerline
Note: Temporary habitat impacts are scaled for the period of time anticipated for recovery of vegetation cover at 4 years over the 50 year life of the Project or 8% of total calculated impacts (0.08 x 2,900,214). Thus, the total amount contributed would be $232,017.12.

Appendix E

Reclamation Performance Bond

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Performance Reclamation Bond

A reclamation performance bond will be established for a period of eight years. The bond will be applied to supplemental vegetation reclamation if restoration for American burying beetle (ABB) habitat failed, as discussed during consultation among the U.S. Department of State (DOS), U.S. Fish and Wildlife Service (USFWS), and Keystone. This performance bond will be accessible and executed by DOS, or a third party at the discretion of the DOS, if and when disturbed land in the ABB habitat area, as defined by the Biological Assessment (BA) (DOS 2012), should fail to revegetate in a manner outlined below, and Keystone fails to take corrective action. Release of the bond will be solely at the discretion of DOS after soliciting recommendations from the USFWS and the Nebraska Game and Parks Commission.

Bond Stipulations

Bond covers cost of supplemental reclamation for failure of land to appropriately revegetate, starting four years after commencement of construction.

Bond coverage is limited to ABB habitat areas as defined in the BA (except for smaller areas within ABB habitat that are unsuitable for beetle occupation, such as crests of windblown hills).

Successful reclamation criteria:

- Reclamation will be measured four years after the commencement of construction.
- For reclamation to be deemed successful, native grasslands restored on the right-of-way (ROW) must be comparable to those on adjacent undisturbed lands.
- 70 percent of the dominant species on the ROW must be the same as those that occur on adjacent off-ROW lands.

Reclamation success will be determined by inspection of the defined areas jointly by Keystone and DOS or its designated agent.

Reclamation will not be deemed successful on private lands where the landowner makes alterations to the seed mix proposed in the project's CMRP and Con/Rec unit.

The value of the bond will be based on an assumed reclamation 10 percent failure rate, using the market cost of seed and an appropriate labor cost totaling $300/acre, and the habitat acreages and multipliers reflected on the attached spreadsheet. On this basis, the initial amount of the bond will be $113,899.62.

At year four, the bond amount will be adjusted to reflect the actual acreage where reclamation has not met the reclamation criteria. Each year after year four, for the duration of the bond period, the bond amount will be readjusted to reflect the remaining acreage that has not met the reclamation criteria.

If Keystone should fail to meet the conditions of these bond stipulations, funds from the bond up to the full amount available, will be released to DOS or its designated agent(s) to complete the reclamation work.

Performance Bond Calculations for ABB habitat reseeding failure

Habitat Quality Rating	SD Acres	NE Acres	Total	Quality Multiplier	Acreage Value
TEMP Prime	325.94	365.57	691.51	3	2,074.53
TEMP Good	95.80	226.59	322.39	2	644.78
TEMP Fair	80.01	13.44	93.45	1	93.45
Total potential ABB acres affected					**3451.54**
10% Failure rate after 4 years (acres)					345.15
10% Failure rate after 8 years (acres)					34.52
Total acres for performance bond					379.67
Total Bond (acres x $300)					113,899.62

Appendix F

Whooping Crane Survey Protocol

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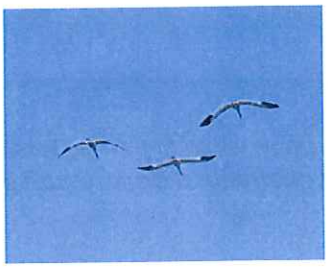
Whooping Crane Fact Sheet



Whooping Cranes in Flight

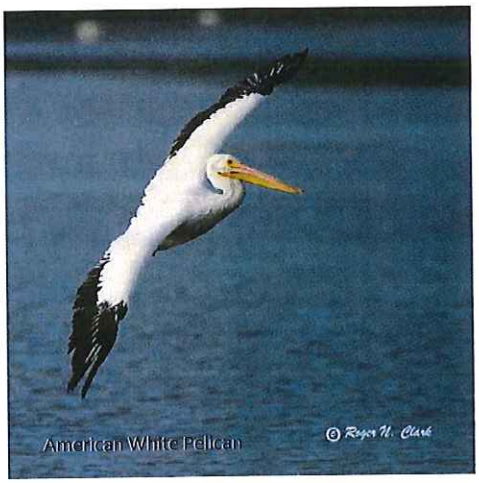
Foraging Whooping Cranes

Adult with juvenile

The Whooping Crane (*Grus americana*) is a federal and state listed endangered migratory species. The Whooping Crane was federally listed as endangered in 1967. Major river systems used by whooping cranes in Nebraska include the Platte, Loup, Republican, 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. (Information from U.S. Fish and Wildlife Service)

Whooping Crane (*Grus americana*)
Order: *Gruiformes*
Family: *Gruidae*
Status: State and Federally Endangered. **Description:** L 52"(132 cm) W 87"(221 cm). Sexes similar but males are larger. White body with red and black facial markings. Yellow bill and long dark legs. Immature is white with tawny head and neck, and reddish-brown mottling on rest of body. **Habitat:** In Nebraska is found along the Platte Valley, with its wide slow moving river and associated sandbars and islands. Nearby wet meadows, croplands, and marshlands are important for foraging. **Status/Range:** Occasional spring and fall migrant along Platte Valley. 90% of sightings within 30 miles of Platte River, and 80% occurred between Lexington and Grand Island. **Call:** Shrill "*ker-loo-ker-lee-loo*" trumpet. **Comments:** Endangered. Management and protection programs slowly succeeding.

Similar: Sandhill Crane, Snow Geese, and especially American White Pelicans in flight: (Information from Nebraska Game and Parks Commission website)



The Whooping Crane is one of the rarest birds in North America and also one of the largest. Whooping cranes are vulnerable to accidents during migration. Each spring they travel north from their wintering grounds around Aransas National Wildlife Refuge in Texas to their breeding grounds in Wood Buffalo National Park in central Canada (2,400 miles). Each fall this route is reversed. Their journey traverses eastern Montana, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma and Texas. In Nebraska, they stop to rest and feed on the Platte, North and Middle Loup and Niobrara Rivers. (Information taken from the USFWS Draft Revised International Whooping Crane Recovery Plan Jan 2005)

Whooping Crane Survey Protocol

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.

Dates of Survey:

- Spring Migration – March 23 – May 10
- Fall Migration – September 16 – November 16
- Surveys should be conducted daily during these two time frames.

Bridge Projects (Roosting Survey)

Time of Survey:

- Prior to sunrise (published clock time) to make use of the beginning daylight hours, record start and stop time
- *Optional* evening survey (after 4:00 pm) to check for birds potentially coming into roost
- Do east side of bridge first to reduce glare from sun.

Method of Survey:

- Stand at the four corners of the bridge – look at all up and down stream channels as far as you can see
- Use binoculars or spotting scope
- Watch for at least 15 minutes overall
  - Look for bird movements – possibly moving within channel among vegetation
  - Look for Whooping Cranes among Sandhill Crane groups
- If cloudy, overcast or foggy and visibility is reduced to below 0.5 miles, allow time for clearing– take additional time to ensure the best survey possible

Linear Projects (Foraging Survey)-not crossing a major river

Time of Survey:

- Survey project within one hour of start of workday, with at least one survey done no later than 10 am. Record start and stop time.
- Survey using binoculars or spotting scope area within 0.5 miles of project.

For projects which are a combination of bridge and linear work use both methods.

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:

- Do not start work. Contact the Commission or the USFWS for further instruction.
- Stop work if seen at times other than the morning survey.
- Work can begin or resume if birds move off; record sighting, bird departure time, and work start time on survey form.

Appendix G

Western Prairie Fringed Orchid

Habitat Conservation Trust

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AGREEMENT

Habitat Conservation Trust
Western Prairie Fringed Orchid Habitat
Keystone XL Pipeline
U.S. Fish and Wildlife Service, U.S. Department of State, TransCanada Keystone Pipeline, LP

PURPOSE

This Agreement (Agreement) is entered into by and between the U.S. Fish and Wildlife Service (USFWS), the U.S. Department of State (DOS), and TransCanada Keystone Pipeline, LP (Keystone). The purpose of this Agreement is to establish responsibilities of the three parties for compensatory mitigation to offset loss of habitat for the federally threatened western prairie fringed orchid (WPFO) resulting from construction and operation of the proposed Keystone XL Project pipeline (Project) in the states of South Dakota and Nebraska consistent with the USFWS's Biological Opinion, dated May 15, 2013.

Keystone agrees to provide compensation for impacts to the western prairie fringed orchid through a Habitat Conservation Trust (Trust) in areas where the species is likely to be found including: southwest of Highway 18 in Tripp County, South Dakota and Keya Paha, Holt, Rock, Antelope, and Boone counties in Nebraska. Compensation will be based on total acres impacted where suitable western prairie fringed orchid habitat is present, regardless of presence/absence survey results. Compensation will be calculated based on total acres impacted (currently unknown) multiplied by 31 percent, the probability of encountering a western prairie fringed orchid in suitable habitat during the course of habitat survey work (NGPC 2013). Habitat surveys will be used to evaluate western prairie fringed orchid habitat. The resultant acreage will be designated as WPFO potentially occupied habitat. A 3:1 habitat mitigation ratio would be applied to the WPFO potentially occupied habitat to offset temporal loss of habitat between the time construction begins and the time orchid habitat is fully restored. The resultant mitigation total acres would be multiplied by the value of an acre of land.

Funds will be placed with a nongovernmental organization (NGO) experienced and familiar with managing conservation trust funds or another mutually agreeable NGO. The Trust will be used by the NGO to acquire lands and easements from willing sellers, and to develop conservation plans and agreements with landowners for protecting and enhancing WPFO habitat in Nebraska and South Dakota. Additionally, up to 10 percent of the Trust funds may be used for appropriate research which would contribute to the recovery of the WPFO. Habitat projects and land or easement acquisitions for the benefit of the WPFO will be approved for funding by the nongovernmental entity in coordination with the South Dakota and Nebraska USFWS offices. There will be no time limit on when the funds can be expended after the fund is established. To help ensure a continuous source of funds are available, 10 percent of the funds will go to a permanent endowment, also managed by the NGO, for the long-term benefit and management of endangered and other at risk species in

coordination with the South Dakota and Nebraska USFWS offices and the Nebraska Game and Parks Commission.

PAYMENT TERMS & SCHEDULE

Keystone will establish a conservation trust to be managed by a NGO within six months of approval of the Presidential Permit for the proposed Project and prior to Project construction in South Dakota and Nebraska, consistent with funds transfer and accounting documents as may be required by the USFWS as calculated in Attachment A to this Agreement.

Total compensatory mitigation for WPFO habitat impacts is based on the attached valuation (Attachment A) and is summarized in Table 1.

Table 1. Compensatory Mitigation for WPFO Habitat Impacts Resulting from Construction of the proposed Keystone XL Project.

Permanent WPFO Habitat Impacts

State	**Acres**	**Value ($)**
		Z3(X(.31))
South Dakota	X	
		Z3(X(.31))
Nebraska	X	
Total		

INDEPENDENT AUTHORITIES

This agreement in no way diminishes the independent authorities or responsibilities of either the DOS or the USFWS.

DESIGNATED POINTS OF CONTACT

For USFWS:
Michael D. George
Project Leader, Nebraska Ecological Services, U.S. Fish & Wildlife Service, Grand Island, NE

For DOS: [reserved]

For Keystone:
Sandra Barnett
Environmental Manager
Keystone Pipeline Project
TransCanada Keystone Pipeline, L.P.

EFFECTIVE DATE

This agreement becomes effective upon approval by signature of USFWS, DOS, and Keystone.

MODIFICATION AND/OR TERMINATION

This Agreement may be modified upon agreement by all of the Parties.

This Agreement may be terminated by either the DOS or the USFWS upon 30 days notification to the other party. If there are any unspent funds from the amount transferred from Keystone to the conservation trust at the time of termination, such funds shall be returned to Keystone within 60 days of the date of termination of the Agreement.

U.S. FISH & WILDLIFE SERVICE

BY:_____DATE_____

TRANSCANADA KEYSTONE PIPELINE, LP

BY:_____DATE_____

U.S. DEPARTMENT OF STATE

BY:_____DATE_____

Attachment A: WPFO Habitat Conservation Trust Calculations

Table A1. Conservation measures to ameliorate impacts to WPFO habitat resulting from construction of the Keystone XL pipeline in South Dakota. Data used to develop this table is from DOS (2012) and based on habitat surveys conducted in summer 2013.

Permanent Impacts (South Dakota)

WPFO Suitable Habitat Acres Impacted	Probability of Encounter	Acres likely Encountered	Modifier	Weighted Acres	Land Value/ Acre ($)	Amount ($)
X	31%	X(.31)	3	3(X(.31))	Z	Z3(X(.31))

Table A2. Conservation measures to ameliorate impacts to WPFO habitat resulting from construction of the Keystone XL pipeline in Nebraska. Data used to develop this table is from DOS (2012) and based on habitat surveys conducted in summer 2013.

Permanent Impacts (Nebraska)

WPFO Suitable Habitat Acres Impacted	Probability of Encounter	Acres likely Encountered	Modifier	Weighted Acres	Land Value/Acre ($)	Amount ($)
X	31%	X(.31)	3	3(X(.31))	Z	Z3(X(.31))