APPENDIX H

2012 Biological Assessment

-This page intentionally left blank-

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

-Page Intentionally Left Blank-

Prepared for:

Keystone XL Project

Keystone XL Project
Final Biological Assessment

-Page Intentionally Left Blank-

Contents

1.1 Section 7 ESA Process 1.0-1
1.2 Consultation History 1.0-1
1.3 Analysis Summary 1.0-6
1.3.1 Connected Actions 1.0-7
1.3.1.1 Bakken Marketlink Project 1.0-7
1.3.1.2 Big Bend to Witten 240-kV Transmission Line 1.0-7
1.3.1.3 Electrical Distribution Lines and Substations 1.0-8
1.4 Summary of Species Considered but Eliminated from Detailed Analysis 1.0-9
1.4.1 Gray Wolf - Endangered/Experimental Populations 1.0-9
1.4.2 Eskimo Curlew - Endangered 1.0-9
1.4.3 Topeka Shiner - Endangered 1.0-9
1.4.4 Blowout Penstemon - Endangered 1.0-10

2.0 Proposed Action 2.0-1
2.1 Proposed Action Background 2.0-1
2.1.1 Project Description and Location 2.0-2
2.1.2 Pipeline Construction Overview 2.0-15
2.1.3 Ancillary Facilities Summary 2.0-15
2.1.4 Land Requirements 2.0-15
2.1.5 Pipeline Right-of-Way 2.0-17
2.1.6 Additional Temporary Workspace Areas 2.0-17
2.1.7 Pipe Stockpile Sites, Railroad Sidings, and Contractor Yards 2.0-18
2.1.8 Construction Camps 2.0-23
2.1.8.1 Camp Design 2.0-27
2.1.8.2 Camp Use 2.0-27
2.1.8.3 Camp Decommissioning 2.0-28
2.1.9 Access Roads 2.0-28
2.1.9.1 Roadway Maintenance, Repair, and Safety 2.0-29
2.1.10 Aboveground Facilities 2.0-30
2.1.10.1 Pump Stations 2.0-31
2.1.10.2 Other Aboveground Facilities 2.0-32
2.1.10.3 Construction Procedures 2.0-32
2.1.10.4 General Pipeline Construction Procedures 2.0-34
2.1.10.5 Survey and Staking 2.0-41
2.1.10.6 Clearing and Grading 2.0-41

2.1.10.7 Trenching 2.0-42
2.1.10.8 Pipe Stringing, Bending, and Welding 2.0-43
2.1.10.9 Lowering In and Backfilling 2.0-43
2.1.10.10 Hydrostatic Testing 2.0-44
2.1.10.11 Pipe Geometry Inspection 2.0-46
2.1.10.12 Final Tie-ins 2.0-46
2.1.10.13 Commissioning 2.0-46
2.1.10.14 Cleanup and Restoration 2.0-46
2.1.10.15 Non-Standard Construction Procedures 2.0-47
2.1.10.16 Aboveground Facility Construction Procedures 2.0-54
2.1.10.17 Construction Workforce and Schedule 2.0-55
2.1.10.18 Decommissioning 2.0-57
2.1.11 Operation and Maintenance 2.0-58
2.1.11.1 Normal Operations and Routine Maintenance 2.0-59
2.1.11.2 Operations 2.0-60
2.2 Cumulative Impacts 2.0-63
2.2.1 Methods and Scope of the Cumulative Impacts Analysis 2.0-64
2.2.2 Past, Present, and Reasonably Foreseeable Projects 2.0-66
2.2.3 Federally Protected and Candidate Species Cumulative Impacts 2.0-75

3.0 Species Evaluation 3.0-1
3.1 Federally Endangered 3.0-1
3.1.1 Black-footed Ferret– Endangered/Experimental Populations 3.0-1
3.1.1.1 Natural History and Habitat Association 3.0-1
3.1.1.2 Potential Presence in Project Area 3.0-2
3.1.1.3 Impact Evaluation 3.0-3
3.1.1.4 Cumulative Impacts 3.0-4
3.1.1.5 Conservation Measures 3.0-4
3.1.1.6 Determination 3.0-5
3.1.2 Interior Least Tern - Endangered 3.0-5
3.1.2.1 Natural History and Habitat Association 3.0-5
3.1.2.2 Potential Presence in Project Area 3.0-6
3.1.2.3 Impact Evaluation 3.0-8
3.1.2.4 Cumulative Impacts 3.0-11

3.1.2.5 Conservation Measures 3.0-11
3.1.2.6 Determination 3.0-12
3.1.3 Whooping Crane - Endangered 3.0-13
3.1.3.1 Natural History and Habitat Association 3.0-13
3.1.3.2 Potential Presence in Project Area 3.0-13
3.1.3.3 Impact Evaluation 3.0-14
3.1.3.4 Conservation Measures 3.0-23
3.1.3.5 Determination 3.0-24
3.1.4 Pallid Sturgeon - Endangered 3.0-25
3.1.4.1 Natural History and Habitat Association 3.0-25
3.1.4.2 Potential Presence in Project Area 3.0-26
3.1.4.3 Impact Evaluation 3.0-26
3.1.4.4 Cumulative Impacts 3.0-30
3.1.4.5 Conservation Measures 3.0-30
3.1.4.6 Determination 3.0-31
3.1.5 American Burying Beetle - Endangered 3.0-31
3.1.5.1 Natural History and Habitat Association 3.0-31
3.1.5.2 Potential Presence in Project Area 3.0-33
3.1.5.3 Impact Evaluation 3.0-56
3.1.5.4 Conservation Measures 3.0-60
3.1.5.5 Determination 3.0-62
3.2 Federally Threatened 3.0-63
3.2.1 Piping Plover - Threatened 3.0-63
3.2.1.1 Natural History and Habitat Association 3.0-63
3.2.1.2 Potential Presence in Project Area 3.0-64
3.2.1.3 Impact Evaluation 3.0-65
3.2.1.4 Cumulative Impacts 3.0-68
3.2.1.5 Conservation Measures 3.0-69
3.2.1.6 Determination 3.0-70
3.2.2 Western Prairie Fringed Orchid - Threatened 3.0-70
3.2.2.1 Natural History and Habitat Association 3.0-70
3.2.2.2 Potential Presence in Project Area 3.0-71
3.2.2.3 Impact Evaluation 3.0-72

3.2.2.4 Cumulative Impacts 3.0-73
3.2.2.5 Conservation Measures 3.0-73
3.2.2.6 Determination 3.0-74
3.3 Federal Candidate Species 3.0-75
3.3.1 Greater Sage-Grouse– Candidate 3.0-75
3.3.1.1 Natural History and Habitat Association 3.0-75
3.3.1.2 Potential Presence in Project Area 3.0-76
3.3.1.3 Impact Evaluation 3.0-77
3.3.1.4 Cumulative Impacts 3.0-79
3.3.1.5 Conservation Measures 3.0-79
3.3.1.6 Determination 3.0-82
3.3.2 Sprague's Pipit - Candidate 3.0-82
3.3.2.1 Natural History and Habitat Association 3.0-82
3.3.2.2 Potential Presence in Project Area 3.0-83
3.3.2.3 Impact Evaluation 3.0-84
3.3.2.4 Conservation Measures 3.0-85
3.3.2.5 Determination 3.0-86

4.0 Background 4.0-1

List of Appendices

Appendix A Letters of Section 7 Consultation Commitments from Power Providers

Appendix B Construction Mitigation and Reclamation Plan (CMRP)

Appendix C PHMSA Conditions for Keystone XL and Keystone Compared to 49 CFR 195

Appendix D Spill Prevention, Control and Countermeasure (SPCC) Plan and Emergency Response Plan (ERP)

Appendix E Past, Present, and Reasonably Foreseeable Future Project Descriptions

Appendix F Pipeline Temperature Effects Study

Appendix G Pipeline Risk Assessment and Environmental Consequence Analysis

Appendix H CONFIDENTIAL – NOT USG CLASSIFIED 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 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)

Appendix 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)

Appendix K Supporting Meeting Summaries, Consultation Letters and Communications

Appendix L CONFIDENTIAL – NOT USG CLASSIFIED Summary of April 2010 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment

Appendix M CONFIDENTIAL – NOT USG CLASSIFIED Summary of April 2011 Aerial Searches for Greater Sage-grouse Leks, Keystone XL Pipeline Project Steele City Segment

Appendix 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)

Appendix 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

Appendix 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 Correspondences

Appendix Q CONFIDENTIAL – NOT USG CLASSIFIED 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

Appendix 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

List of Tables

Table 1.3-1 Summary of Species Included in Analysis and Findings 1.0-6

Table 2.1-1 Keystone XL Project Facilities by State 2.0-2

Table 2.1-2 Summary of Lands Affected for the Proposed Project 2.0-16

Table 2.1-3 Locations and Acreages of Proposed Pipe Storage Sites, Railroad Sidings, and Contractor Yards 2.0-23

Table 2.1-4 Construction Camp Permits and Regulations 2.0-24

Table 2.1-5 Summary of Aboveground Facilities 2.0-31

Table 2.1-6 Pipeline Construction Spreads Associated with the Proposed Project 2.0-34

Table 2.1-7 Minimum Pipeline Cover 2.0-42

Table 2.1-8 Potential Water Sources along the Project Route[a, b, c, d] 2.0-44

Table 2.1-9 Waterbodies and Wetlands Crossed Using the Horizontal Directional Drilling Method 2.0-51

Table 2.1-10 Summary of Power Supply Requirements for the Proposed Project Pump Stations 2.0-54

Table 2.1-11 Resulting Cross-Country Construction Times Based on Estimates of Schedule 2.0-56

Table 2.2-1 Representative Past Projects Considered in the Cumulative Effects Assessment 2.0-67

Table 2.2-2 CEA Matrix—Threatened, Endangered, and Candidate Species 2.0-76

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 ..... 3.0-7

Table 3.1-2 Wetlands Crossed by Transmission Lines within the Central Flyway Whooping Crane Migration Corridor[a] 3.0-21

Table 3.1-3 South Dakota American Burying Beetle Habitat Suitability Acreage 3.0-40

Table 3.1-4 Suitability Ratings of American Burying Beetle Habitat in Route Modifications in South Dakota 3.0-40

Table 3.1-5 Estimated American Burying Beetle Habitat Acreage Impacts in Nebraska 3.0-42

Table 3.1-6 Suitability Ratings of American Burying Beetle Habitat in Route Modifications in Nebraska 3.0-47

Table 3.1-6 Incidence of Modeled Soil Temperatures at Freezing or Below with Varying Distance from the Pipeline Centerline at Varying Depths[a] 3.0-55

Table 3.2-1 Occurrence Surveys for the Piping Plover along the Proposed Project Right of Way in 2008, 2011, and 2012[a] 3.0-65

List of Figures

Figure 2.1.5-1 Project Overview 2.0-3

Figure 2.1.5-2 Project Overview (Montana) 2.0-5

Figure 2.1.5-3 Project Overview (North Dakota) 2.0-7

Figure 2.1.5-4 Project Overview (South Dakota) 2.0-9

Figure 2.1.5-5 Project Overview (Nebraska) 2.0-11

Figure 2.1.5-6 Project Overview (Kansas) 2.0-13

Figure 2.1.5-7 Typical 110-foot Construction ROW (36-inch Pipeline) with Topsoil Removal only over Trench Line 2.0-19

Figure 2.1.5-8 Typical 110-foot Construction ROW (36-inch Pipeline) Spoil Side Adjacent and Co-located to Existing Pipeline 2.0-21

Figure 2.1.8-1 Proposed Temporary Construction Camp 2.0-25

Figure 2.1.10-1 Construction Spreads 2.0-37

Figure 2.1.10-2 Typical Pipeline Construction Sequence 2.0-39

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 2.0-79

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 2.0-81

Figure 3.1.3-1 Central Flyway Whooping Crane Migration Corridor for the Aransas-Wood Buffalo Population 3.0-17

Figure 3.1.4-1 Pallid Sturgeon Priority Management Recovery Area 3.0-27

Figure 3.1.5-2 American Burying Beetle habitat ratings in South Dakota and Nebraska. 3.0-37

Figure 3.1.5-3 Preliminary Range of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010) 3.0-43

Figure 3.1.5-4 Descriptive Map of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010) 3.0-45

Figure 3.1.5-5 Results of 2012 sampling in relation to proposed reroute 3.0-51

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. 3.0-53

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

-Page Intentionally Left Blank-

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.

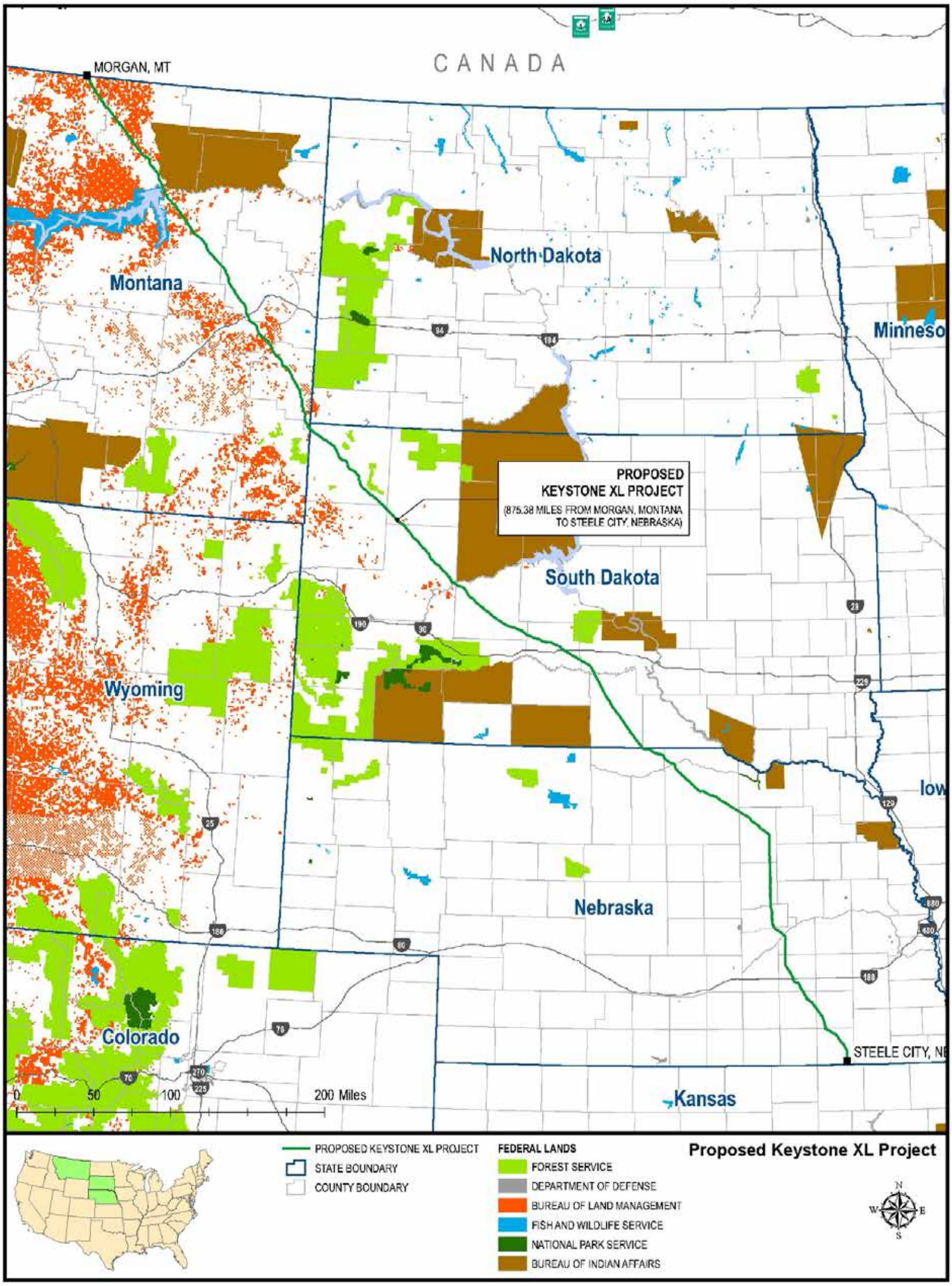


Figure 2.1.5-1 Project Overview

-Page Intentionally Left Blank-

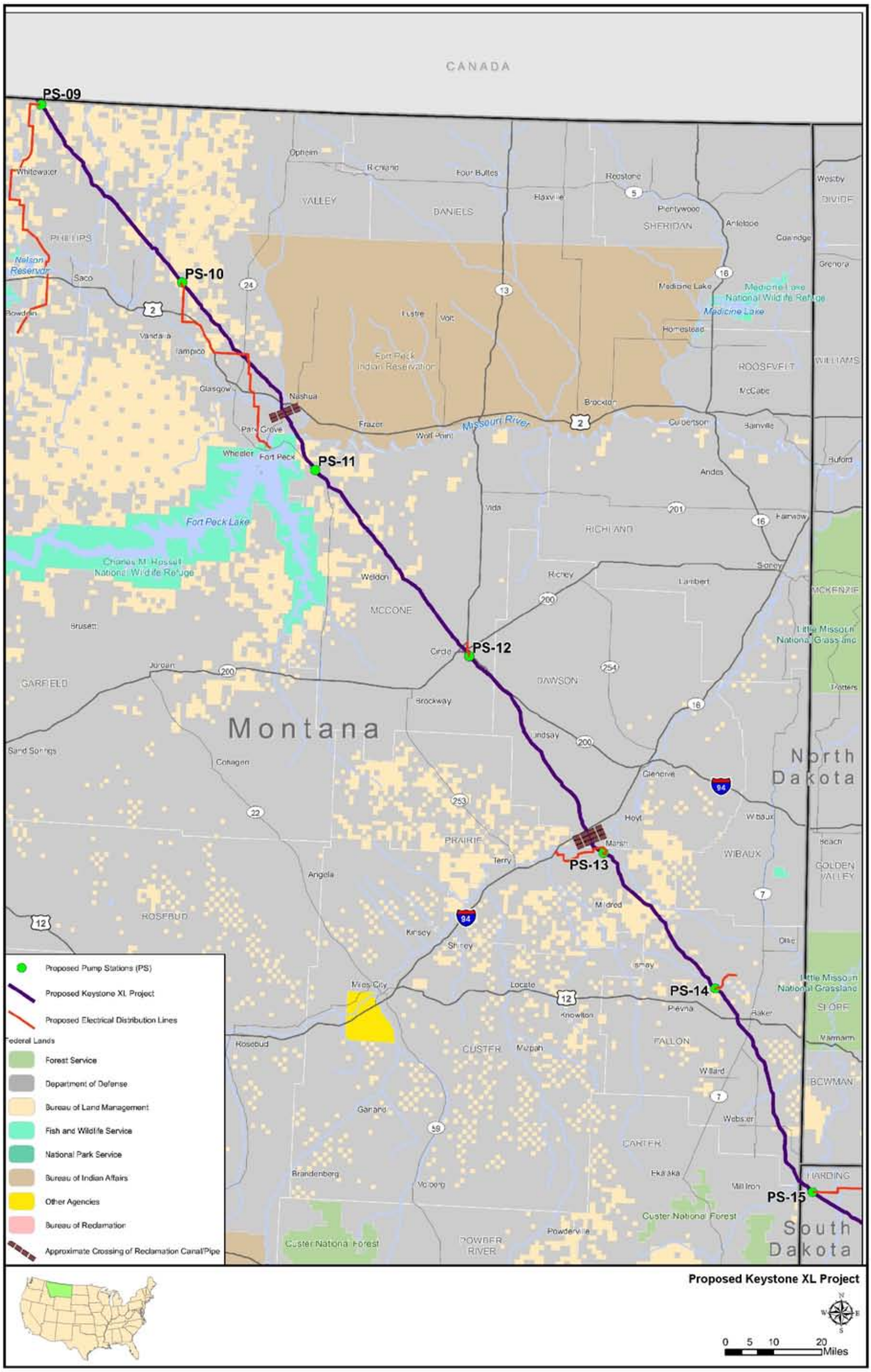


Figure 2.1.5-2 Project Overview (Montana)

-Page Intentionally Left Blank-

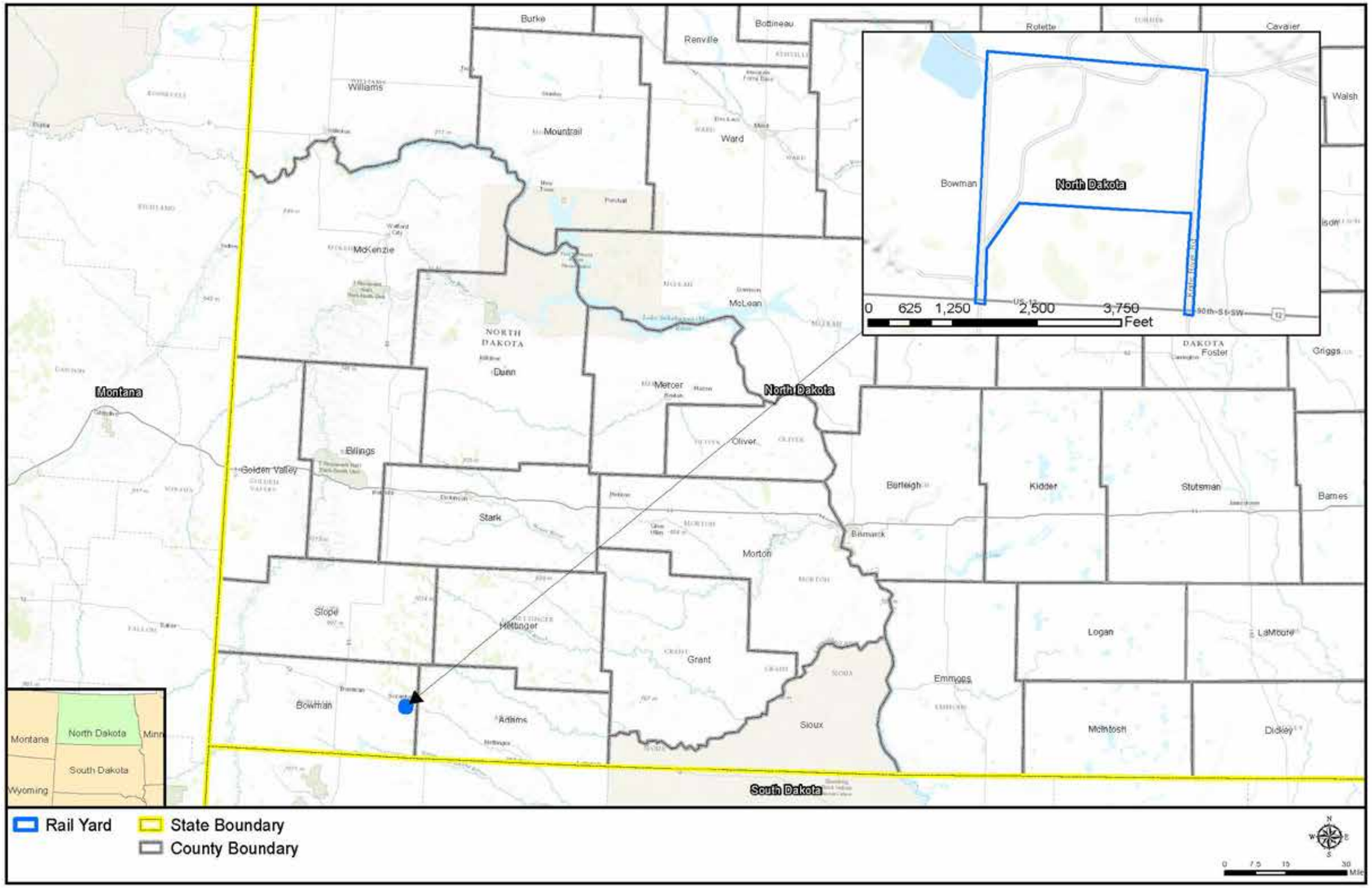


Figure 2.1.5-3 Project Overview (North Dakota)

-Page Intentionally Left Blank-

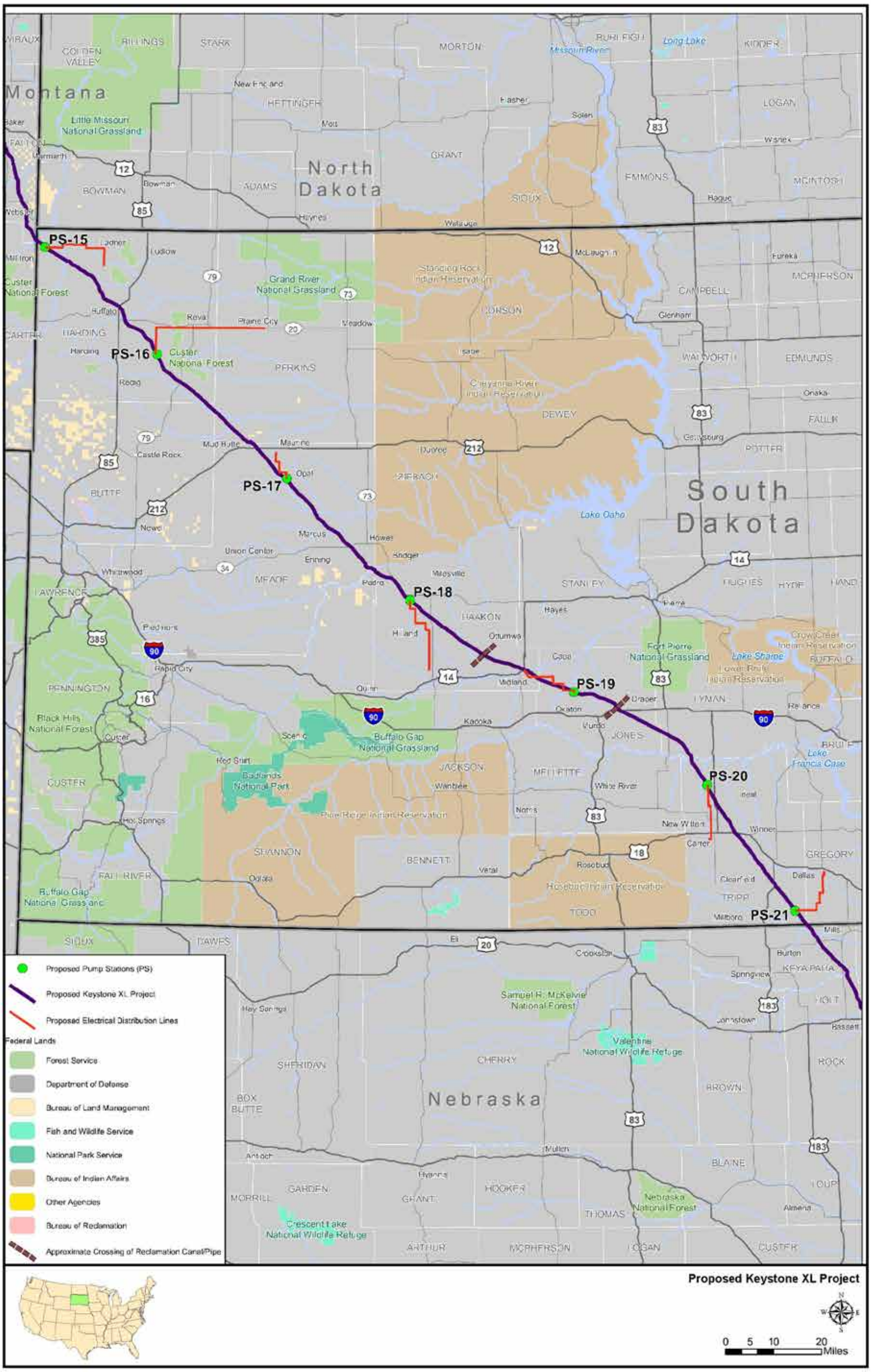


Figure 2.1.5-4 Project Overview (South Dakota)

-Page Intentionally Left Blank-

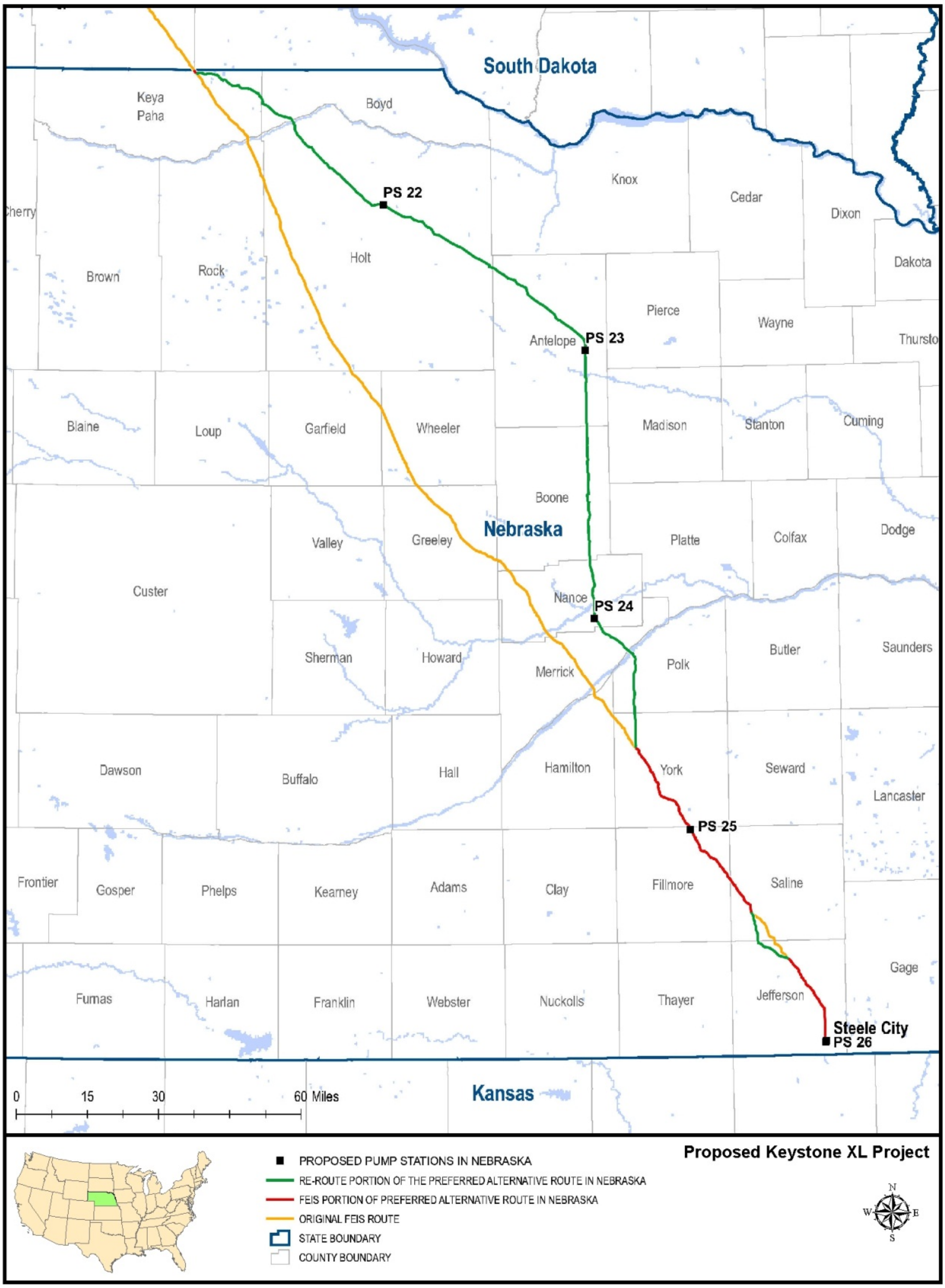


Figure 2.1.5-5 Project Overview (Nebraska)

-Page Intentionally Left Blank-

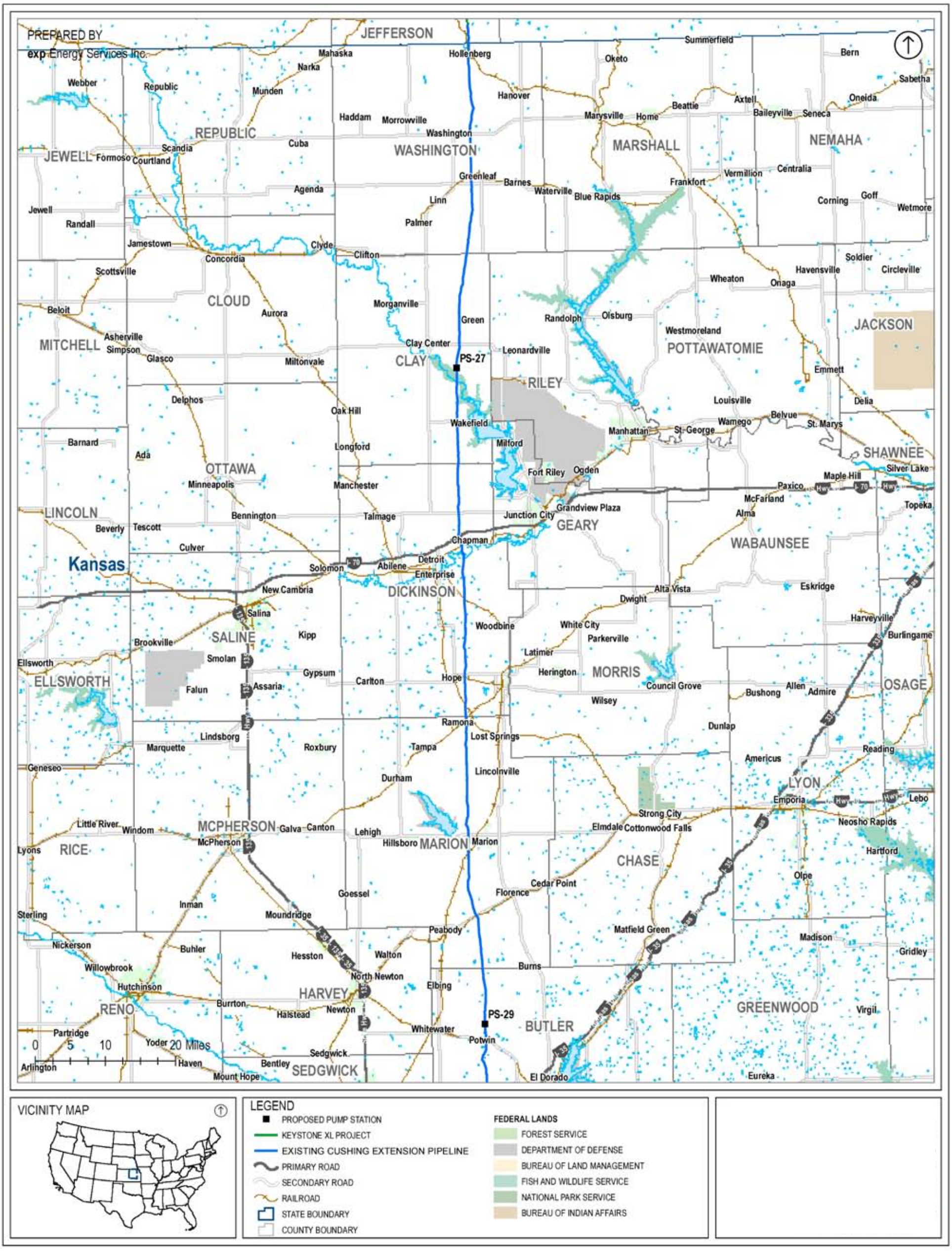


Figure 2.1.5-6 Project Overview (Kansas)

-Page Intentionally Left Blank-

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

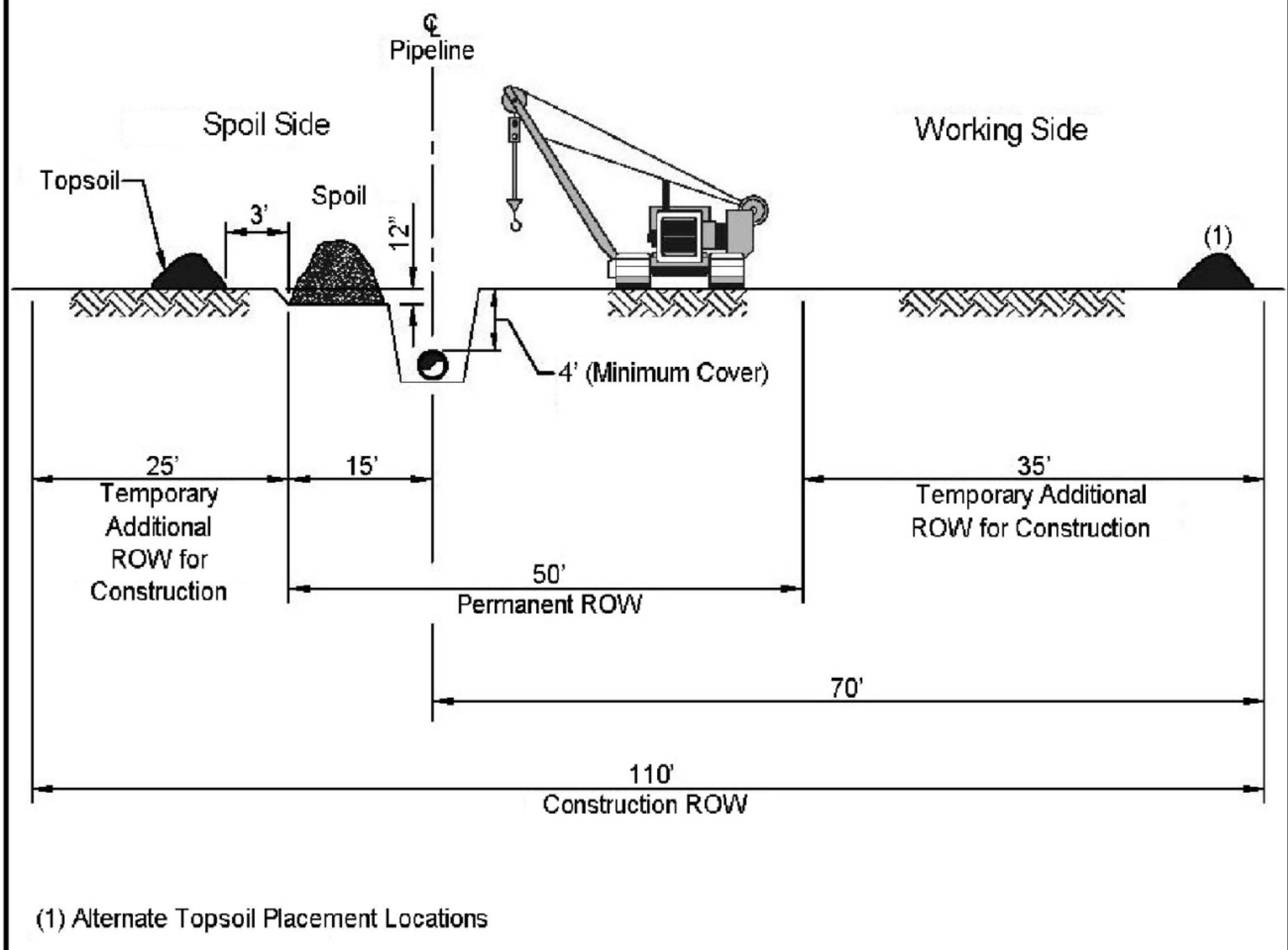
In addition to the typical construction ROW, Keystone has identified typical types of additional temporary workspace areas (TWAs) that would be required. These include areas requiring special construction techniques (e.g., river, wetland, and road/rail crossings, horizontal directional drilling (HDD), 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.



Proposed Keystone XL Project

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

-Page Intentionally Left Blank-

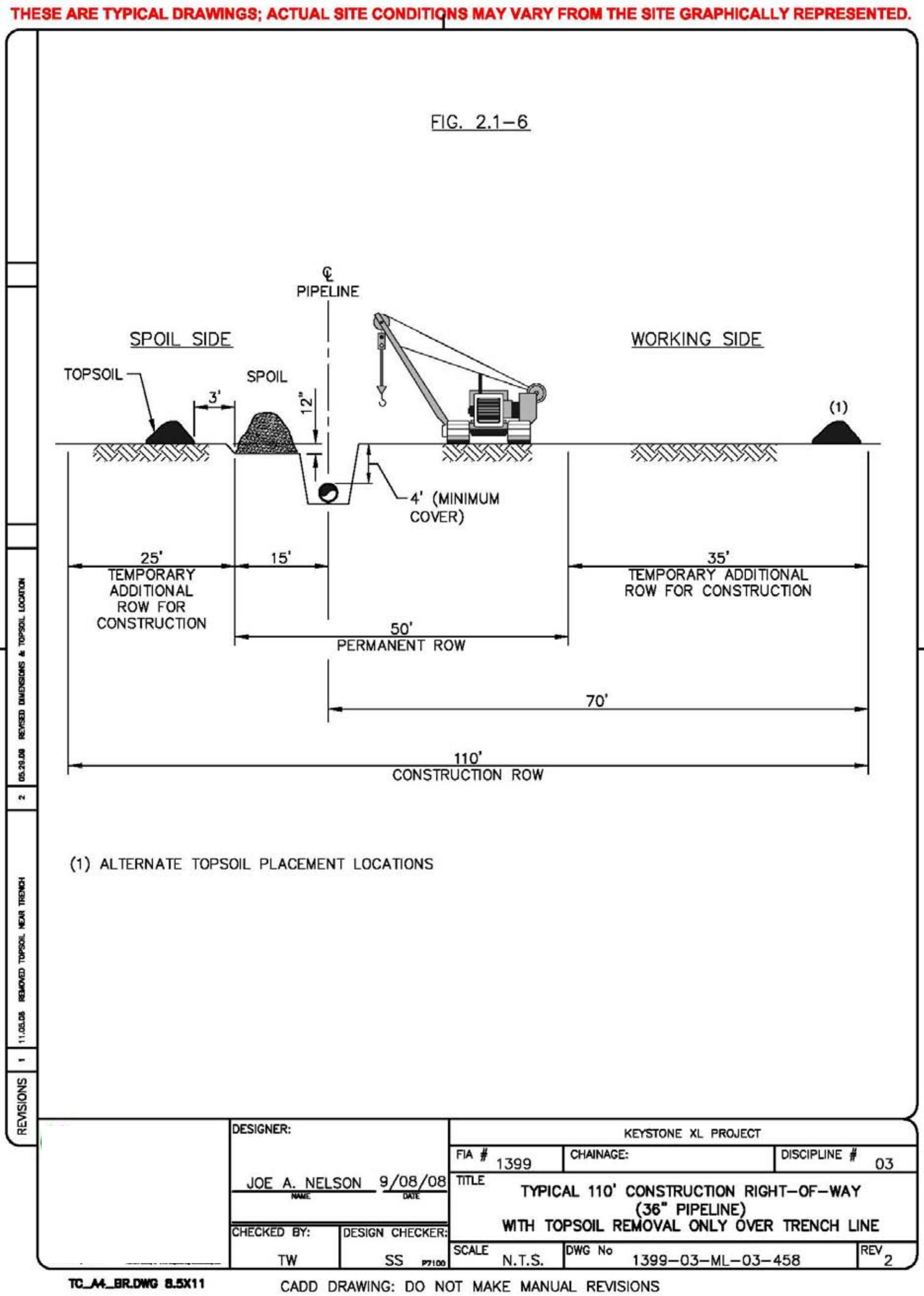


Figure 2.1.5-8 Typical 110-foot Construction ROW (36-inch Pipeline) Spoil Side Adjacent and Co-located to Existing Pipeline

-Page Intentionally Left Blank-

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

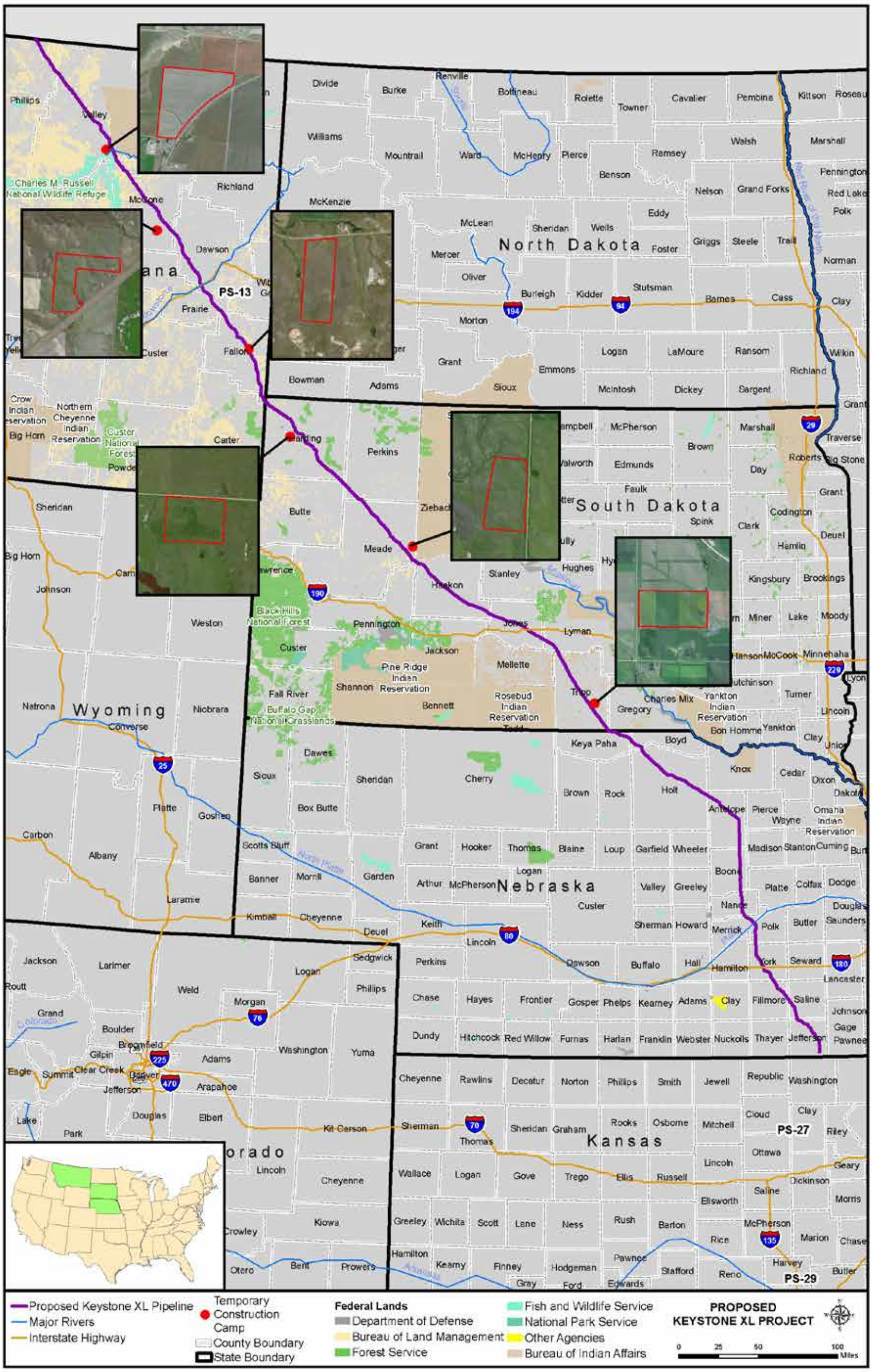
construction camps would be in Montana (McCone, Valley [2], and Fallon counties), and three camps would be in South Dakota (Tripp, Harding, and Meade counties) (the approximate location of six of these camps is shown in Figure 2.1.8-1). The total acreage for the seven camps planned in Montana and South 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

-Page Intentionally Left Blank-

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.

---

[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).

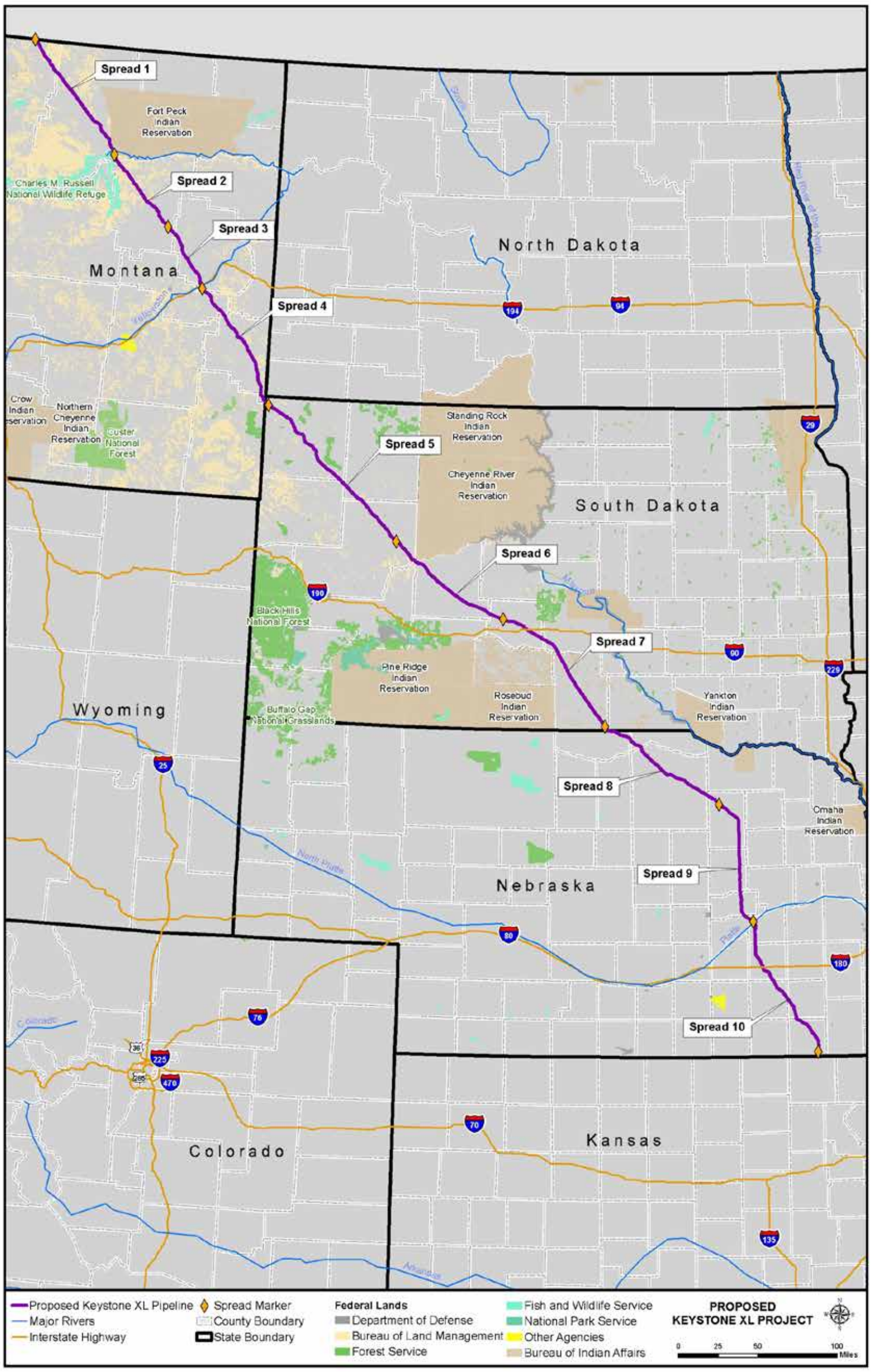
Table 2.1-6 Pipeline Construction Spreads Associated with the Proposed Project

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.

-Page Intentionally Left Blank-



Source: exp Energy Services, Inc. 2012.

Figure 2.1.10-1 Construction Spreads

-Page Intentionally Left Blank-

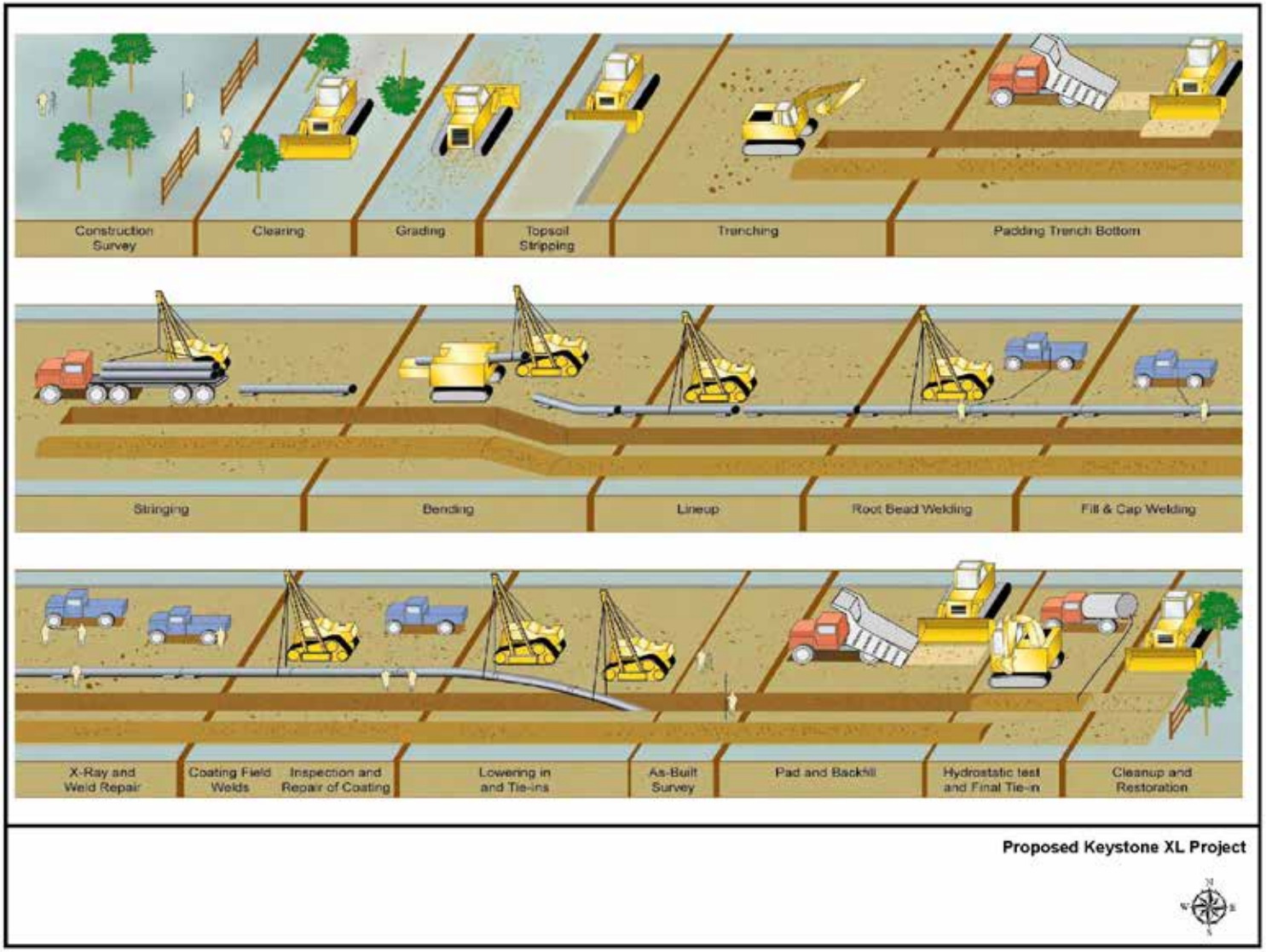


Figure 2.1.10-2 Typical Pipeline Construction Sequence

-Page Intentionally Left Blank-

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.

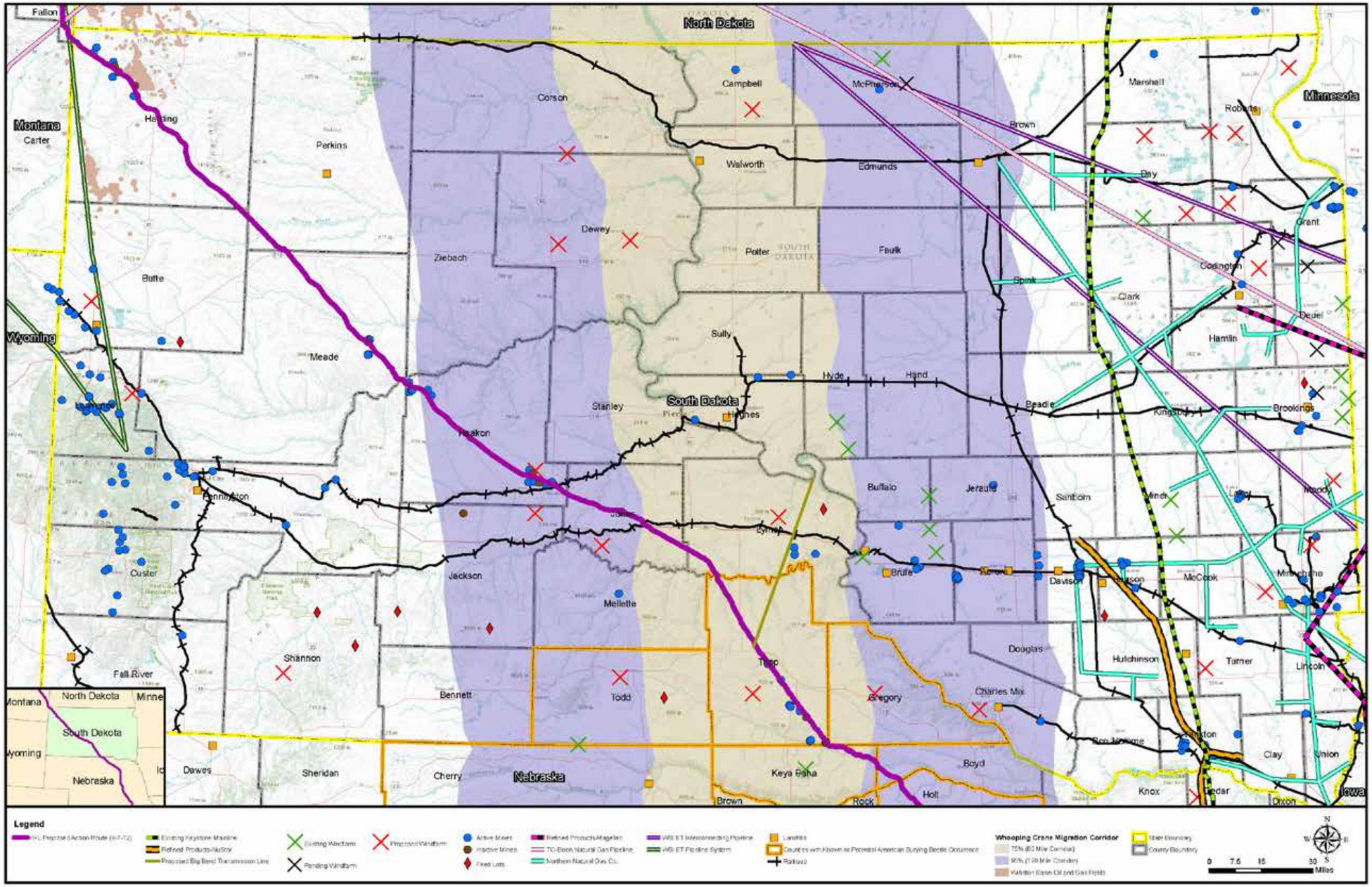


Figure 2.2.3-1 Known Locations of Past, Present, and Reasonably Foreseeable Future Projects in South Dakota with American Burying Beetle Areas of Potential Occurrence and Central Flyway Whooping Crane Migration Corridor

-Page Intentionally Left Blank-

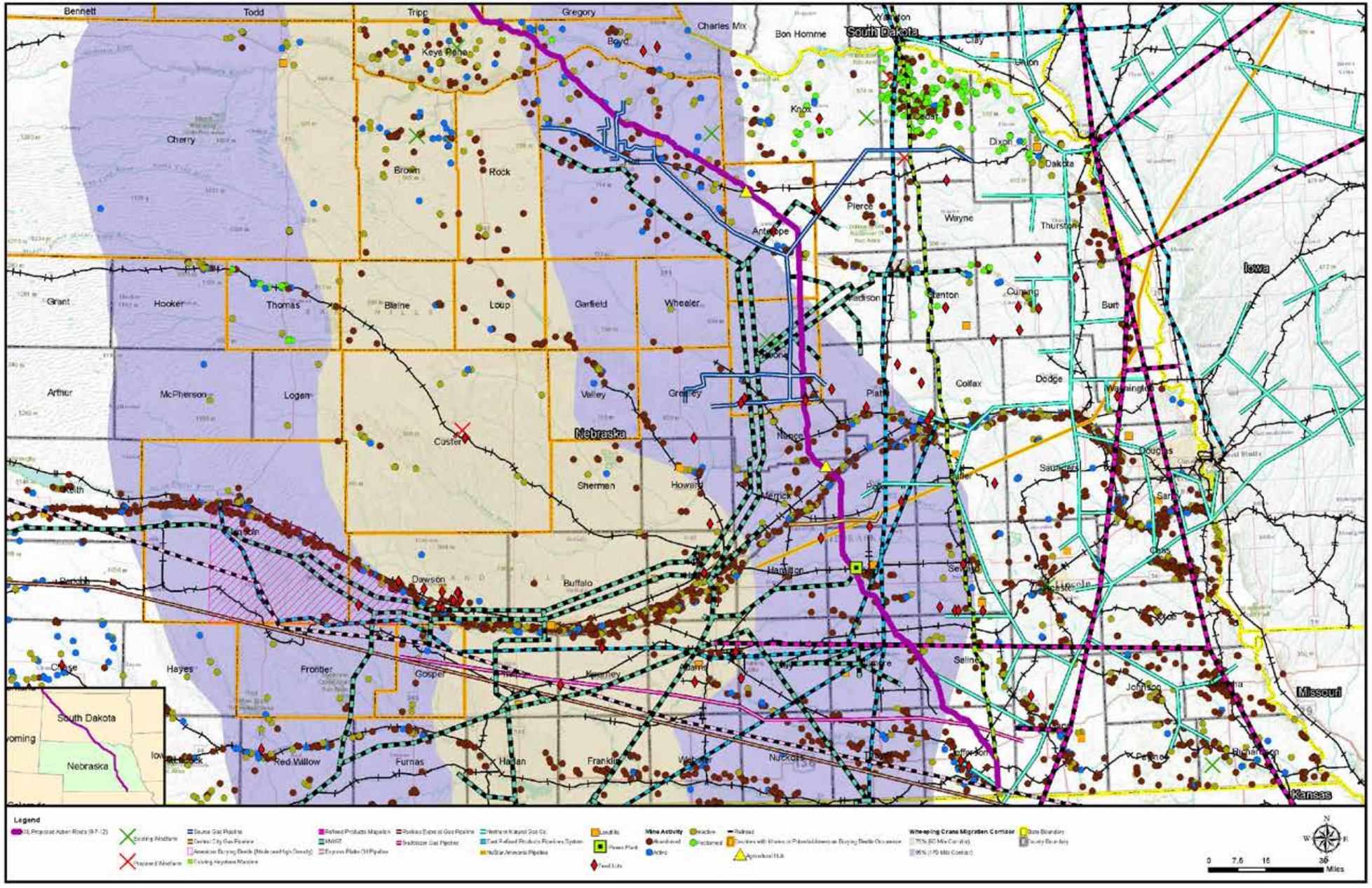


Figure 2.2.3-2 Known Locations of Past, Present, and Reasonably Foreseeable Future Projects in Nebraska with American Burying Beetle Areas of Potential Occurrence and Central Flyway Whooping Crane Migration Corridor

-Page Intentionally Left Blank-

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."

-Page Intentionally Left Blank-

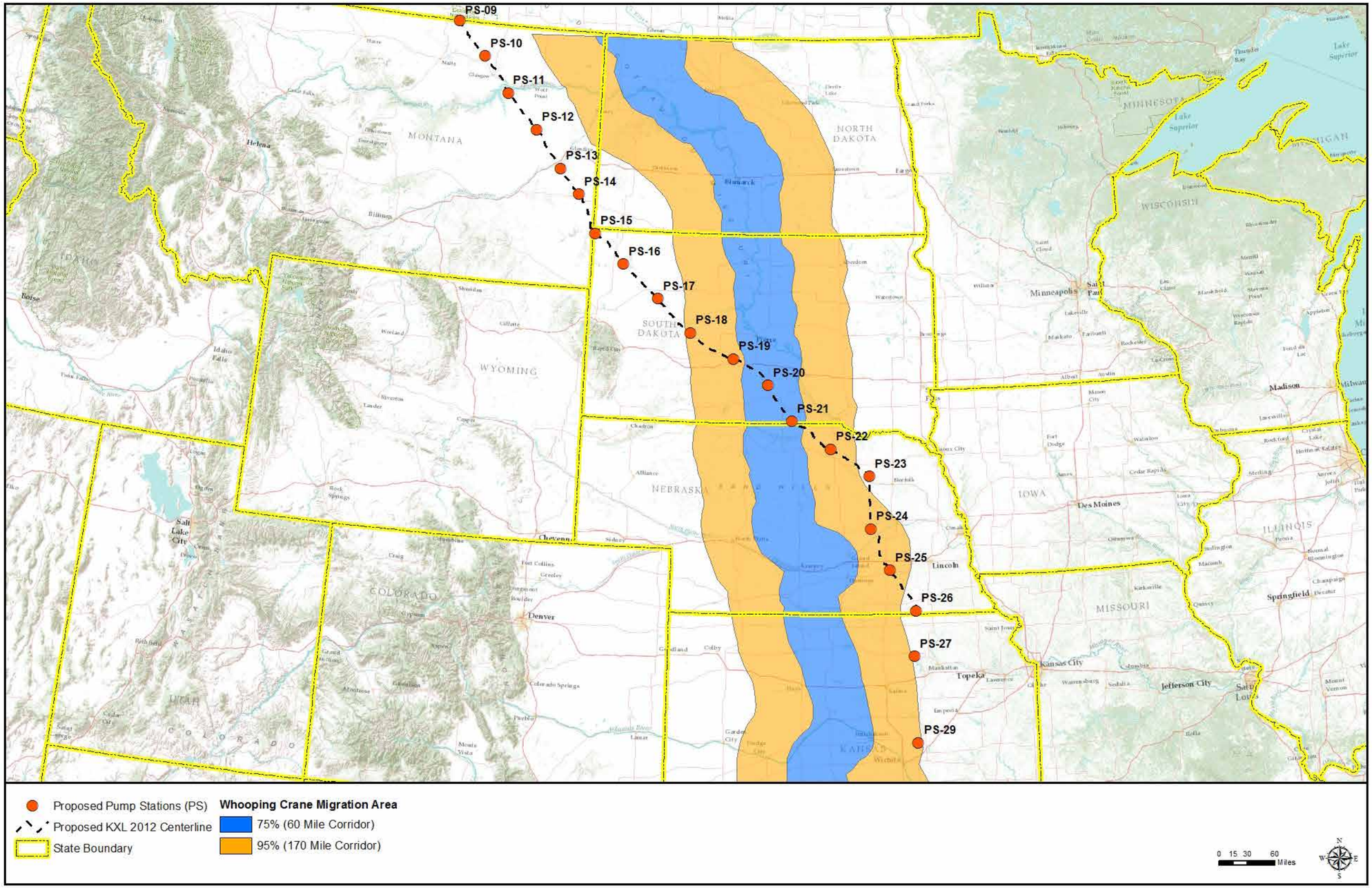


Figure 3.1.3-1 Central Flyway Whooping Crane Migration Corridor for the Aransas-Wood Buffalo Population

-Page Intentionally Left Blank-

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.

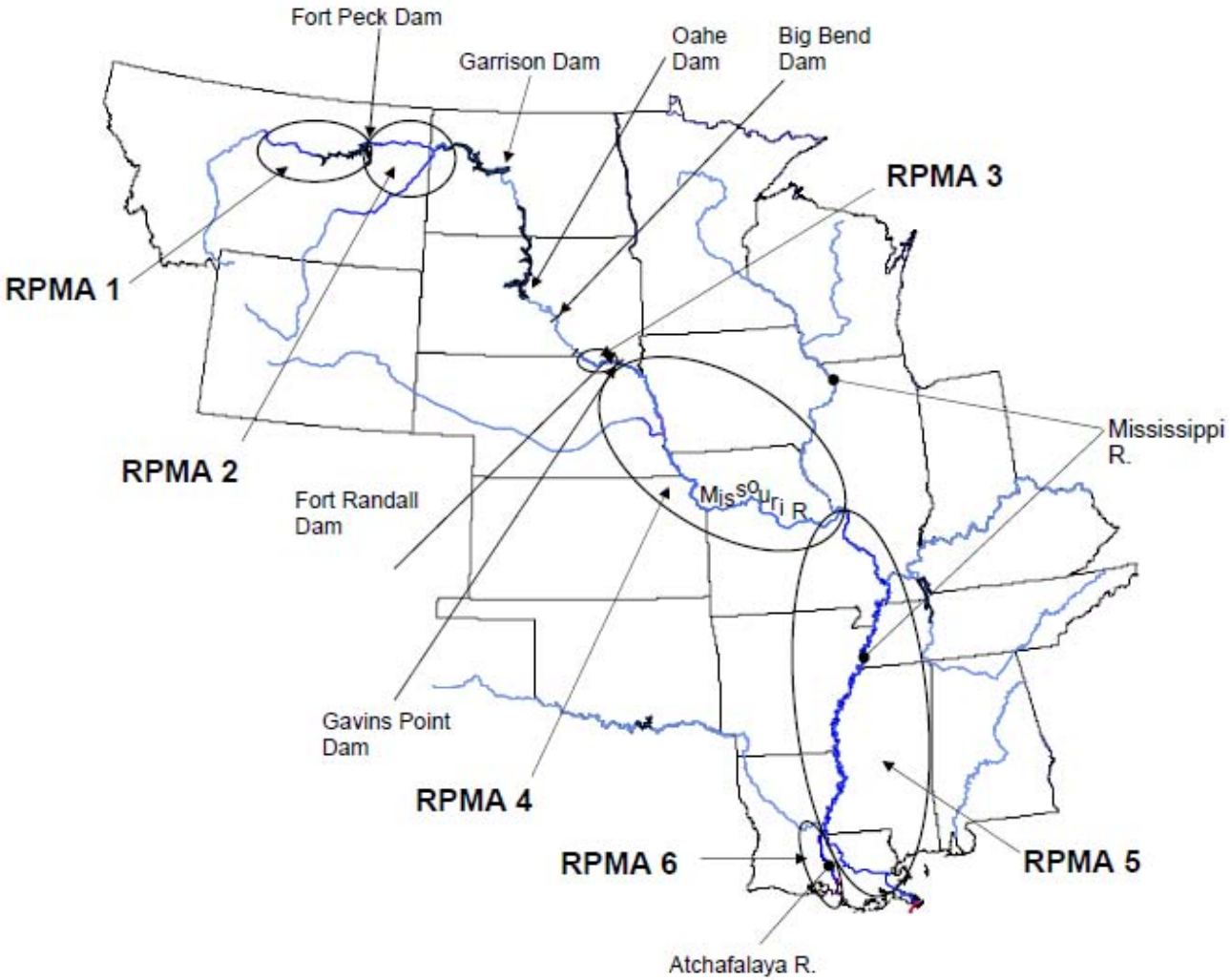
The pallid sturgeon is found in big river systems including the Missouri River and its major tributaries including the Yellowstone, Niobrara, and Platte rivers. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and main channel waters form the large-river ecosystem that provides macrohabitat 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

-Page Intentionally Left Blank-

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.

-Page Intentionally Left Blank-

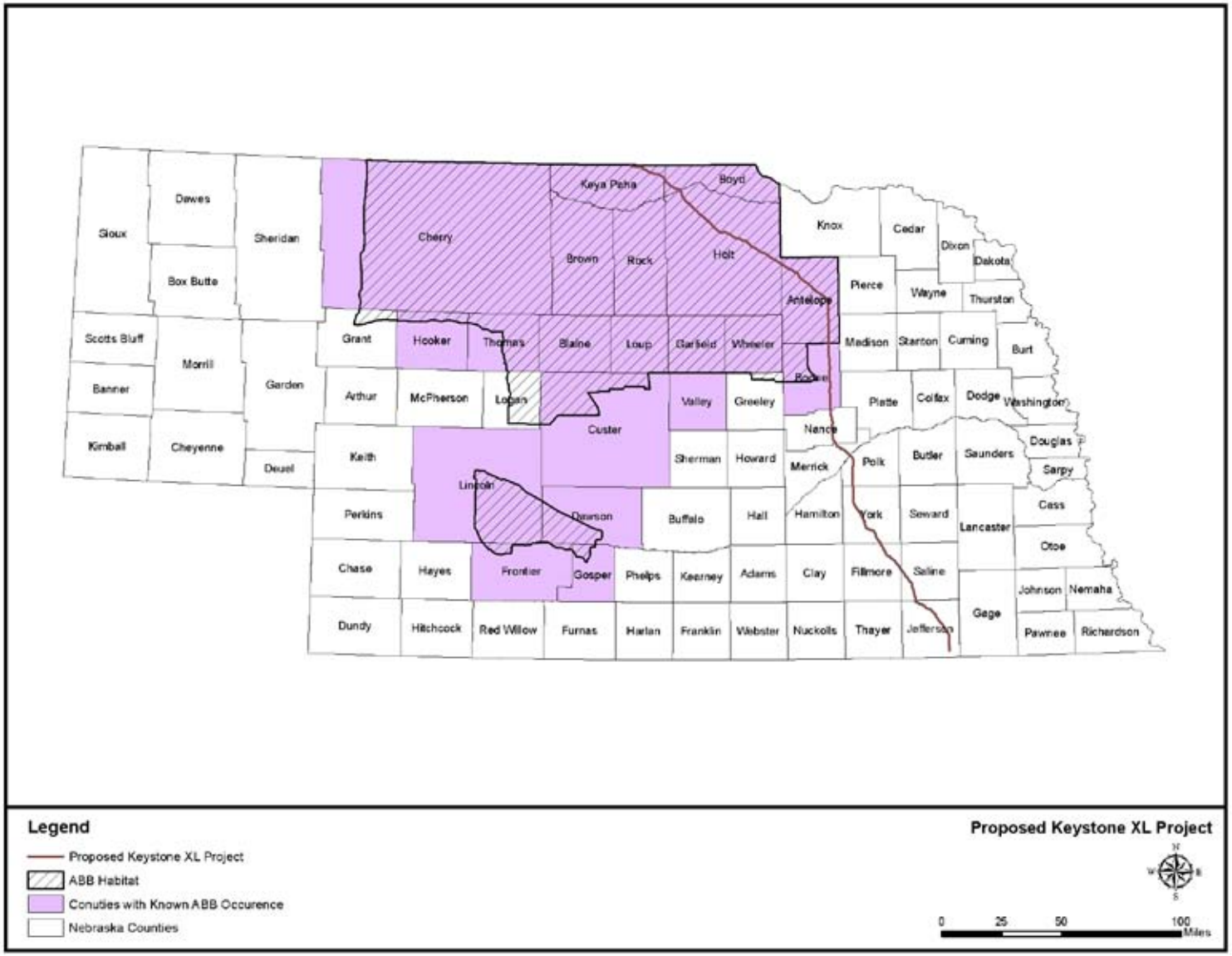


Figure 3.1.5-1 American Burying Beetle habitat and occurrence in Nebraska (USFWS Ecological Field Services Office, Grand Island, Nebraska).

-Page Intentionally Left Blank-

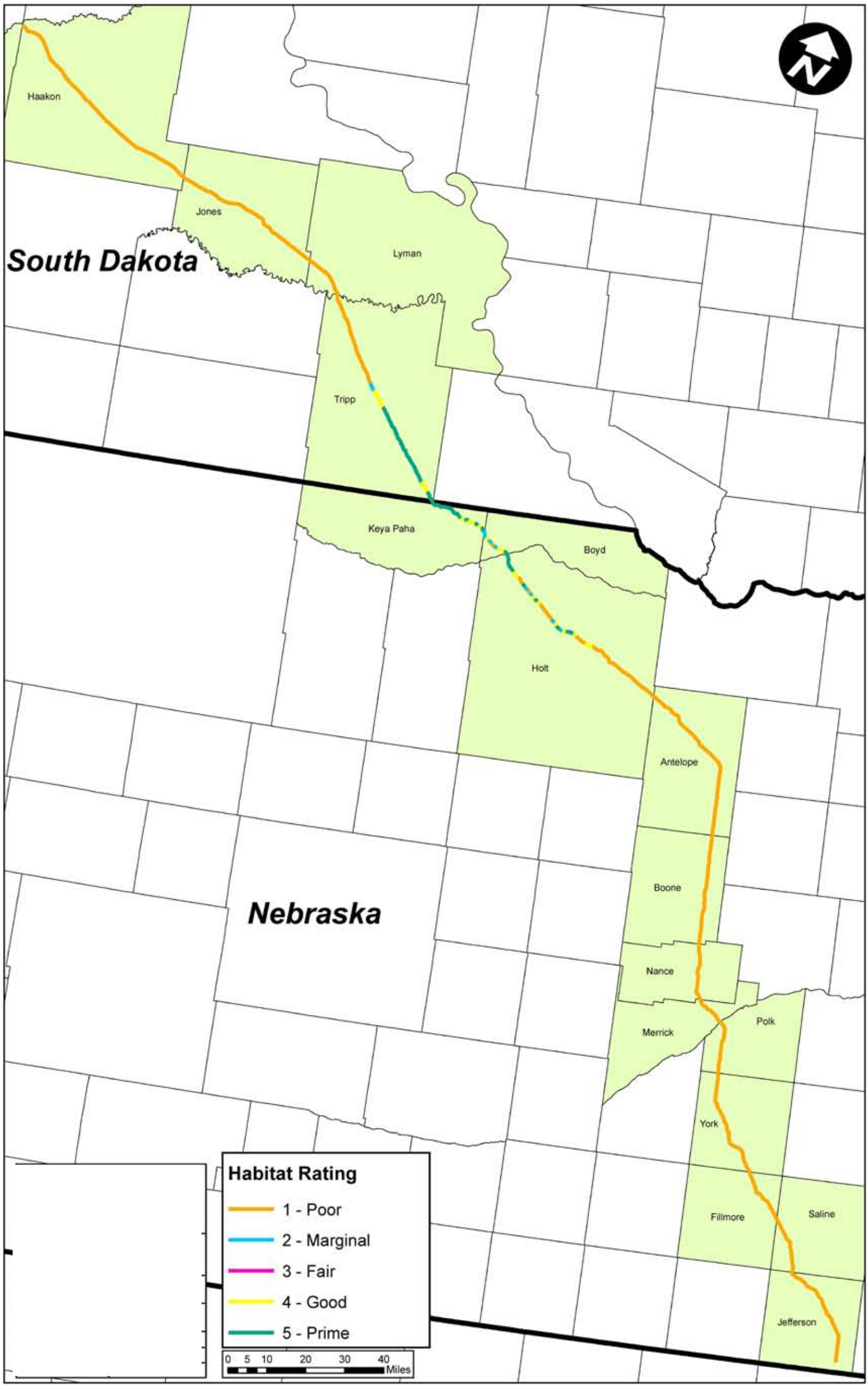


Figure 3.1.5-2 American Burying Beetle habitat ratings in South Dakota and Nebraska.

-Page Intentionally Left Blank-

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.

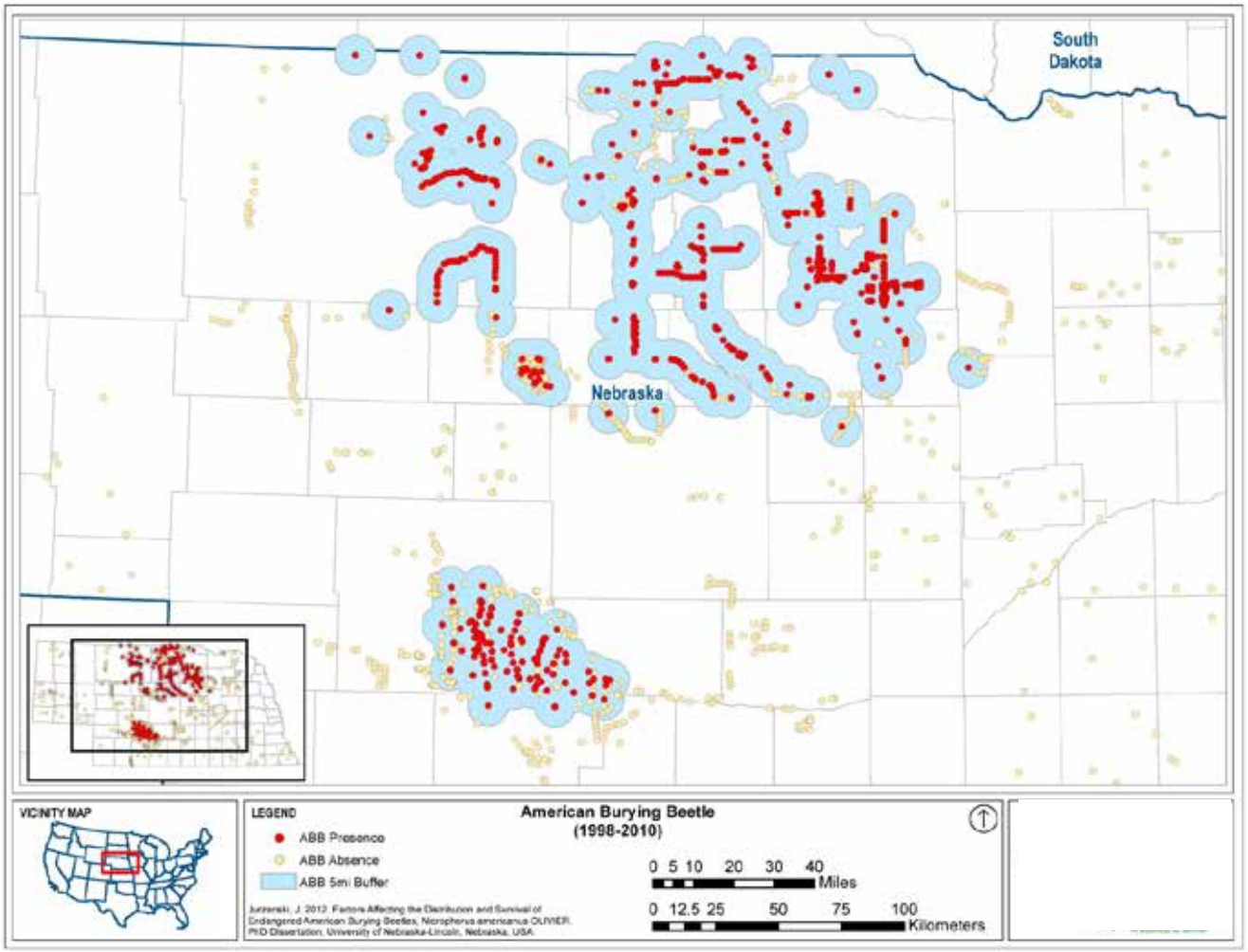


Figure 3.1.5-3 Preliminary Range of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010)

-Page Intentionally Left Blank-

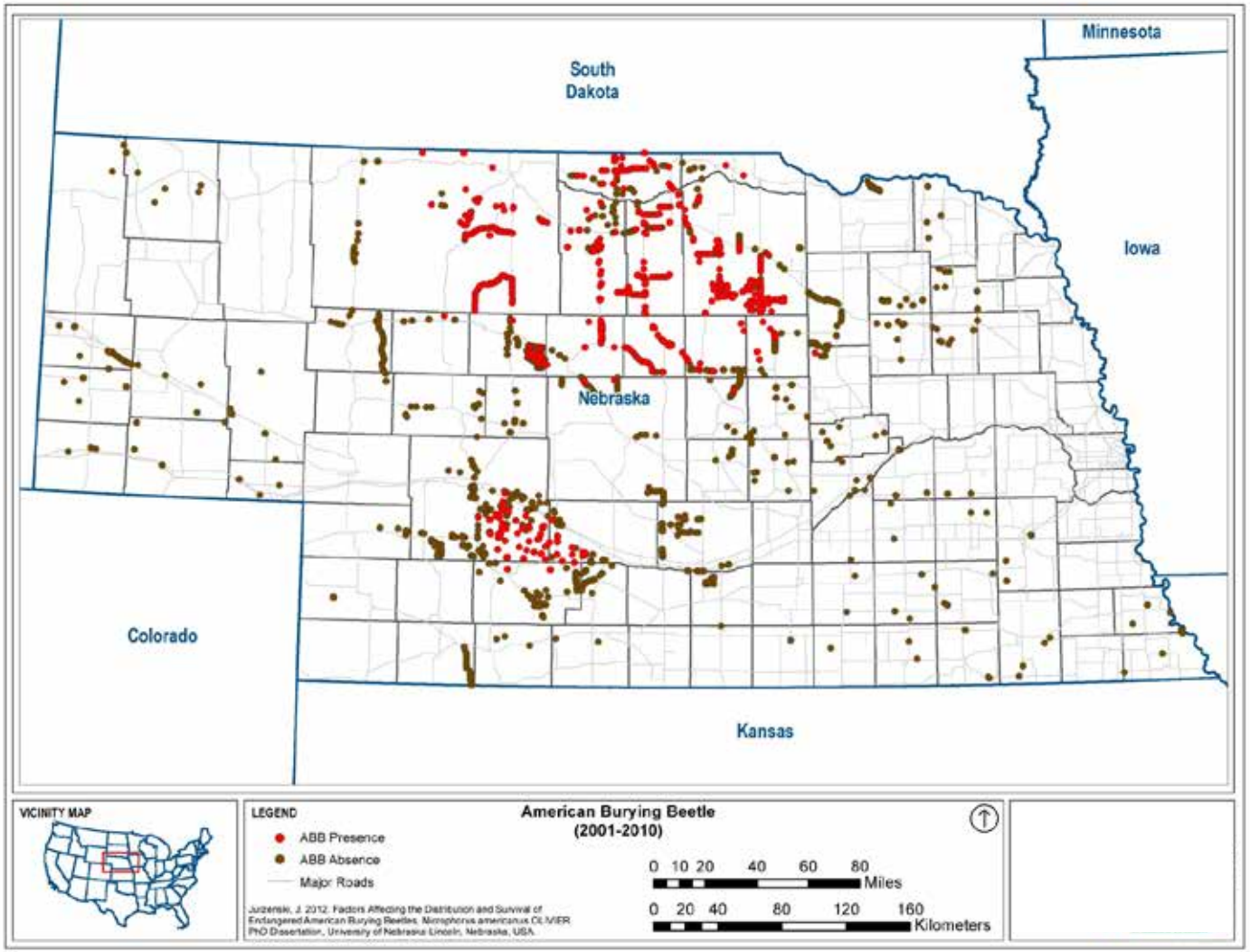


Figure 3.1.5-4 Descriptive Map of known American burying beetle presence in Nebraska (Jurzenski and Hoback 2010)

-Page Intentionally Left Blank-

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.

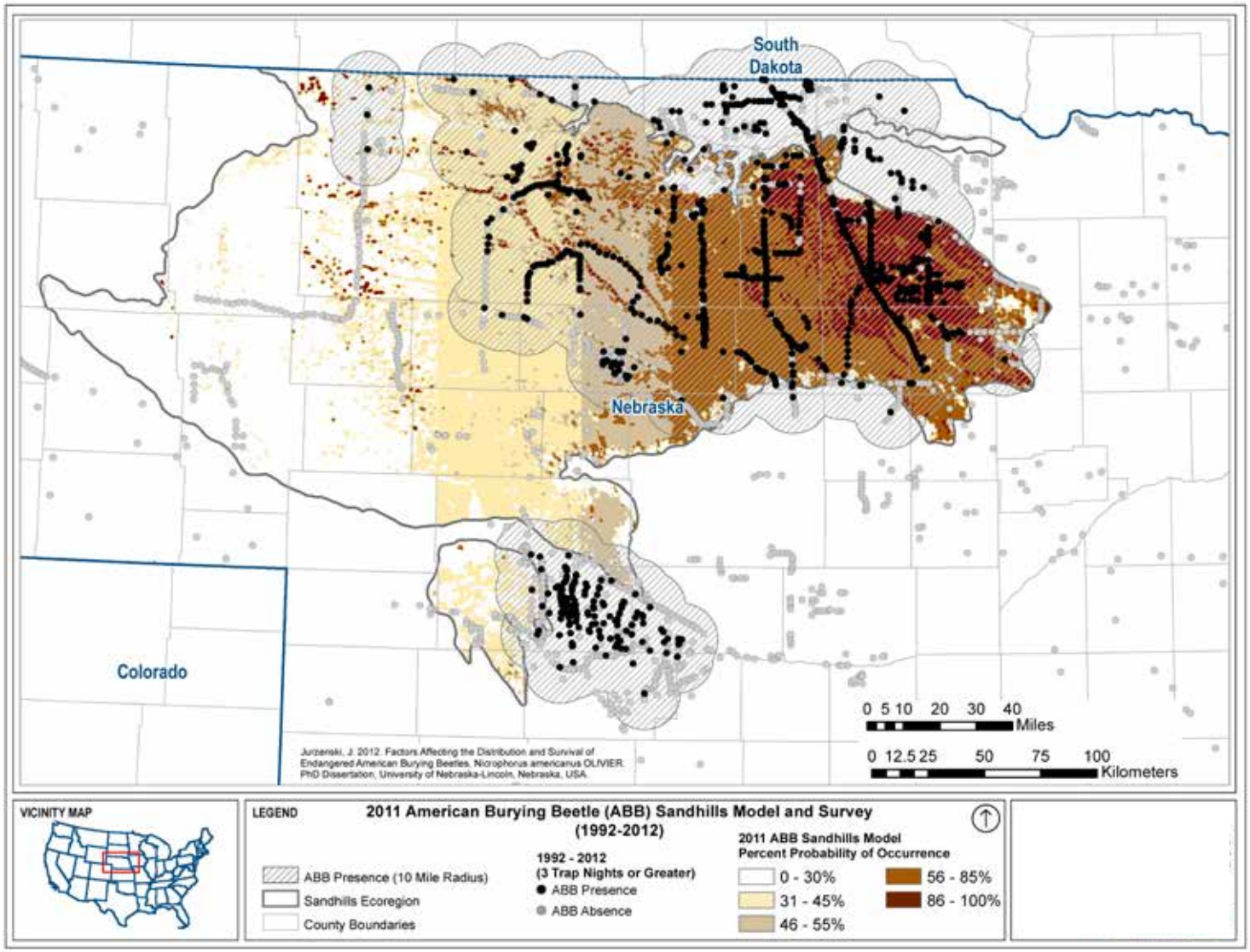


Figure 3.1.5-5 Results of 2012 sampling in relation to proposed reroute.

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

-Page Intentionally Left Blank-

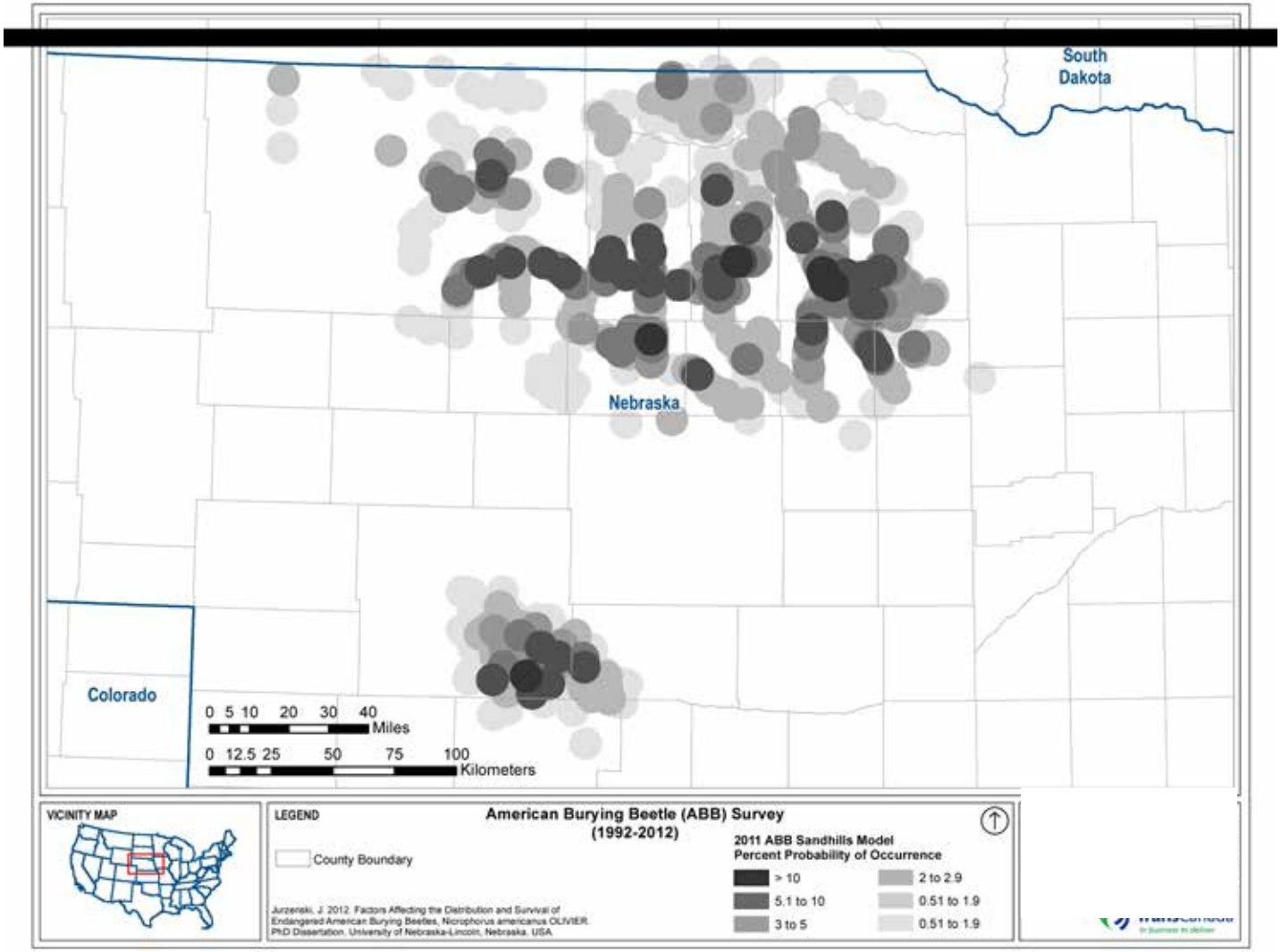


Figure 3.1.5-6 Trap data 1999-2012 where American burying beetle per trap night for three trap nights[1] are plotted (with a five mile buffer) as an estimate of American burying beetle density.

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

-Page Intentionally Left Blank-

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
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	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 V
F	Pipeline Temperature Effects Study	SEIS Appendix S
G	Pipeline Risk Assessment and Environmental Consequence Analysis	SEIS Appendix Q
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

Appendix A

Letters of Section 7 Consultation Commitments from Power Providers

-Page intentionally left blank-

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:

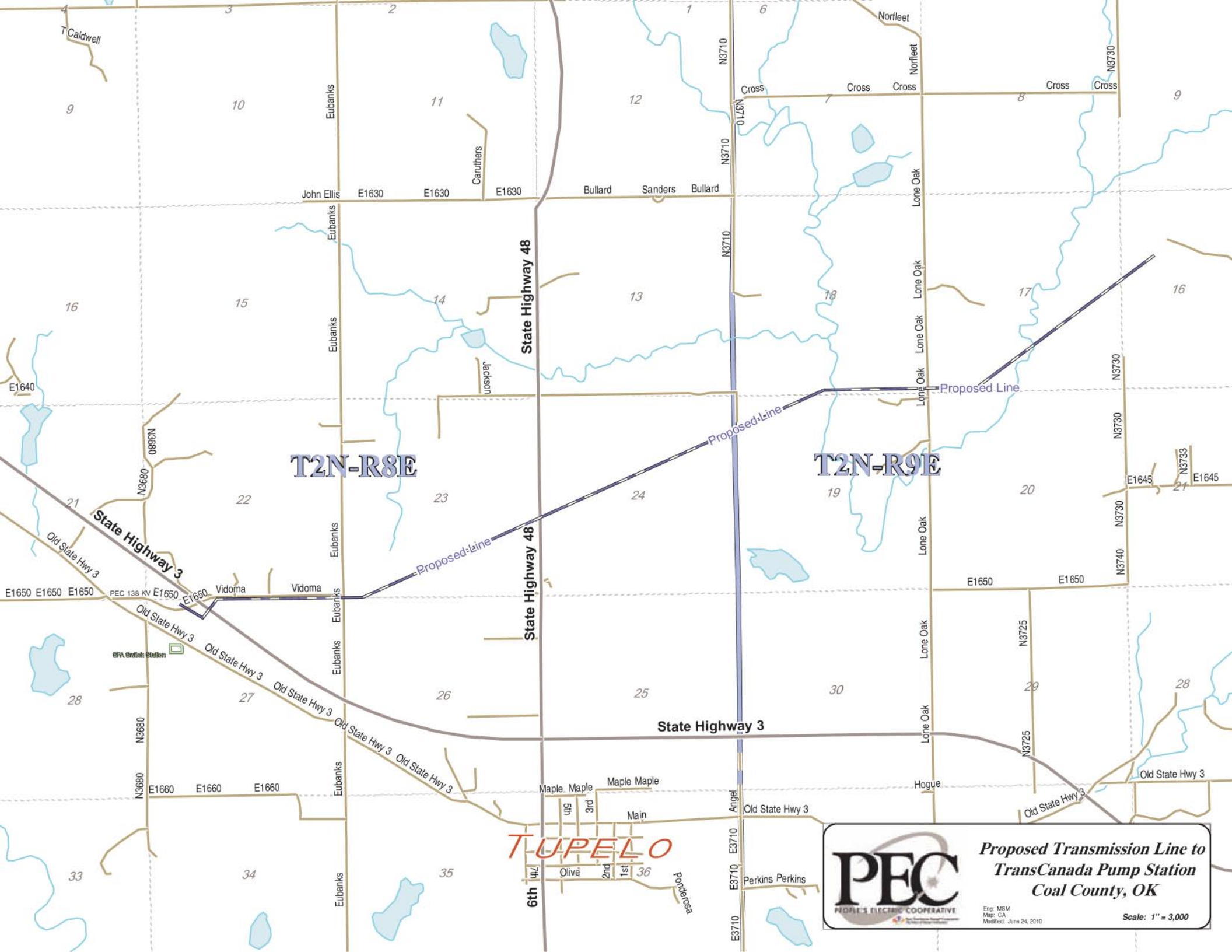
People's Electric Cooperative a power provider located in southeastern Oklahoma, is providing electric service to Pump Station #34 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed 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.

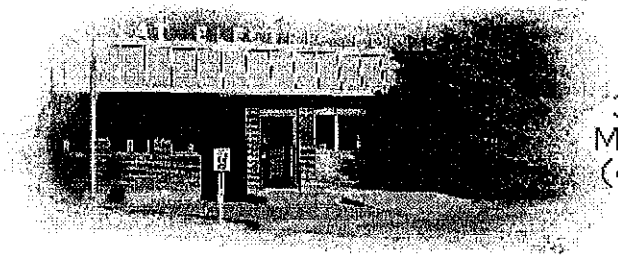
Enclosed are proposed maps of the power lines we intend to build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

John W. Hudson
Senior Vice President
Operations and Engineering


T2N-R8E
T2N-R9E
State Highway 48
State Highway 3
Old State Hwy 3
Proposed Line
Proposed Line
Proposed Line
Vidoma
Vidoma
PEC 138 KV
SPA Switch Station
TUPELO
Maple
Main
Olive
6th
7th
5th
3rd
2nd
1st
Ponderosa
Angel
Perkins
Hogue
Norfleet
Cross
Bullard
Sanders
John Ellis
Caruthers
Jackson
Eubanks
Lone Oak
T Caldwell
E1630
E1640
E1645
E1650
E1660
N3680
N3710
N3725
N3730
N3733
N3740
E3710
PEC
PEOPLE'S ELECTRIC COOPERATIVE
Proposed Transmission Line to
TransCanada Pump Station
Coal County, OK
Eng: MSM
Map: CA
Modified: June 24, 2010
Scale: 1" = 3,000

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.

-This page intentionally left blank-

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:

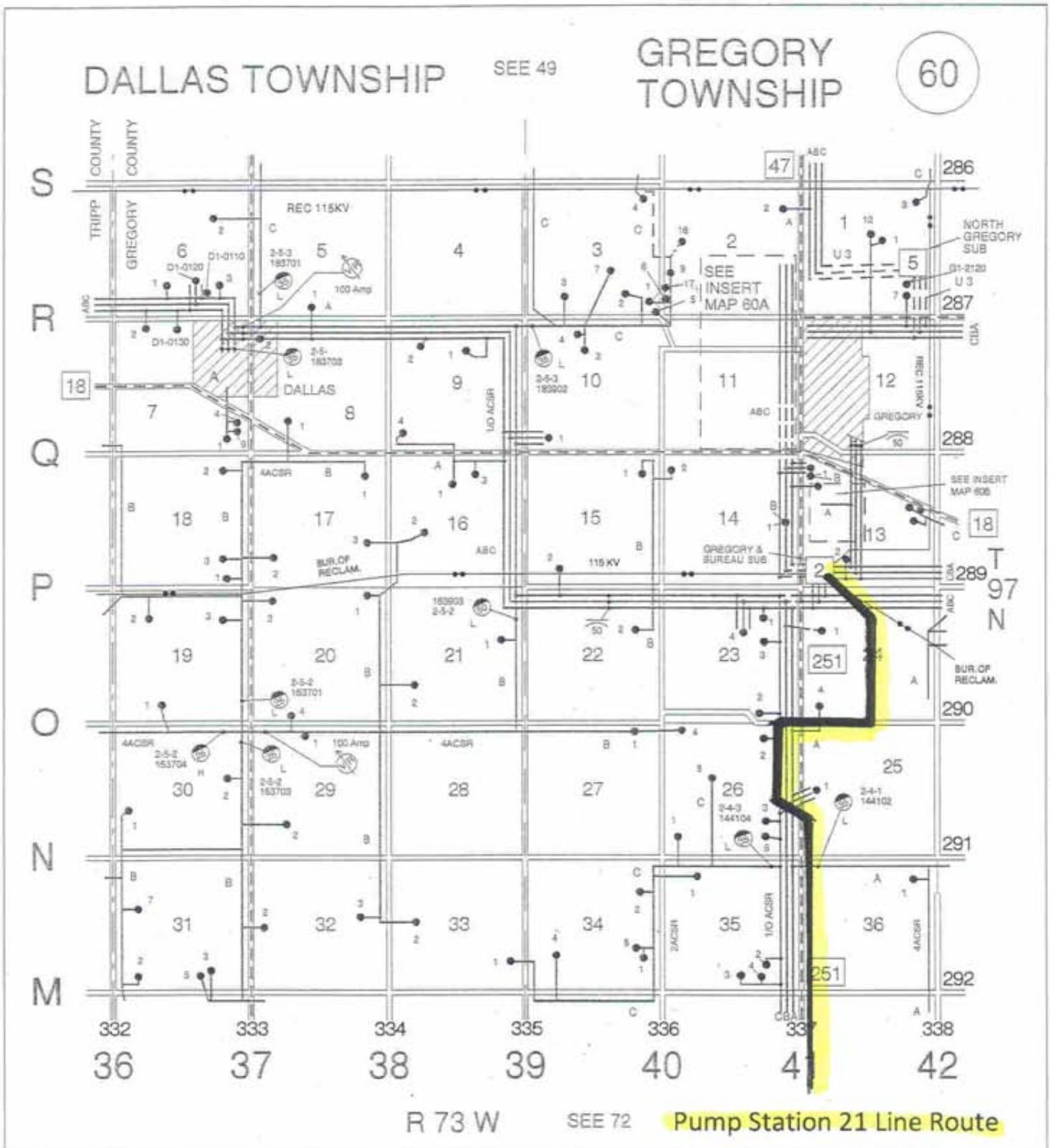
Rosebud Electric, a power provider located in Gregory SD, is providing electric service to Pump Station 20 and 21 of the Keystone XL Pipeline Project. As part of the environmental review of the Keystone XL Project, we understand certain impacts associated with the power lines being constructed by all 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.

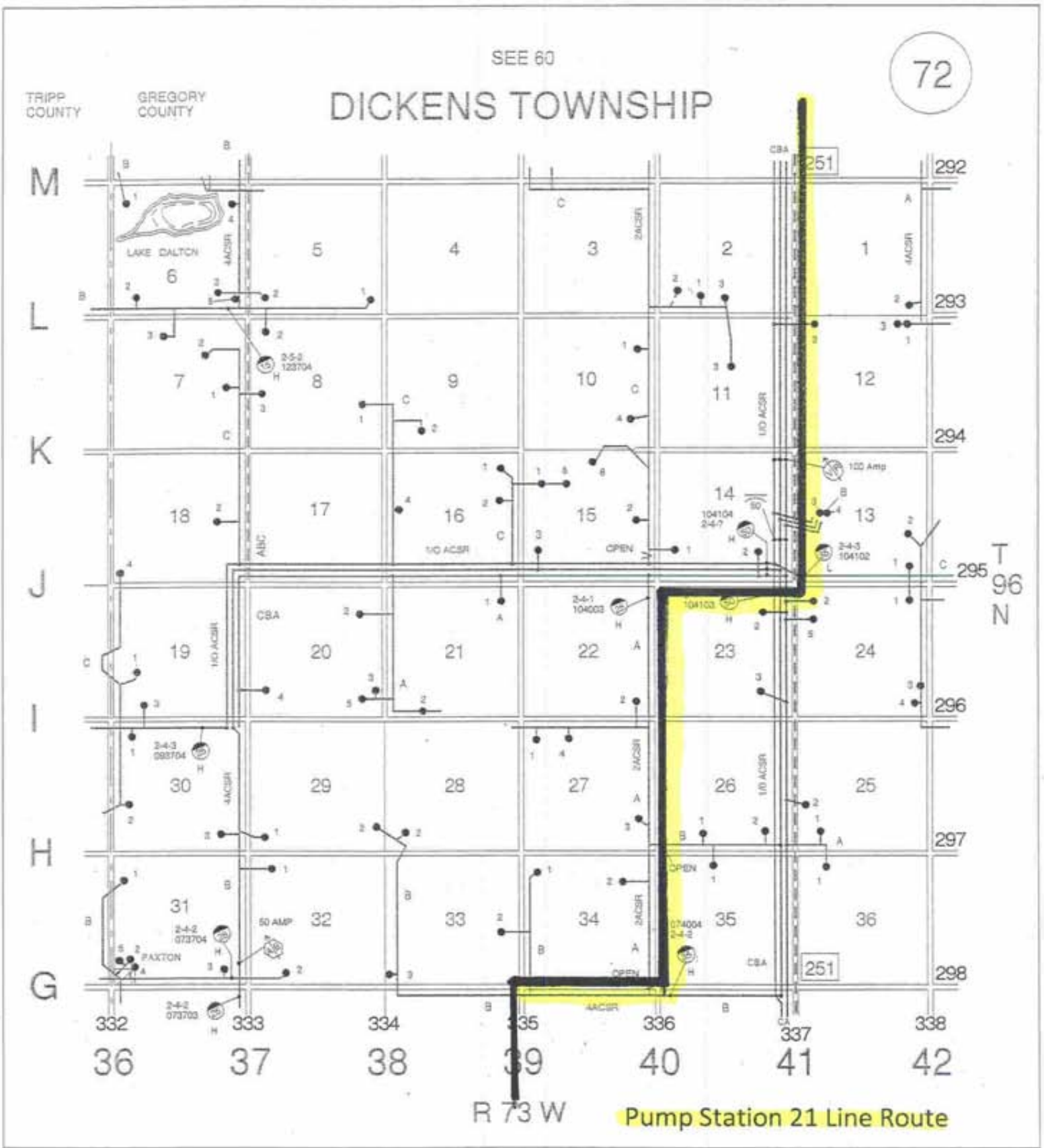
Enclosed are proposed maps ofthe power lines we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Sincerely,

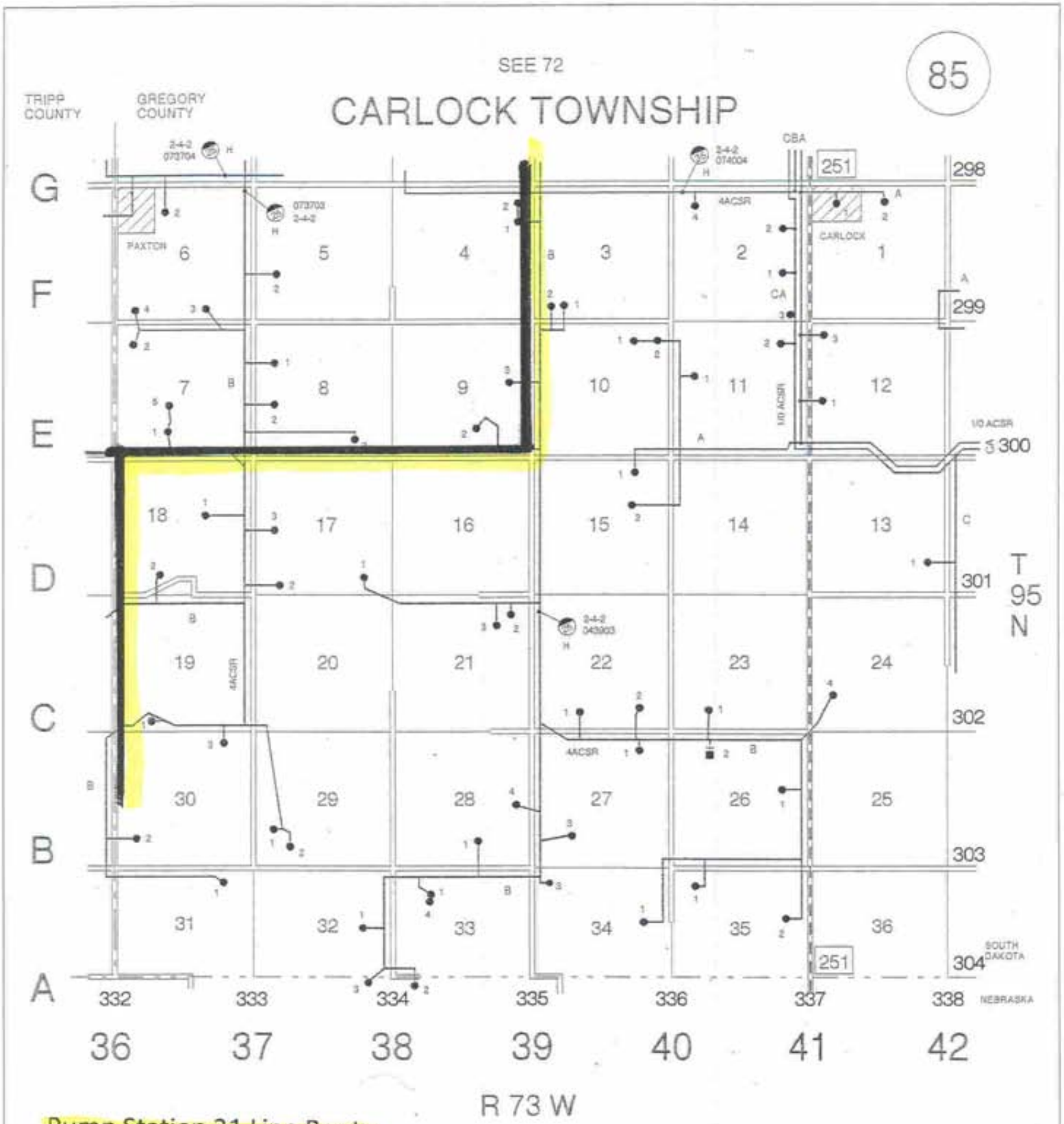
Gary Clayton, Manager Rosebud Electric Cooperative Inc.



Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile



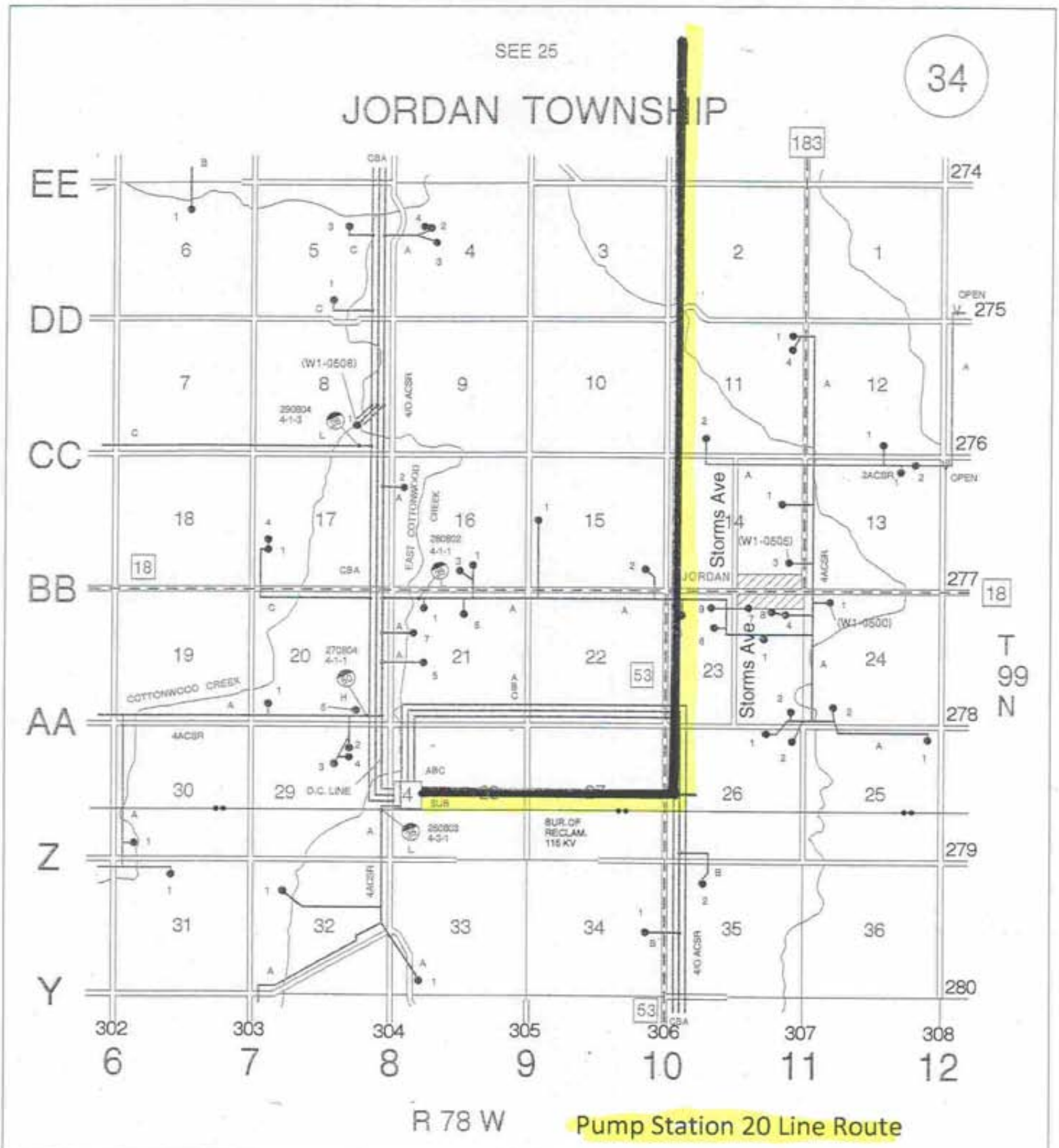
Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile



Pump Station 21 Line Route

Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile

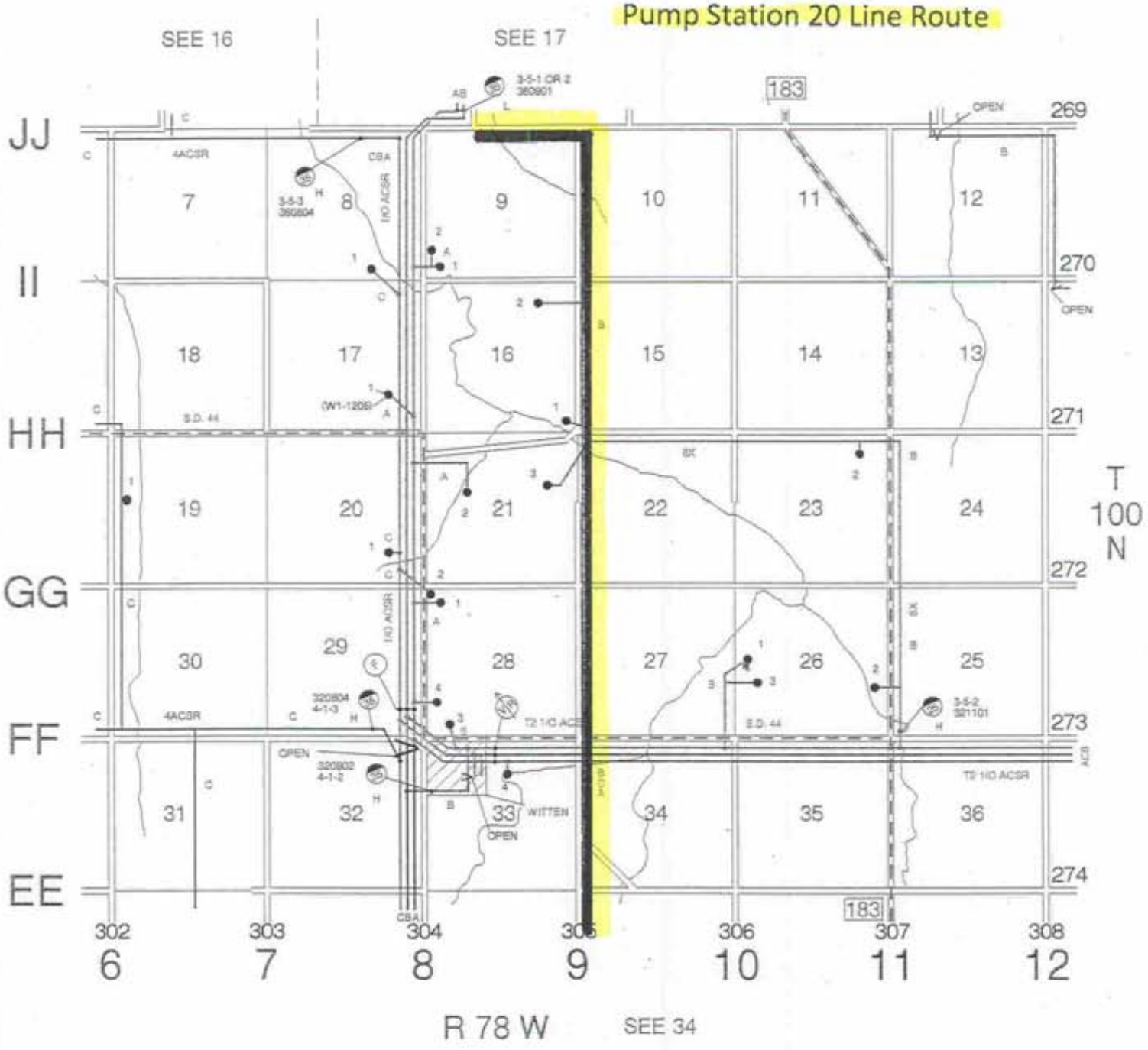
Pump Station 20 Line Route



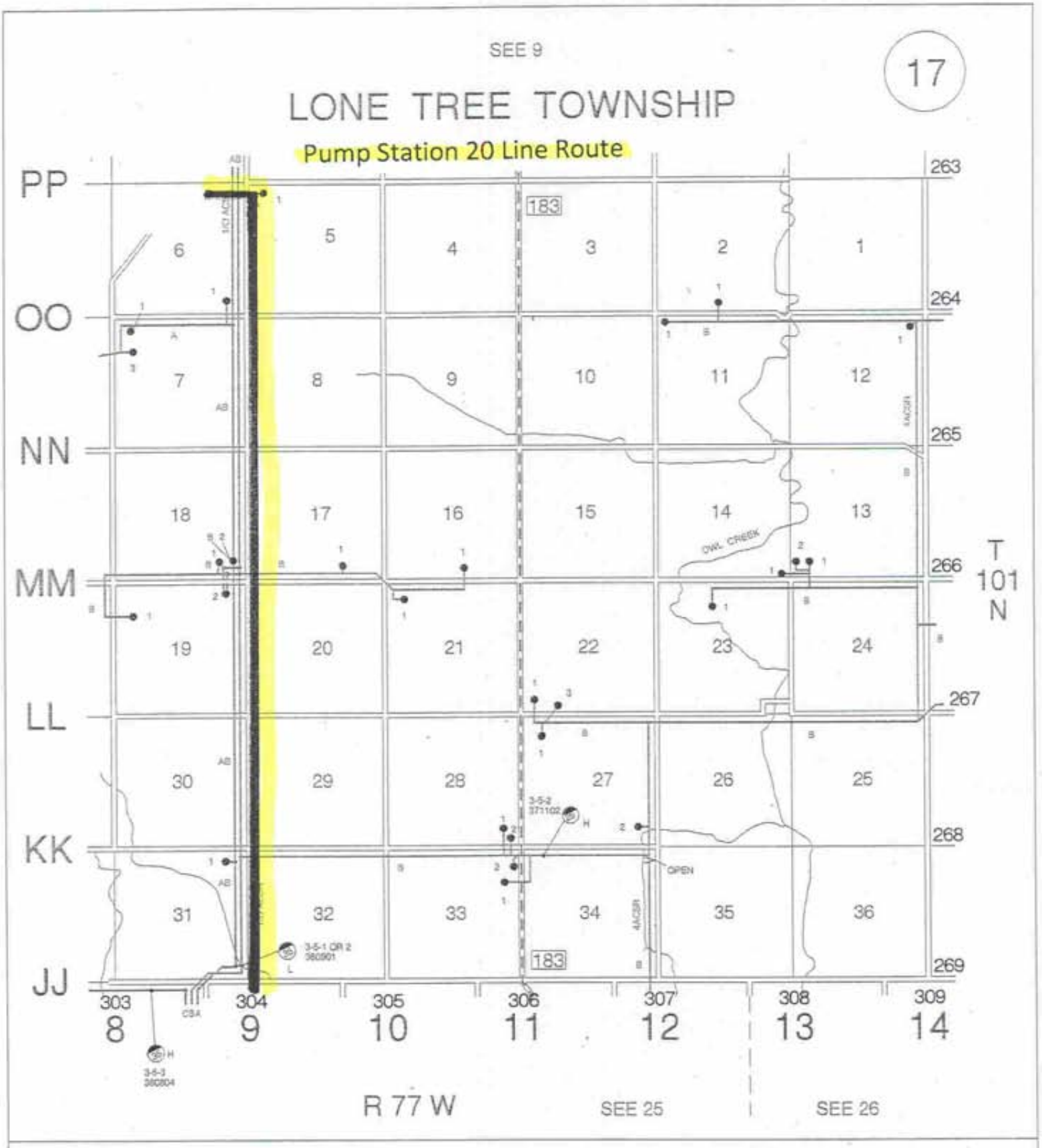
Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile

WITTEN TOWNSHIP

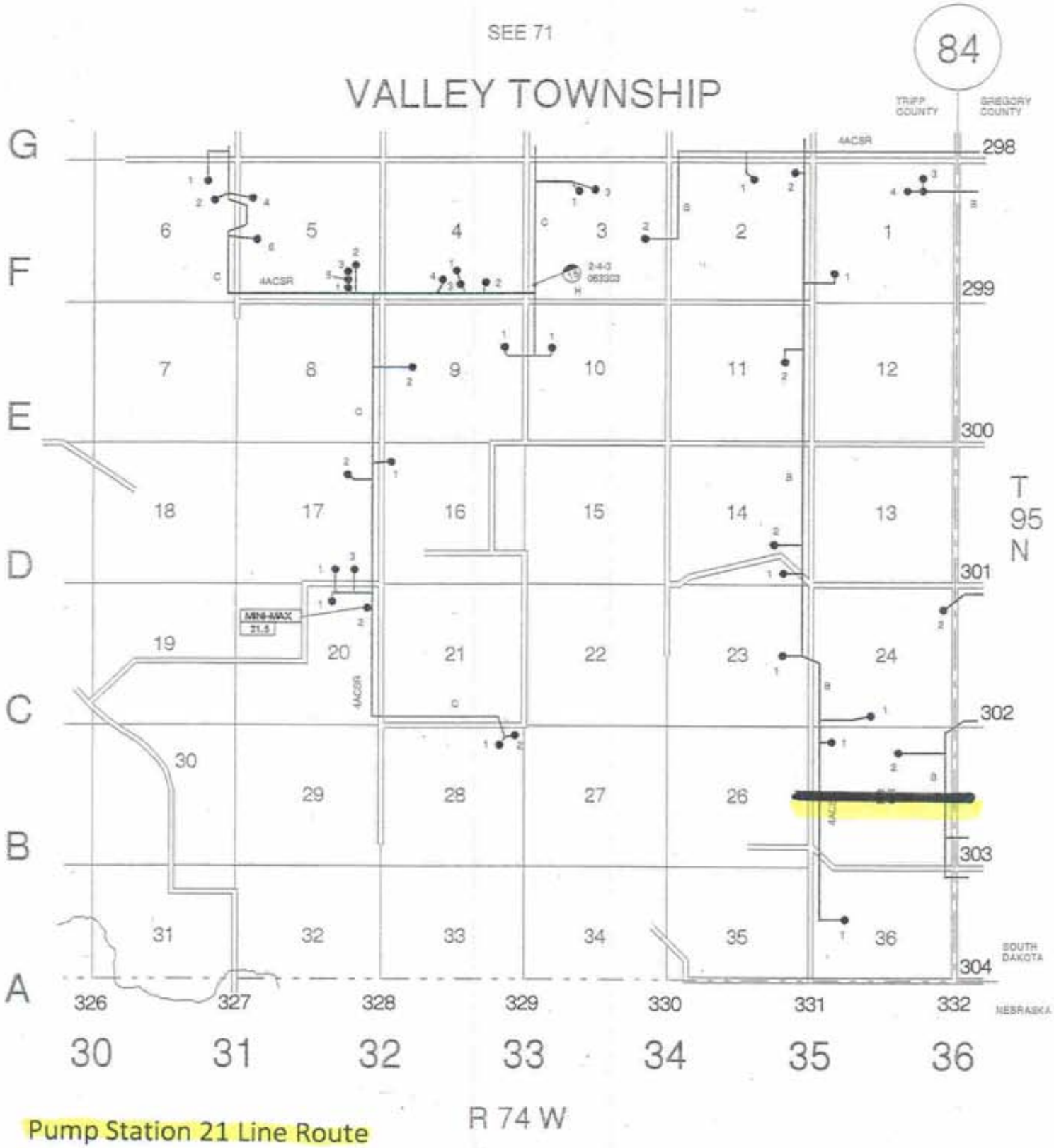
25



Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile



Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile



Pump Station 21 Line Route

Rosebud Electric Cooperative Gregory, SD 1 Inch = 1 Mile

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

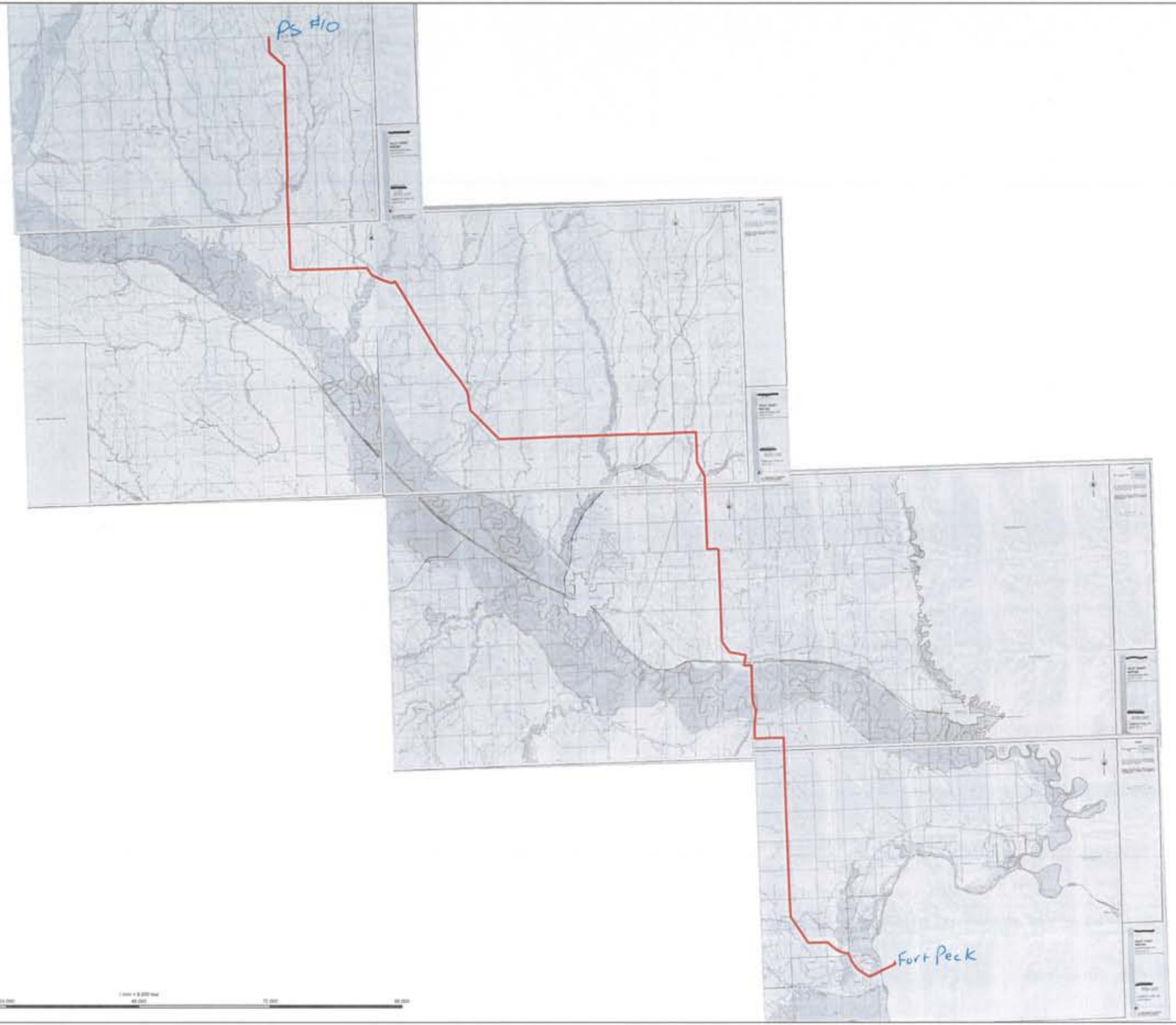
Point of Interconnection:

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.



WATER & ENVIRONMENTAL TECHNOLOGIES, PC

FEMA

FIGURE

-This page intentionally left blank-

"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

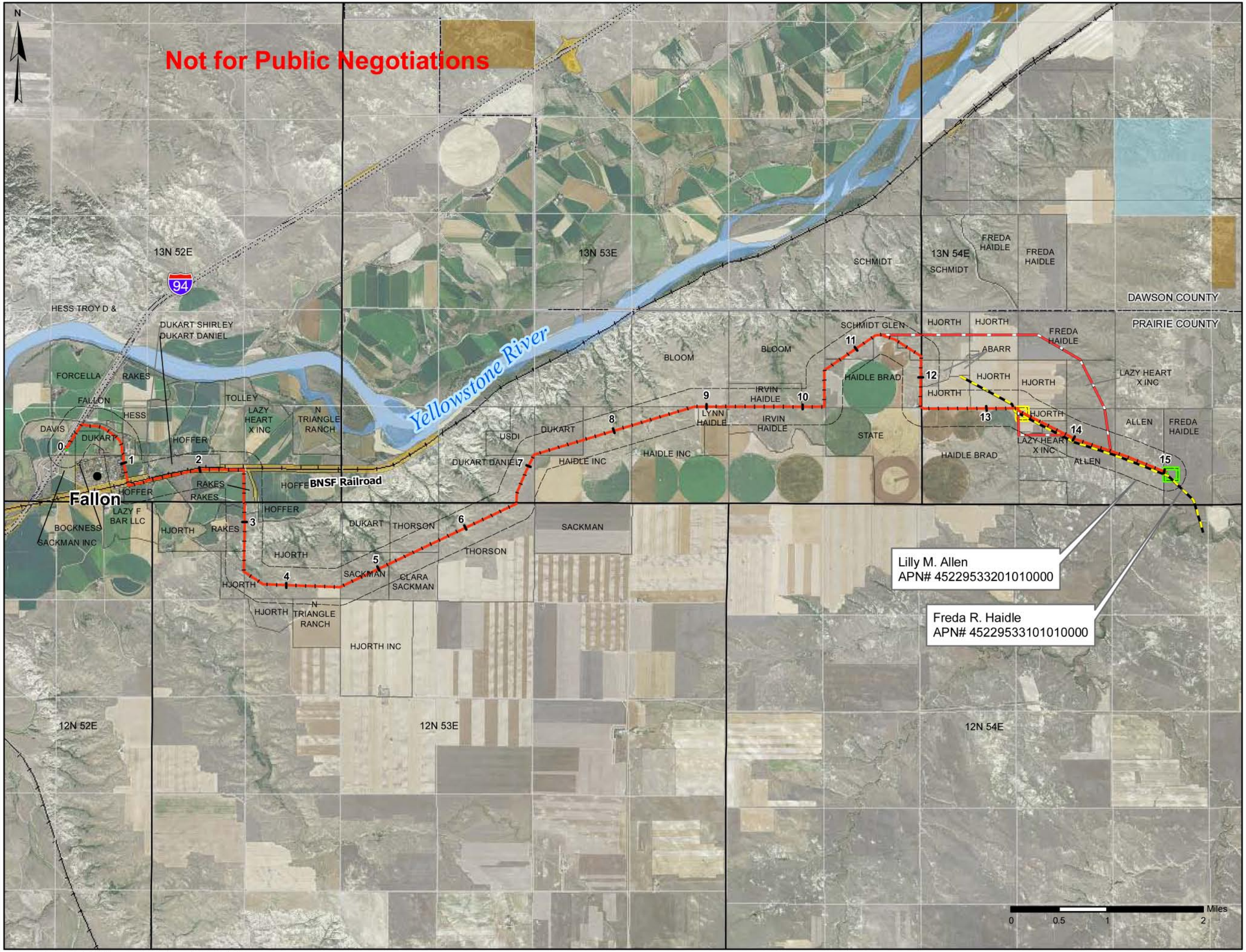
CORPORATE OFFICE:
3521 GABEL ROAD
BILLINGS, MT 59102
PHONE: 406-259-9933
FAX: 406-259-1164
EMAIL: contact-us@eciBillings.com

SALT LAKE CITY OFFICE:
660 WEST 700 SOUTH
WOODS CROSS, UT 84087
PHONE: 801-292-9954
FAX: 801-292-9177
EMAIL: contact-us@ecislc.com

TUCSON OFFICE
8740 NORTH ORACLE RD, #100
TUCSON, AZ 85704
PHONE: 520-219-0949
FAX: 520-219-0949
EMAIL: contact-us@eciTuc.com

MADISON OFFICE:
2800 ROYAL AVENUE #300
MONONA, WI 53713
PHONE: 608-240-0933
FAX: 608-240-1570
EMAIL: contact-us@eciMadison.com

-This page intentionally left blank-



PRELIMINARY 09-16-09

Tongue River
Electric Cooperative

Keystone Pipeline Project
115 kV Transmission Line
New PS-13 Location

ECI ELECTRICAL CONSULTANTS, INC.

- Proposed PS-13 New Location
- Proposed PS-13 Previous Location
- Preferred Route
- Alternate Routes
- TransCanada_Fallon Pipeline_042810
- 1000 ft. Project Buffer
- Railroad
- County Boundary

Ownership

- Private
- Right of Way
- State Government
- Bureau of Land Management
- Water

File: R:\Projects\M33-008_Keystone\GIS\MXD\TongueRiver_060810_NoROE.mxd, Jun 08, 2010 9:39:30 AM

-This page intentionally left blank-

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

A Powerful Friend to:

Alfalfa Electric Cooperative - Altus Air Force Base - Caddo Electric Cooperative - Canadian Valley Electric Cooperative - Choctaw Electric Cooperative - Cimarron Electric Cooperative
Cotton Electric Cooperative - East Central Oklahoma Electric Cooperative - Harmon Electric Association - Kay Electric Cooperative - Kiamichi Electric Cooperative
Kiwash Electric Cooperative - Northfork Electric Cooperative - Northwestern Electric Cooperative - Oklahoma Electric Cooperative - People's Electric Cooperative
Red River Valley Rural Electric Association - Rural Electric Cooperative - Southeastern Electric Cooperative - Southwest Rural Electric Association

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.

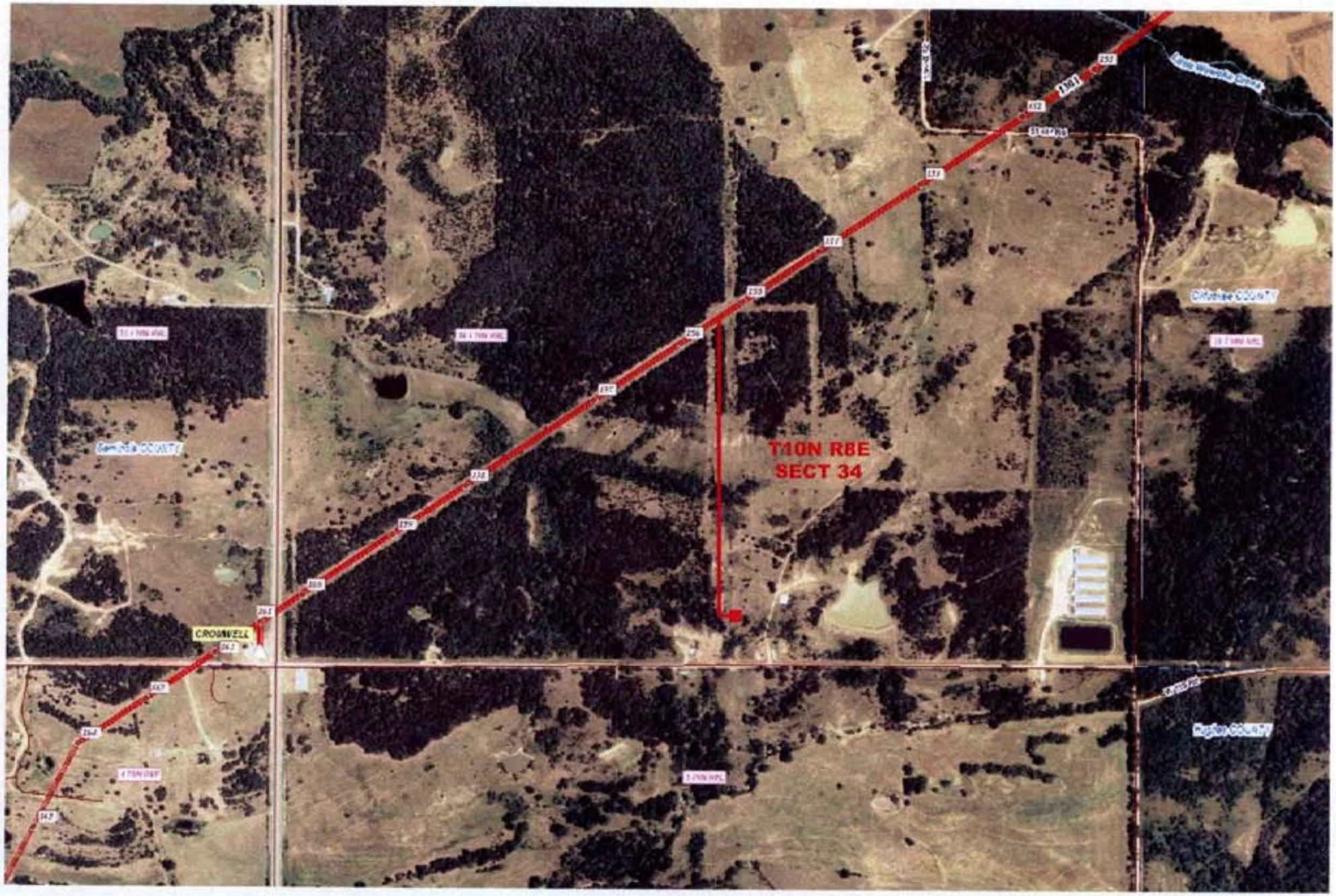
Sincerely,

Kent Fletcher

Kent Fletcher
Environmental Specialist

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

Attachments:
Vegetative Cover Map



TransCanada
Canadian Valley
PS-33

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.

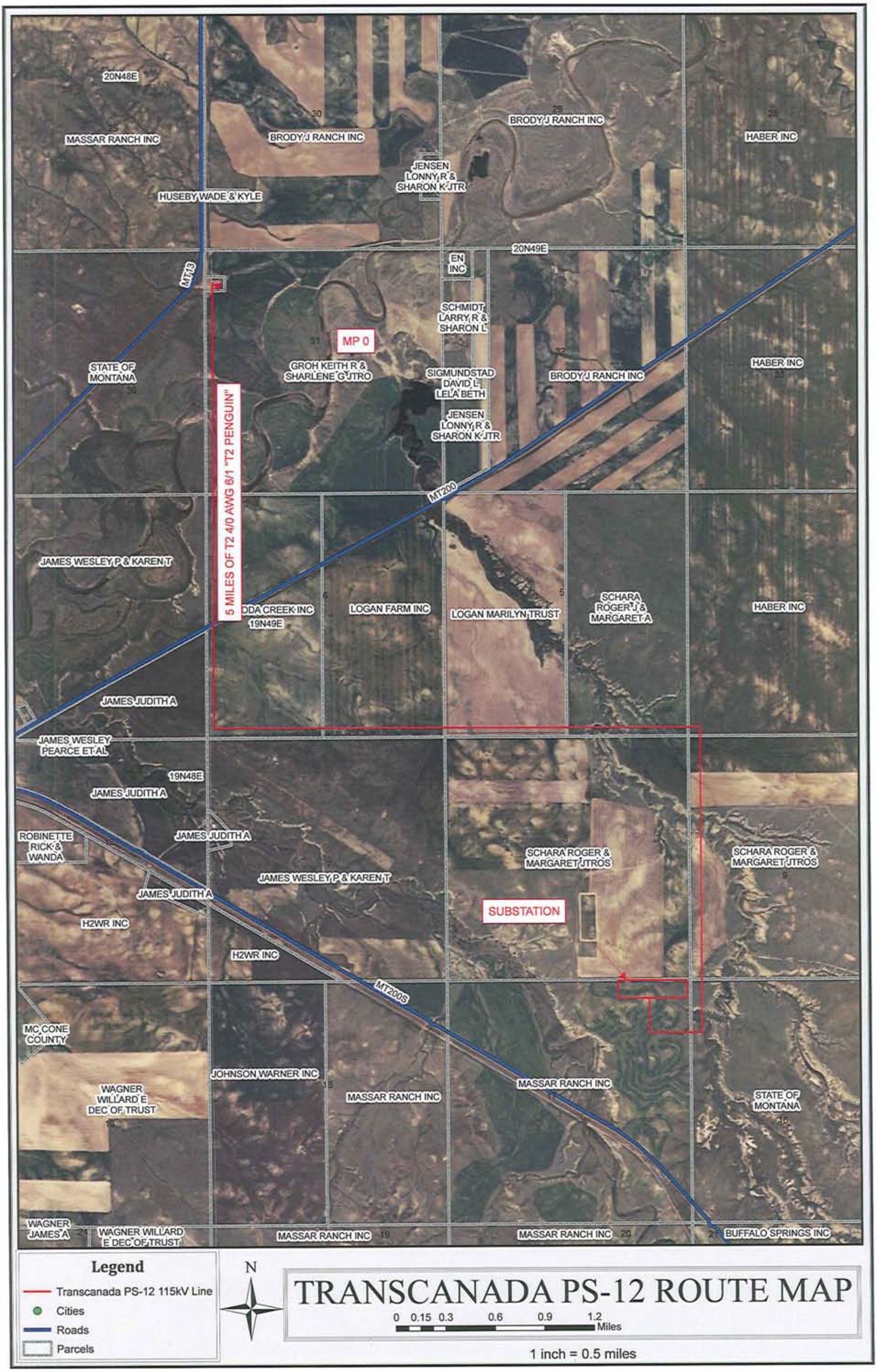
Enclosed is a map showing the proposed location of the power line we intend to permit and build to service the Keystone XL Project. We would appreciate your comments on where the mitigative measures need to be incorporated and what measures are specifically warranted.

Best regards,
McCone Electric Co-op., Inc.

Mike C. Kays
General Manager

Enclosure: PS#12 Final Transmission Route Map

-This page intentionally left blank-


20N48E
MASSAR RANCH INC
BRODY J RANCH INC
BRODY J RANCH INC
HABER INC
JENSEN LONNY R & SHARON K JTR
HUSEBY WADE & KYLE
20N49E
MT13
EN INC
SCHMIDT LARRY R & SHARON L
MP 0
STATE OF MONTANA
GROH KEITH R & SHARLENE G JTRO
SIGMUNDSTAD DAVID L LELA BETH
BRODY J RANCH INC
HABER INC
JENSEN LONNY R & SHARON K JTR
5 MILES OF T2 4/0 AWG 6/1 "T2 PENGUIN"
MT200
JAMES WESLEY P & KAREN T
ODA CREEK INC
19N49E
LOGAN FARM INC
LOGAN MARILYN TRUST
SCHARA ROGER J & MARGARET A
HABER INC
JAMES JUDITH A
JAMES WESLEY PEARCE ET AL
19N48E
JAMES JUDITH A
ROBINETTE RICK & WANDA
JAMES JUDITH A
SCHARA ROGER & MARGARET JTROS
SCHARA ROGER & MARGARET JTROS
JAMES WESLEY P & KAREN T
JAMES JUDITH A
SUBSTATION
H2WR INC
H2WR INC
MT200S
MC CONE COUNTY
JOHNSON WARNER INC
WAGNER WILLARD E DEC OF TRUST
MASSAR RANCH INC
MASSAR RANCH INC
STATE OF MONTANA
WAGNER JAMES A
WAGNER WILLARD E DEC OF TRUST
MASSAR RANCH INC
MASSAR RANCH INC
BUFFALO SPRINGS INC
Legend
Transcanada PS-12 115kV Line
Cities
Roads
Parcels
N
TRANSCANADA PS-12 ROUTE MAP
0 0.15 0.3 0.6 0.9 1.2
Miles
1 inch = 0.5 miles

-This page intentionally left blank-

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.

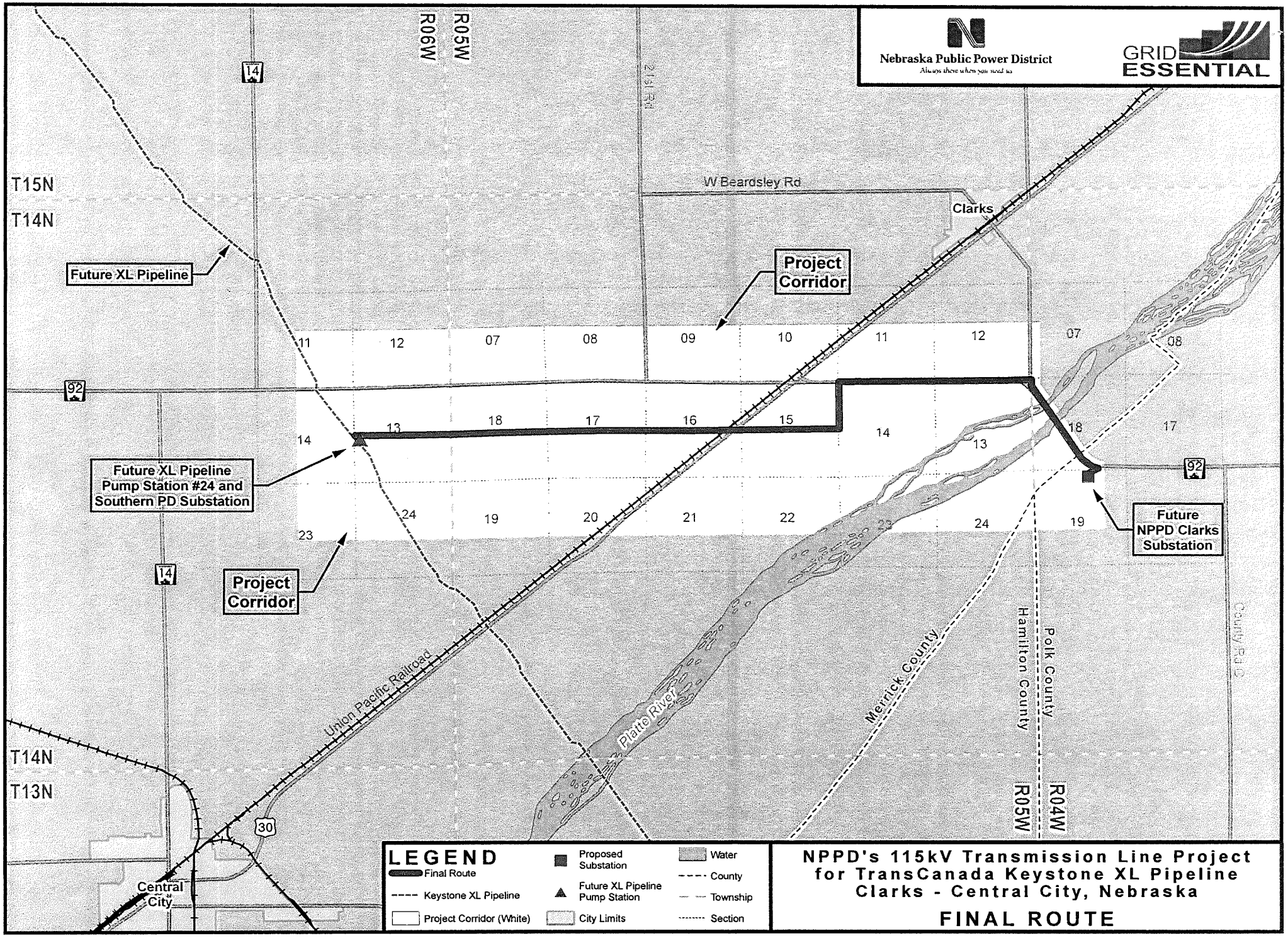
Please contact me at 402-563-5355 if you have any questions or require additional information.

Sincerely,

Joe L. Citta, Jr.
Environmental Manager

Attachments

Cc: Robert Harms (USFWS)
Michelle Koch (NGPC)
Larry Sibbald (TransCanada)
Don Veseth (NPPD)


Nebraska Public Power District
Always there when you need us
GRID ESSENTIAL
T15N
T14N
T13N
R06W
R05W
R04W
W Beardsley Rd
Clarks
Future XL Pipeline
Project Corridor
Future XL Pipeline Pump Station #24 and Southern PD Substation
Project Corridor
Future NPPD Clarks Substation
Union Pacific Railroad
Platte River
Merrick County
Hamilton County
Polk County
County Rd G
Central City
14
92
30
LEGEND
Final Route
Keystone XL Pipeline
Project Corridor (White)
Proposed Substation
Future XL Pipeline Pump Station
City Limits
Water
County
Township
Section
NPPD's 115kV Transmission Line Project
for TransCanada Keystone XL Pipeline
Clarks - Central City, Nebraska
FINAL ROUTE

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.

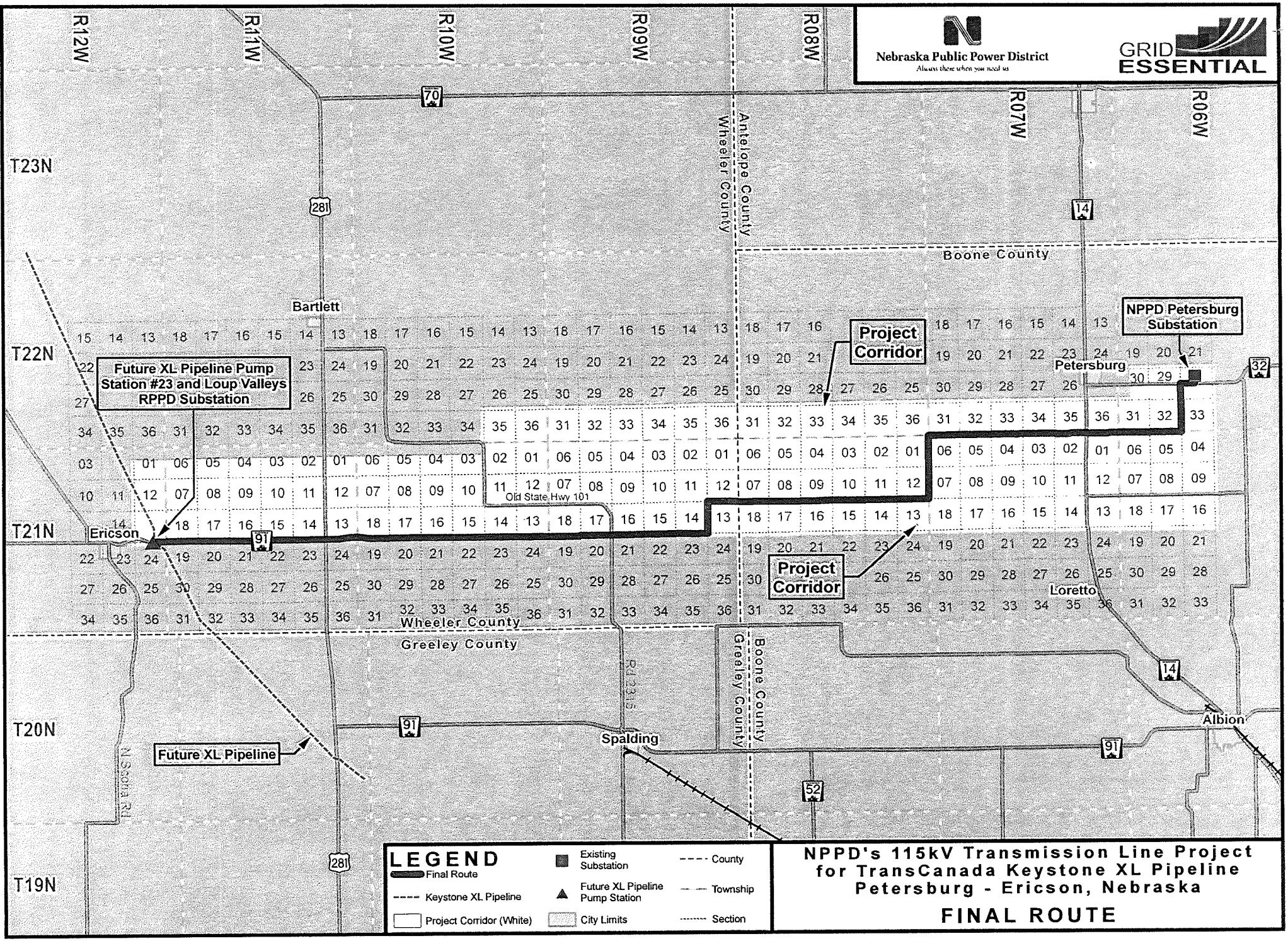
Thank you for the opportunity to comment. If you have any questions or need additional information, please feel free to contact me.

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


Nebraska Public Power District
Always there when you need us
GRID ESSENTIAL
R12W
R11W
R10W
R09W
R08W
R07W
R06W
T23N
T22N
T21N
T20N
T19N
Antelope County
Wheeler County
Boone County
Greeley County
Bartlett
Ericson
Spalding
Petersburg
Loretto
Albion
Old State Hwy 101
Rd 331
N Scotia Rd
Future XL Pipeline Pump Station #23 and Loup Valleys RPPD Substation
Project Corridor
NPPD Petersburg Substation
Future XL Pipeline
LEGEND
Final Route
Keystone XL Pipeline
Project Corridor (White)
Existing Substation
Future XL Pipeline Pump Station
City Limits
County
Township
Section
NPPD's 115kV Transmission Line Project
for TransCanada Keystone XL Pipeline
Petersburg - Ericson, Nebraska
FINAL ROUTE

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

Nebraska Public Power District
Always there when you need us

GRID ESSENTIAL

R16W R15W R14W R13W R12W R11W

T30N T29N T28N

Stuart

Atkinson

Holt County

877th Rd

Emmet

O'Neill

870th Rd

869th Rd

Future XL Pipeline

Project Corridor

Future XL Pipeline Pump Station #22 and Niobrara Valley EMC Substation

NPPD O'Neill Substation

Project Corridor

O'NEILL ENLARGEMENT

NPPD O'Neill Substation

LEGEND

Final Route

Keystone XL Pipeline

Project Corridor (White)

Existing Substation

Future XL Pipeline Pump Station

City Limits

County

Township

Section

NPPD's 115kV Transmission Line Project for TransCanada Keystone XL Pipeline O'Neill - Stuart, Nebraska

FINAL ROUTE

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

MICHAEL FLOERSCH, Chairman
GARY GRIFFITHS, Commissioner
DONALD BUTTON, Commissioner
BILL CALLAWAY, Superintendent

427 Court Street
P.O. Box 117
Clay Center, Kansas 67432
(785) 632-2137
Fax (785) 632-6317
Email: bcpuc@nckcn.com

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
FAX: 406-259-3441

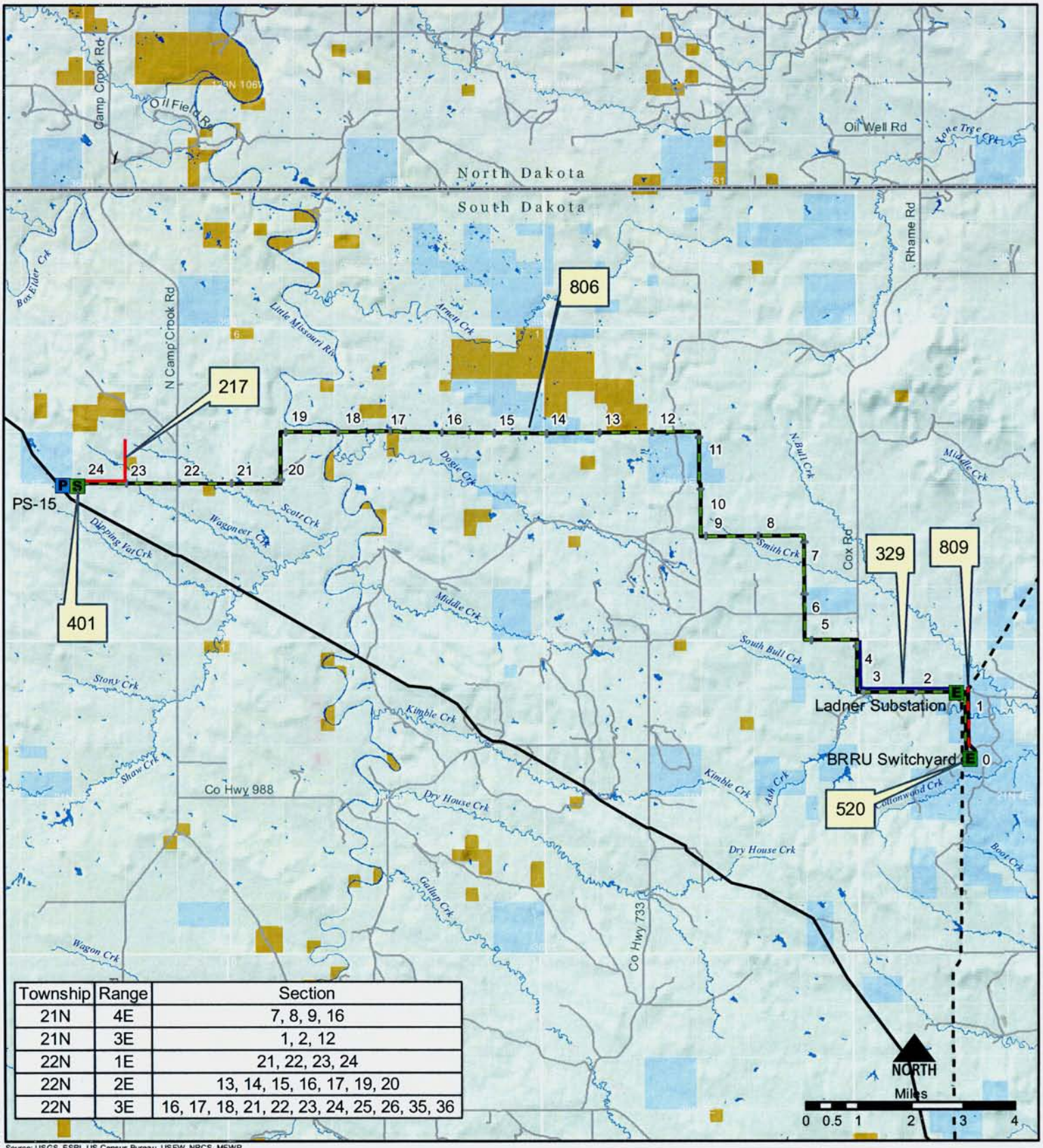
SALT LAKE CITY OFFICE:
1410 SOUTH 600 WEST
WOODS CROSS, UT 84087
PHONE: 801-292-9954
FAX: 801-292-9177

TUCSON OFFICE:
7493 N. ORACLE RD, #203
TUCSON, AZ 85704
PHONE: 520-219-9933
FAX: 520-219-9949

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)**



Township	Range	Section
21N	4E	7, 8, 9, 16
21N	3E	1, 2, 12
22N	1E	21, 22, 23, 24
22N	2E	13, 14, 15, 16, 17, 19, 20
22N	3E	16, 17, 18, 21, 22, 23, 24, 25, 26, 35, 36

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

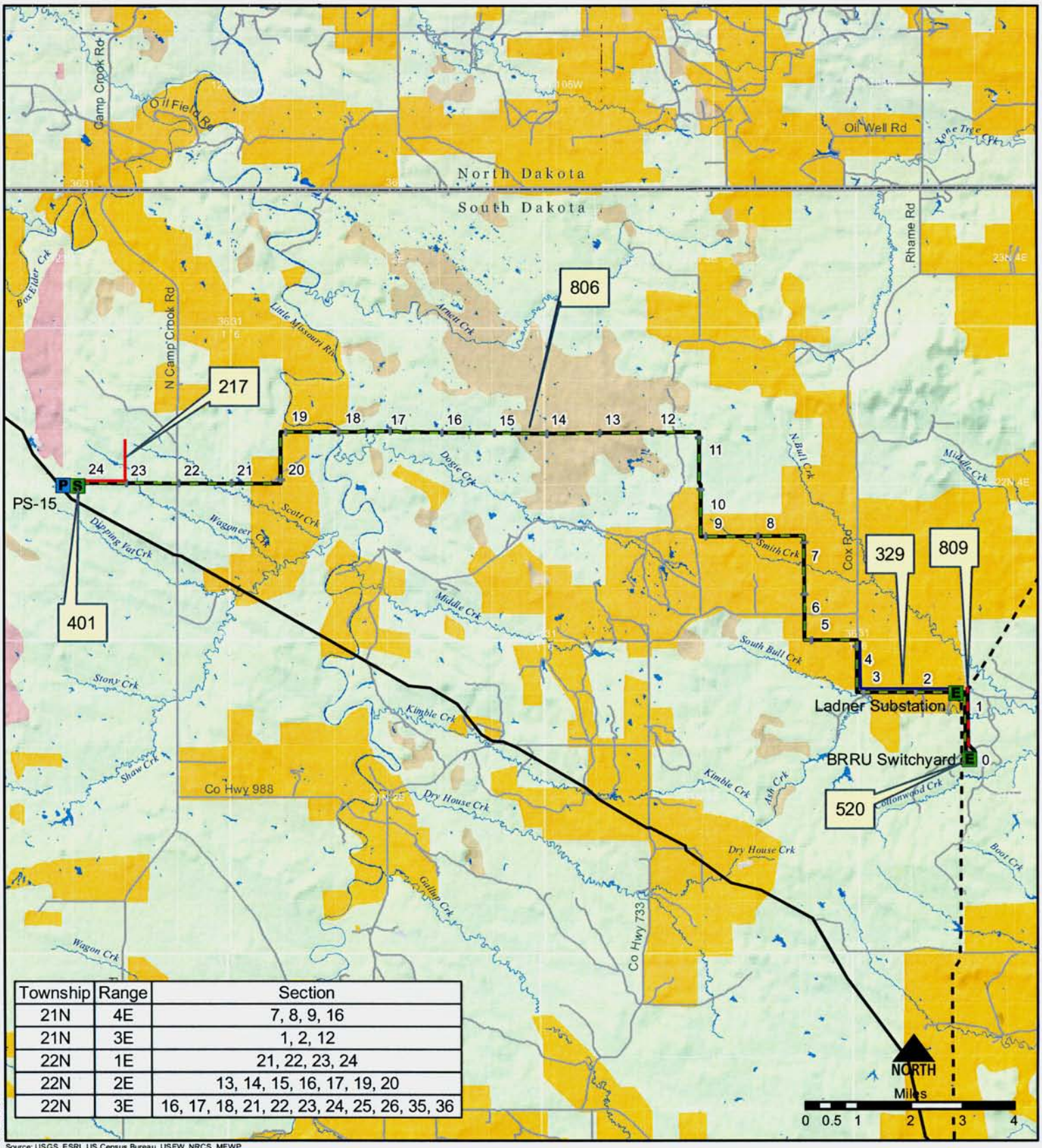
- P Pumping Station 15
- S Proposed Substation
- E Existing Substations
- New Transmission Line
- Rebuild Transmission Line
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- BLM
- State
- Private

PS 15
Service Area
Jurisdiction

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15.mxd 10/14/2010 10:14:19 AM



Township	Range	Section
21N	4E	7, 8, 9, 16
21N	3E	1, 2, 12
22N	1E	21, 22, 23, 24
22N	2E	13, 14, 15, 16, 17, 19, 20
22N	3E	16, 17, 18, 21, 22, 23, 24, 25, 26, 35, 36

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

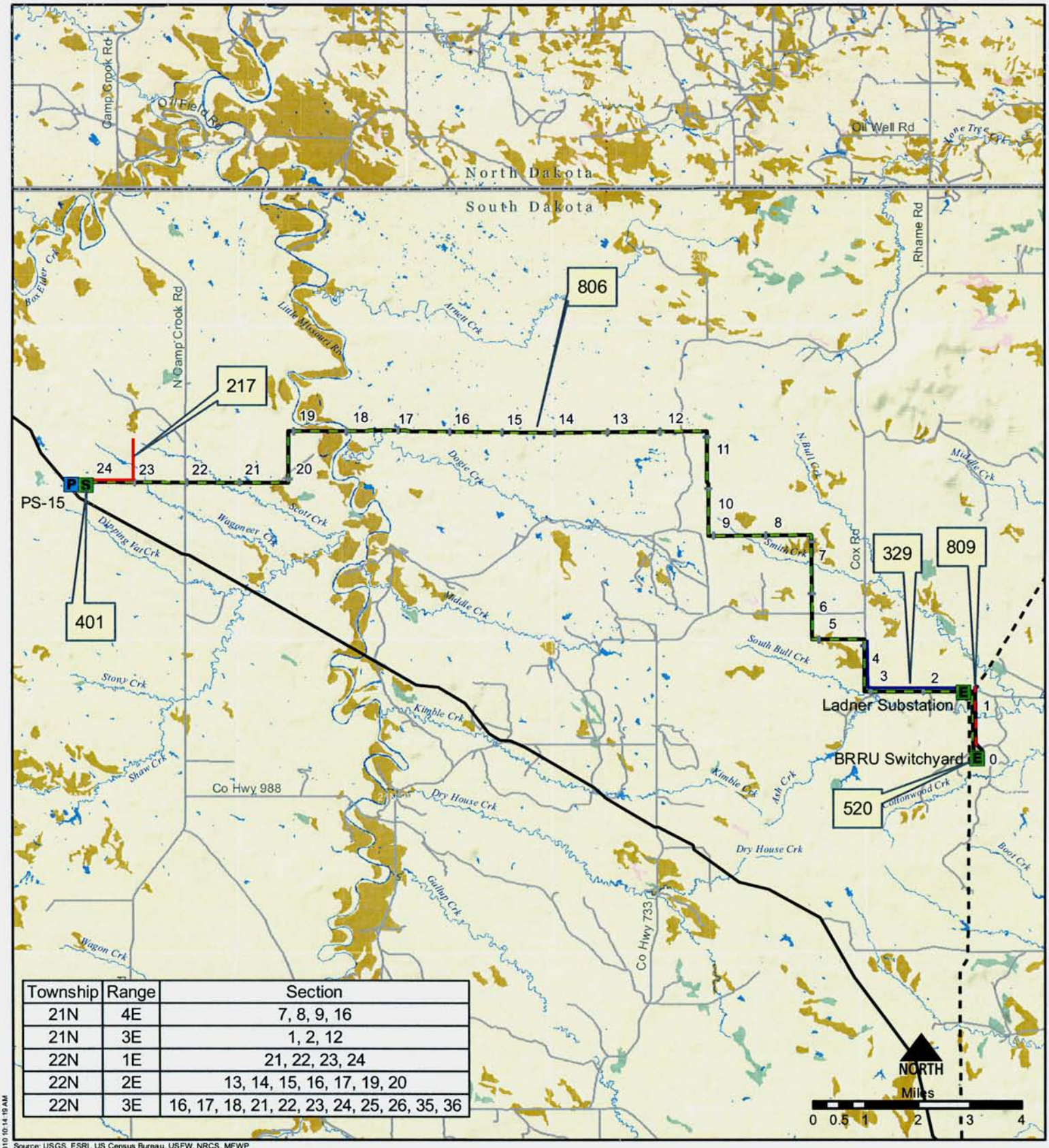
- Pumping Station 15
- Proposed Substation
- Existing Substations
- New Transmission Line
- Rebuild Transmission Line
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- Cropland and Pasture
- Herbaceous Rangeland
- Mixed Rangeland
- Sandy areas

PS 15
Service Area
Land Use

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-5601 Keystone\GIS\MXD\ER_PS15.mxd 10/14/2010 10:14:19 AM



Township	Range	Section
21N	4E	7, 8, 9, 16
21N	3E	1, 2, 12
22N	1E	21, 22, 23, 24
22N	2E	13, 14, 15, 16, 17, 19, 20
22N	3E	16, 17, 18, 21, 22, 23, 24, 25, 26, 35, 36

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

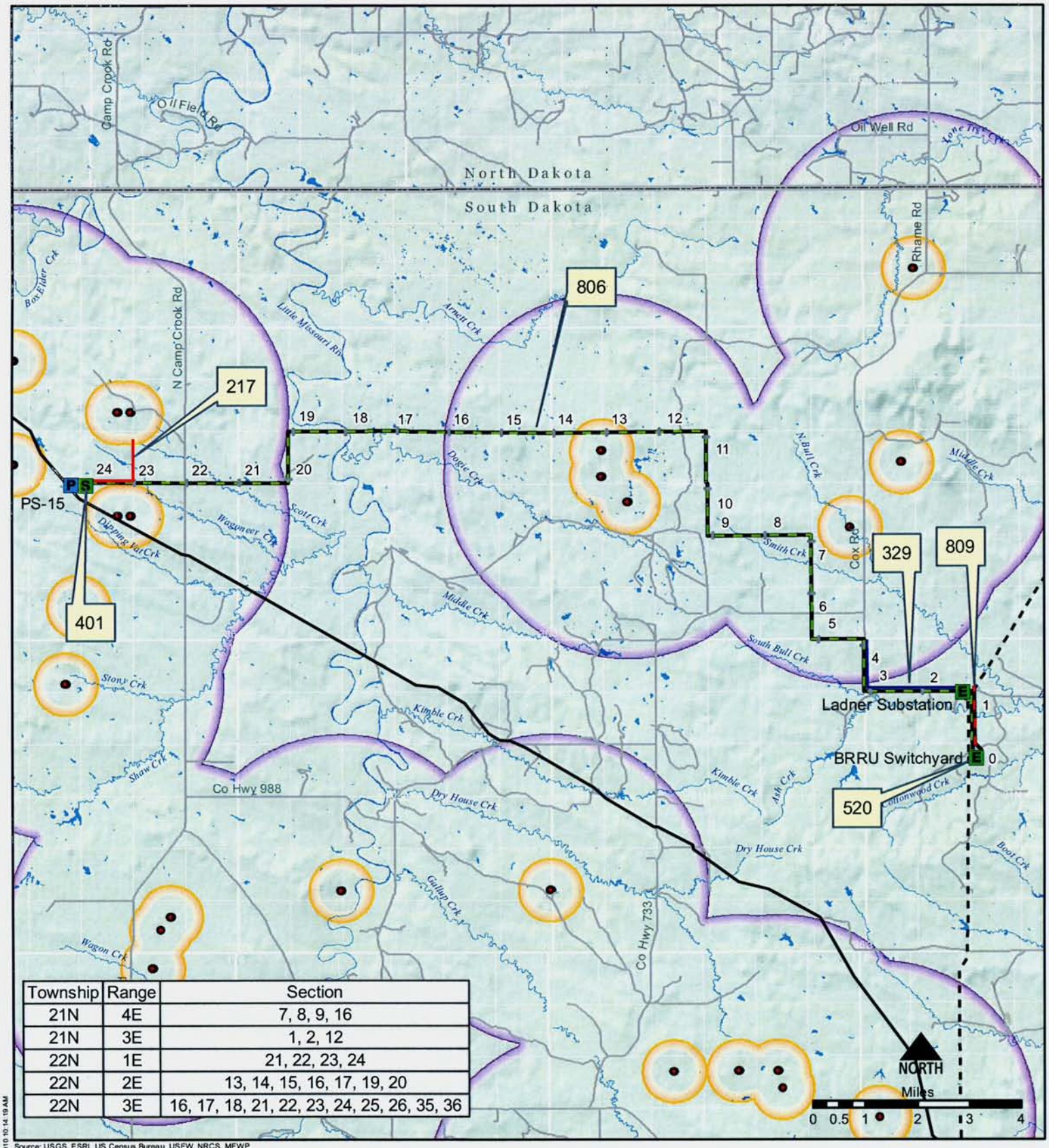
- Pumping Station 15
- Proposed Substation
- Existing Substations
- New Transmission Line
- Rebuild Transmission Line
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- All areas are prime farmland
- Farmland of statewide importance
- Non-prime farmland
- Prime farmland if irrigated

PS 15
Service Area
Prime Farmland

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS15.mxd 10/14/2010 10:14:19 AM



Township	Range	Section
21N	4E	7, 8, 9, 16
21N	3E	1, 2, 12
22N	1E	21, 22, 23, 24
22N	2E	13, 14, 15, 16, 17, 19, 20
22N	3E	16, 17, 18, 21, 22, 23, 24, 25, 26, 35, 36

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

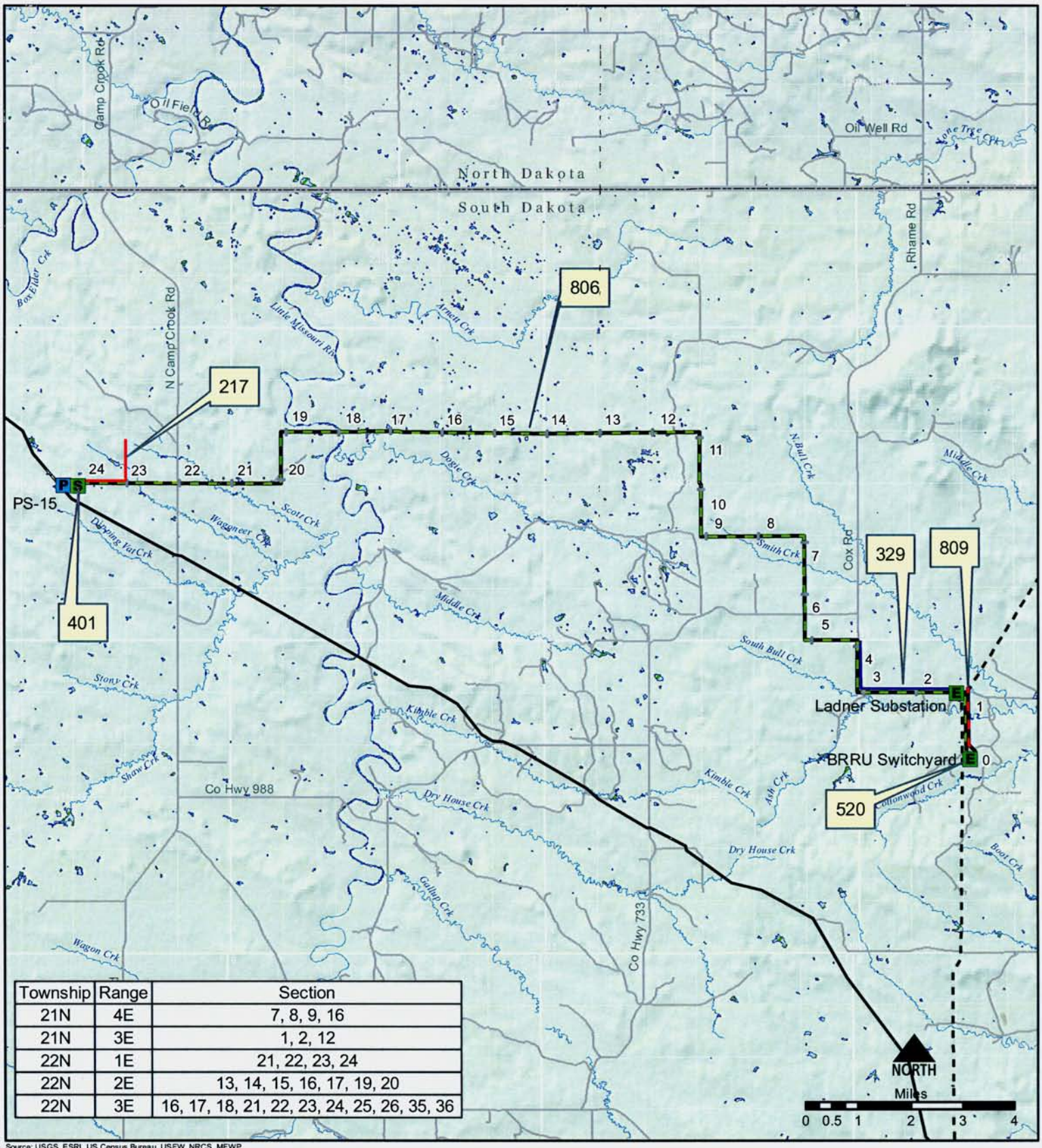
- Pumping Station 15
- Proposed Substation
- Existing Substations
- New Transmission Line
- Rebuild Transmission Line
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 15
Service Area
Sage Grouse

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS15.mxd 10/14/2010 10:14:19 AM



Township	Range	Section
21N	4E	7, 8, 9, 16
21N	3E	1, 2, 12
22N	1E	21, 22, 23, 24
22N	2E	13, 14, 15, 16, 17, 19, 20
22N	3E	16, 17, 18, 21, 22, 23, 24, 25, 26, 35, 36

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

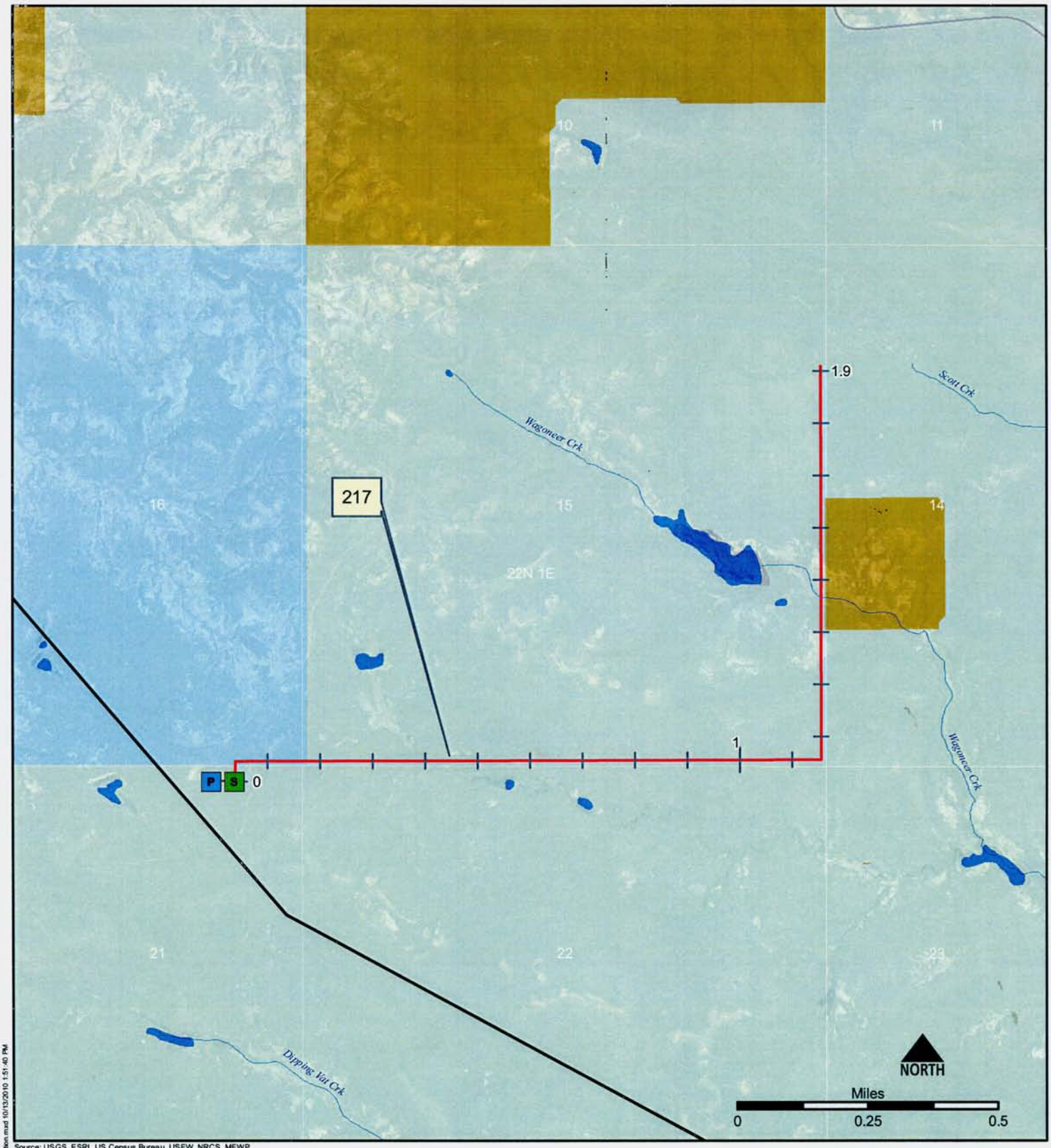
- Pumping Station 15
- Proposed Substation
- Existing Substations
- New Transmission Line
- Rebuild Transmission Line
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- Wetlands

PS 15
Service Area
Wetlands

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-5601 Keystone\GIS\MXD\ER_PS15.mxd 10/14/2010 10:14:19 AM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

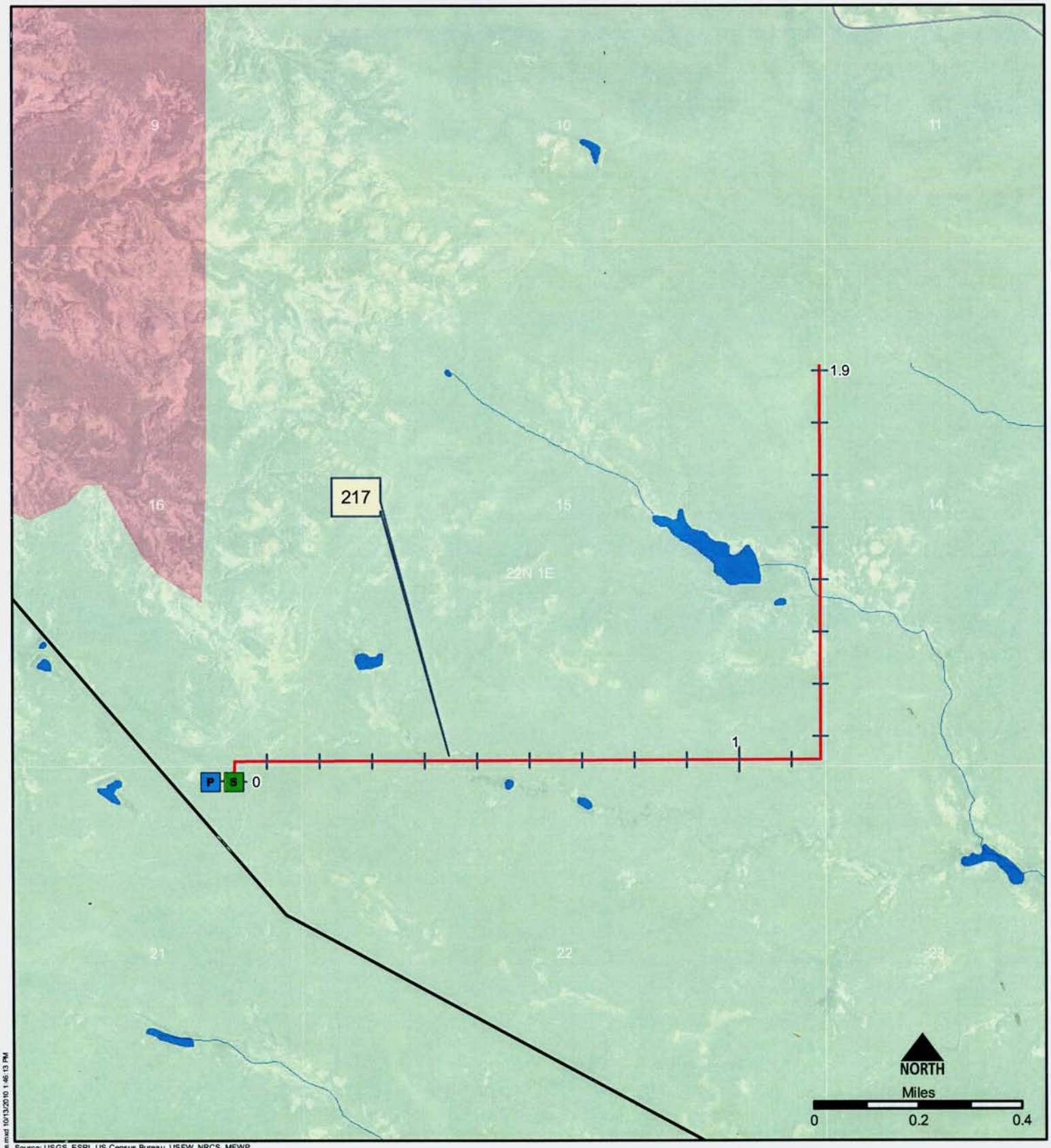
P Pumping Station-15
S Proposed Substation
New Distribution Line Construction
Proposed Keystone Pipeline
Roads
Streams
BLM
State
Private

PS 15
Service Area
Jurisdiction
Project 217

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC

File: R:\Projects\540-5601 Keystone\GIS\MXD\ER_PS15_217_Jurisdiction.mxd 10/13/2010 1:51:40 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

P Pumping Station-15

S Proposed Substation

New Distribution Line Construction

Proposed Keystone Pipeline

Roads

Streams

Herbaceous Rangeland

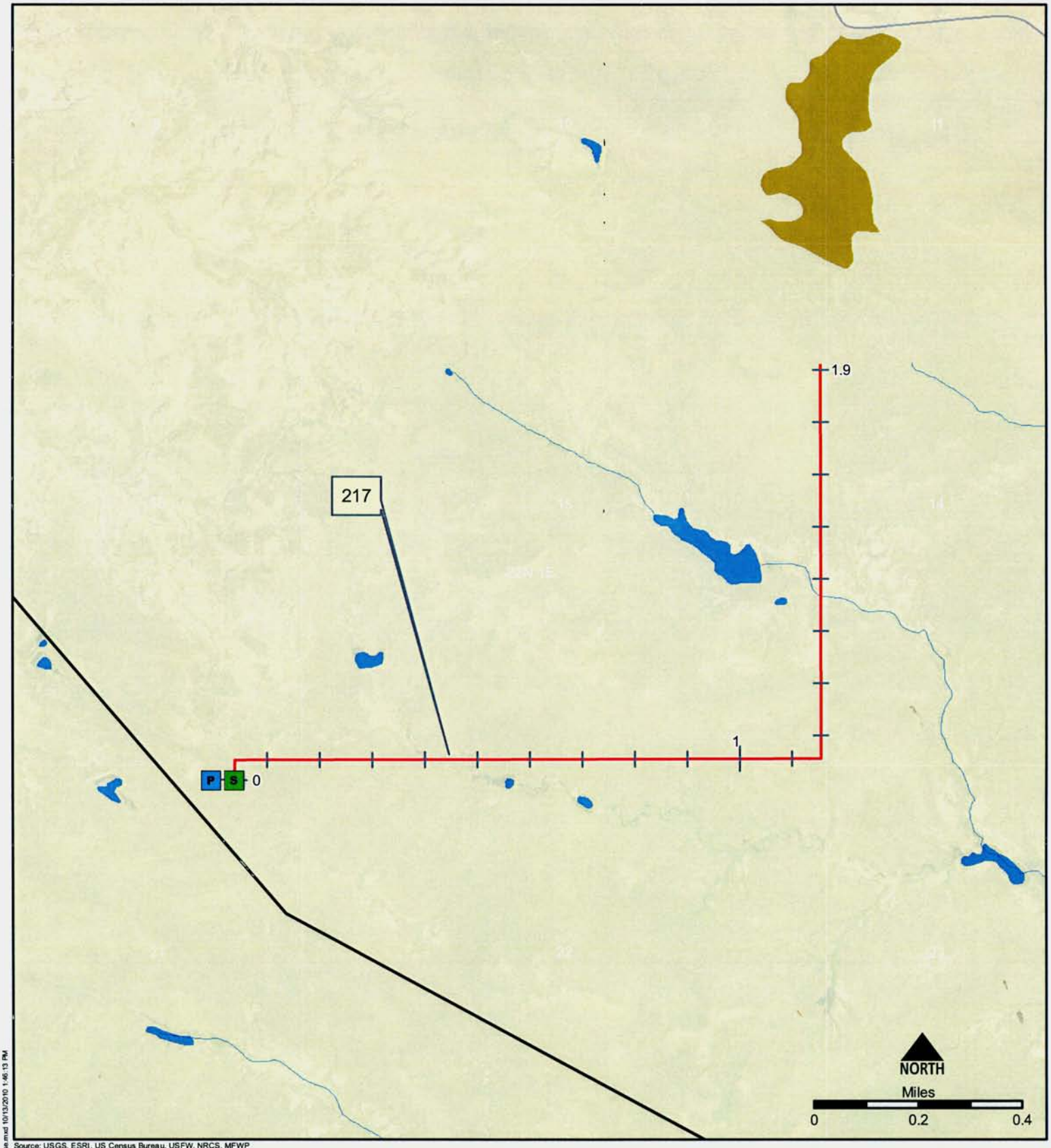
Mixed Rangeland

PS 15
Service Area
Land Use
Project 217

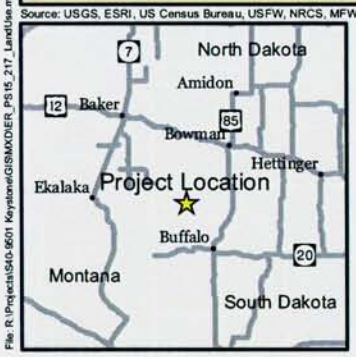
GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_217_LandUse.mxd 10/13/2010 1:46:13 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP



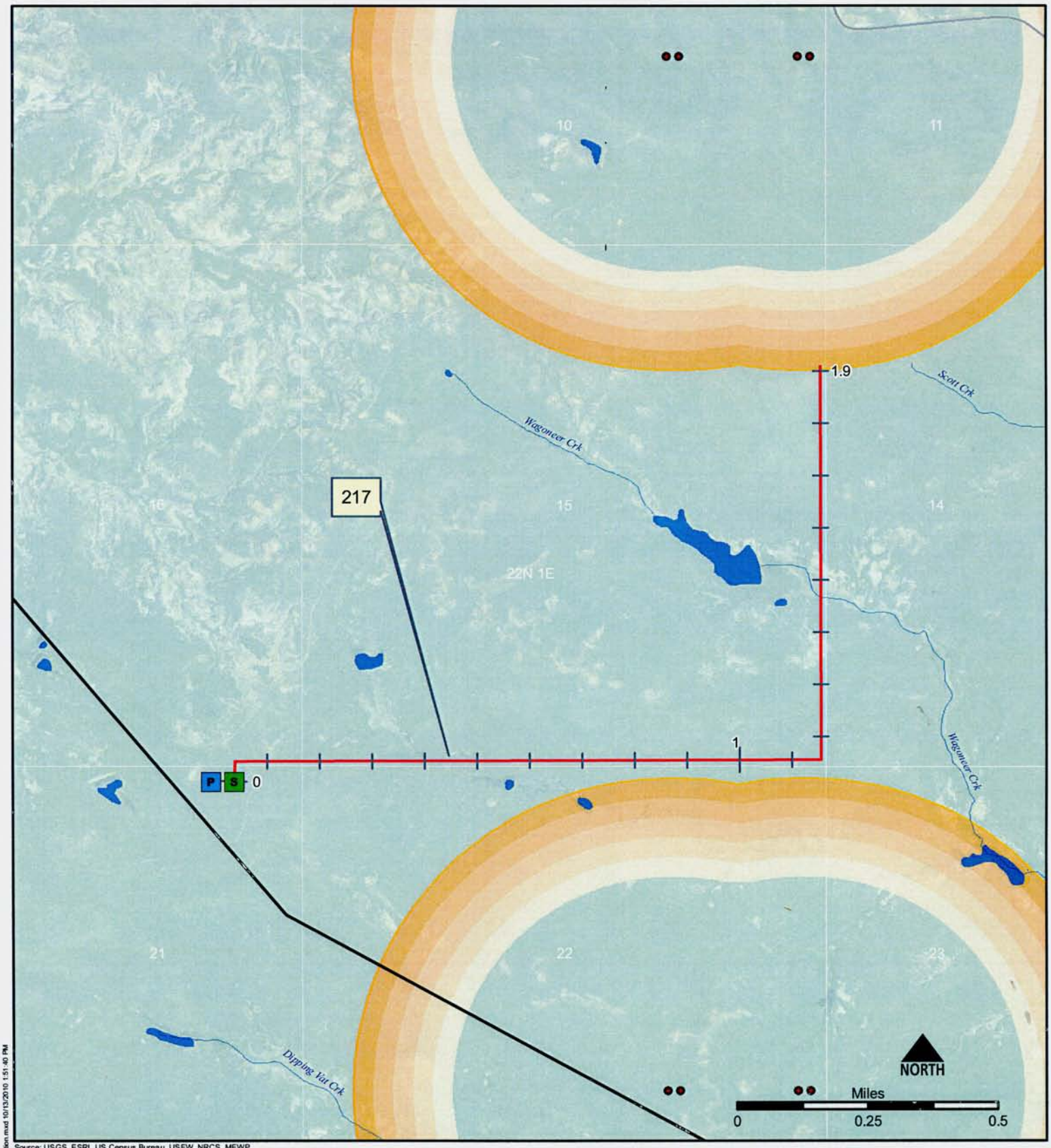
- Pumping Station-15
- Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- Farmland of statewide importance
- Non-prime farmland

PS 15
Service Area
Prime Farmland
Project 217

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_217_LandUse.mxd 10/13/2010 1:46:13 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

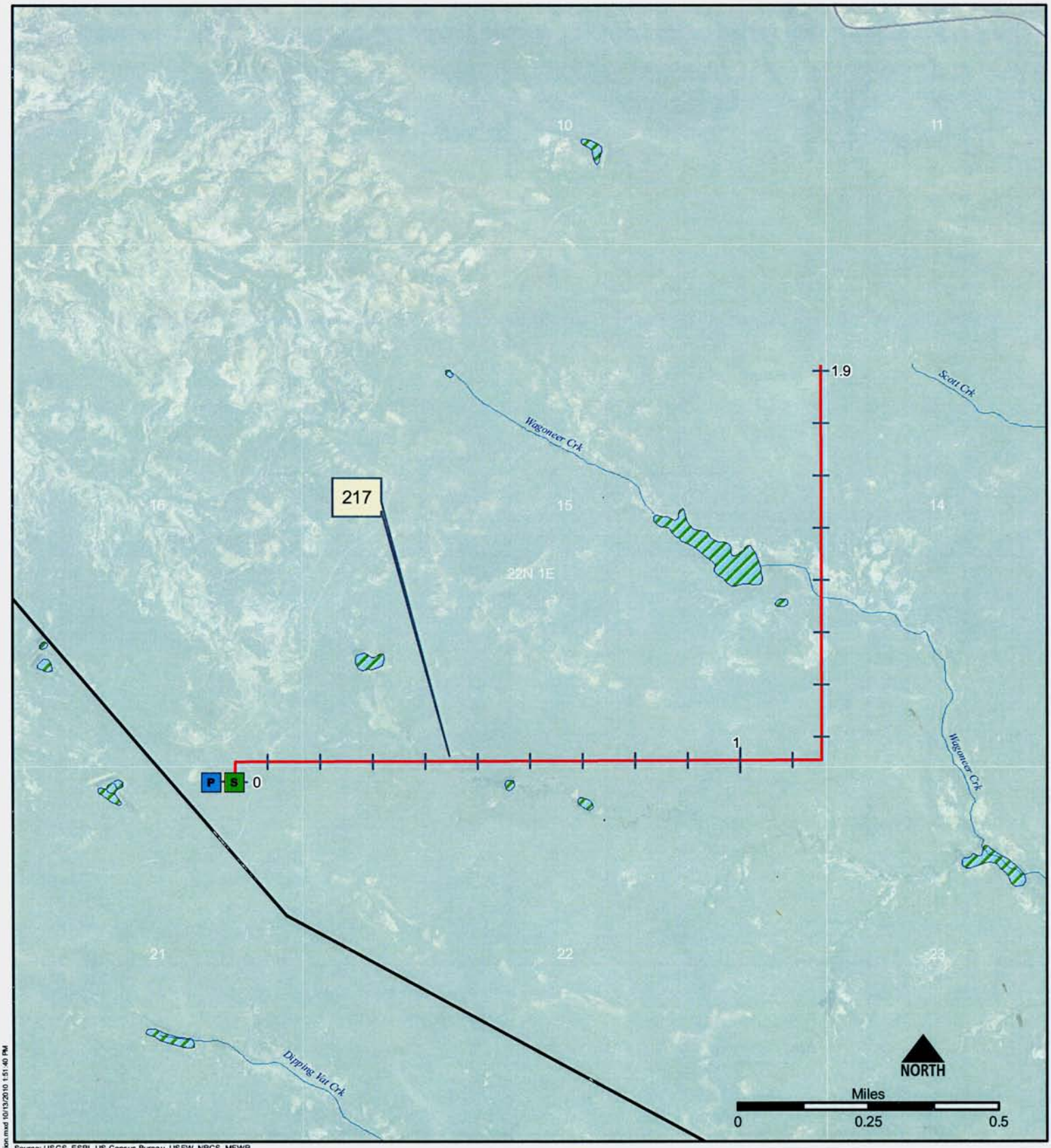
- Pumping Station-15
- Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 15
Service Area
Sage Grouse
Project 217

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_217_Jurisdiction.mxd 10/13/2010 1:51:40 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

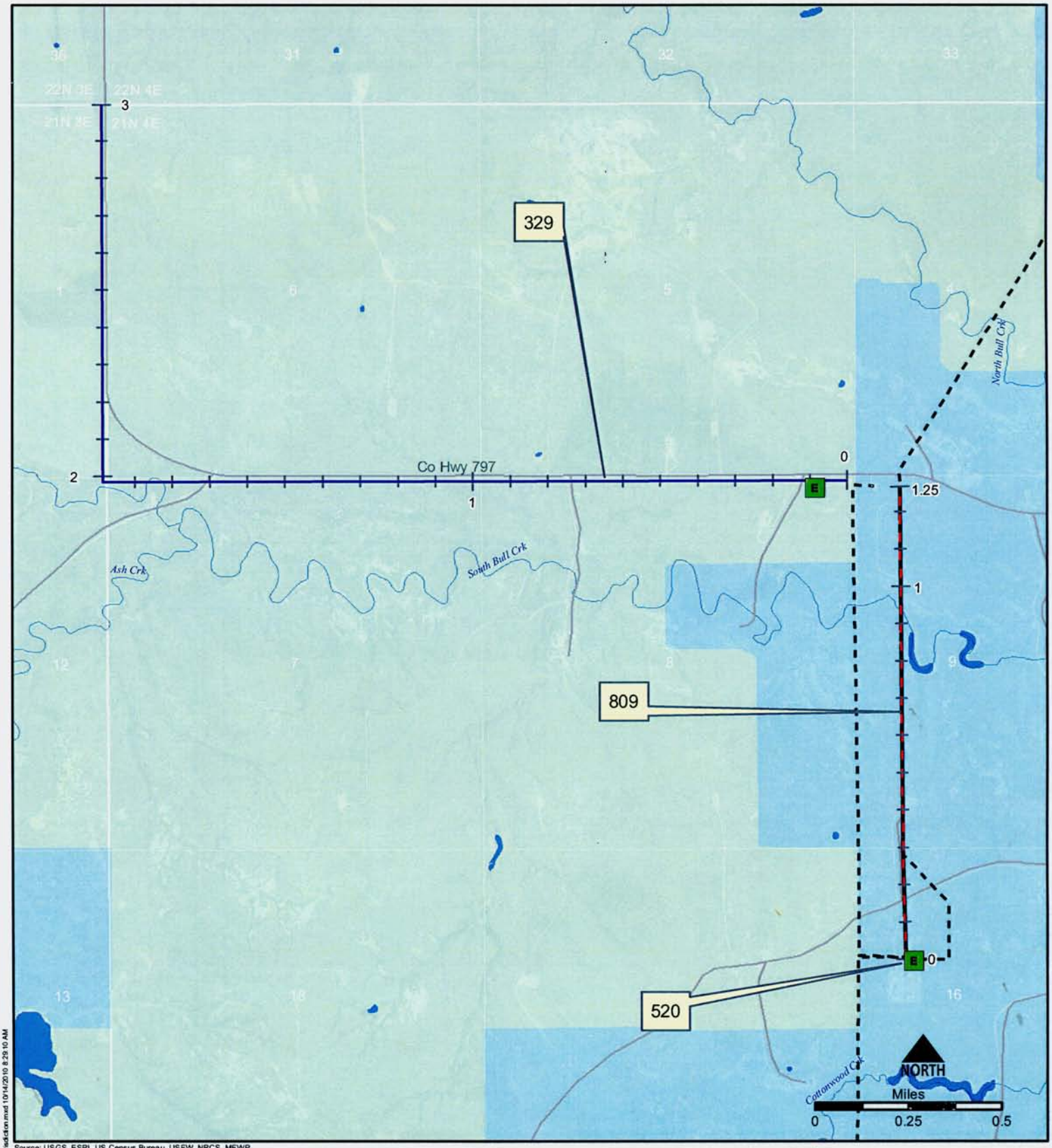
P Pumping Station-15
S Proposed Substation
New Distribution Line Construction
Proposed Keystone Pipeline
Roads
Streams
Wetlands

PS 15
Service Area
Wetlands
Project 217

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS15_217_Jurisdiction.mxd 10/13/2010 1:51:40 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

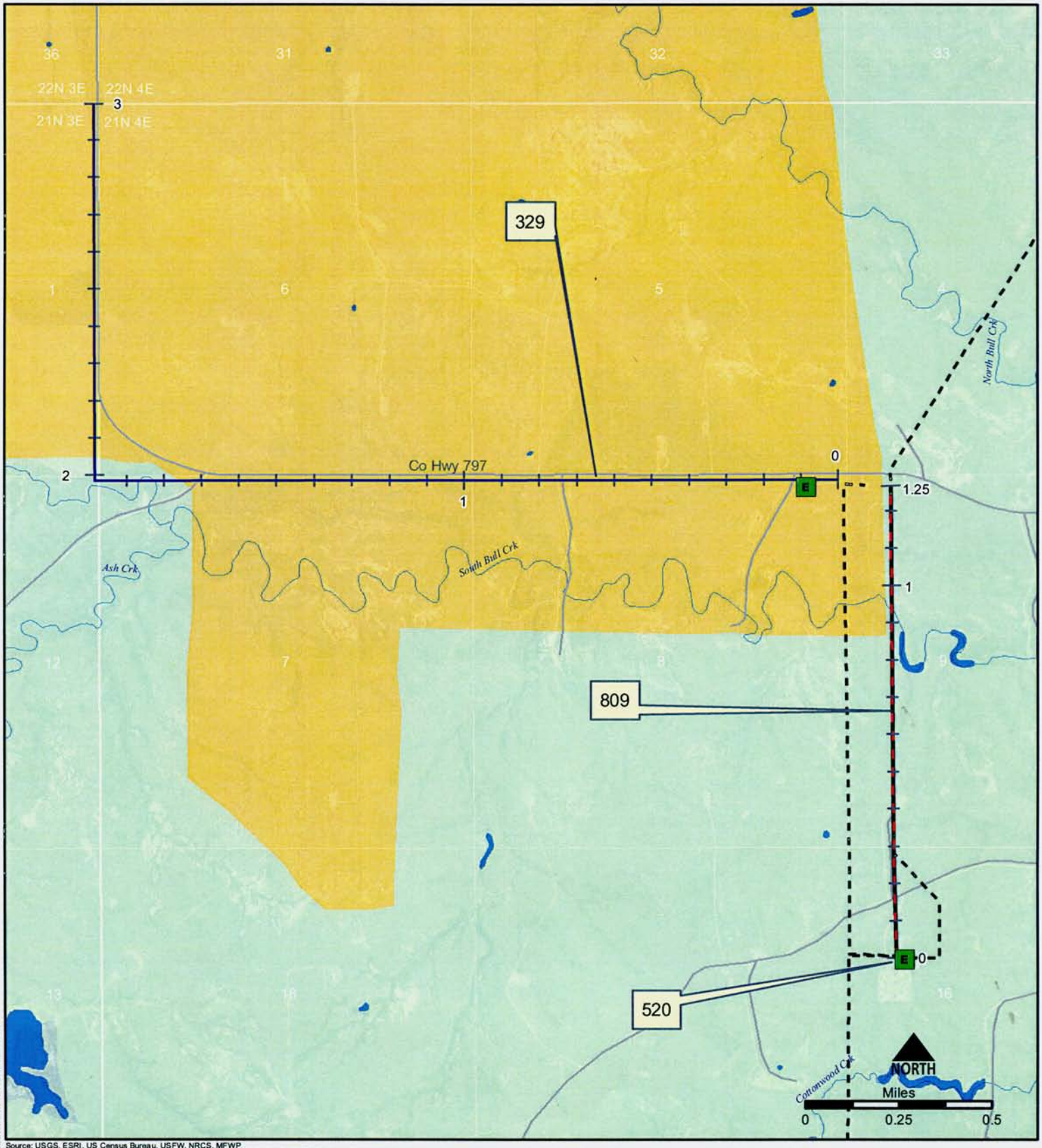
Existing Substations
Rebuild Transmission Line
Rebuild Distribution Line
Existing Transmission Lines
Roads
Streams
BLM
State
Private

PS 15
Service Area
Jurisdiction
Projects 329, 809, 520

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_329_809_Jurisdiction.mxd 10/14/2010 8:29:10 AM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

- Existing Substations
- Rebuild Distribution Line
- Rebuild Transmission Line
- Existing Transmission Lines
- Roads
- Streams
- Cropland and Pasture
- Herbaceous Rangeland

PS 15
Service Area
Land Use
Projects 329, 809, 520

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_329_809_Jurisdiction.mxd 10/14/2010 8:29:10 AM

329

809

520

Co Hwy 797

Ash Crk

South Bull Crk

North Bull Crk

Cottonwood Crk

NORTH

Miles

0 0.25 0.5

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

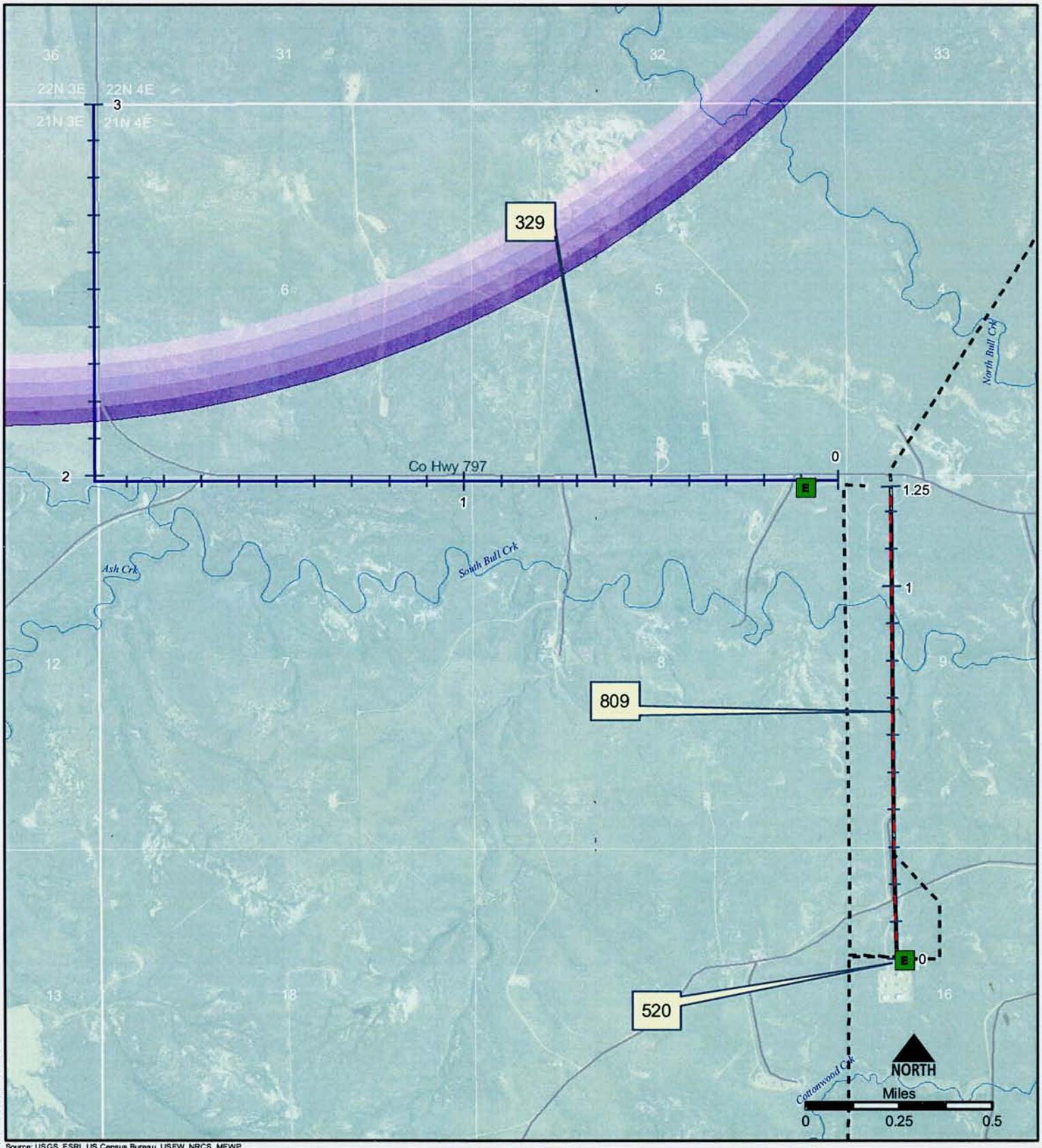
Existing Substations
Rebuild Distribution Line
Rebuild Transmission Line
Existing Transmission Lines
Roads
Streams
All areas are prime farmland
Farmland of statewide importance
Non-prime farmland
Prime farmland if irrigated

PS 15
Service Area
Prime Farmland
Projects 329, 809, 520

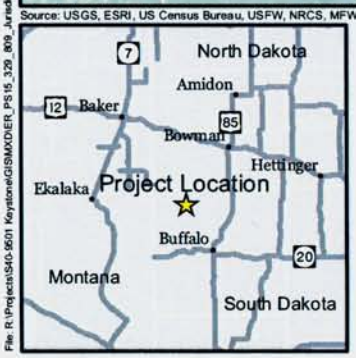
GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_329_809_Jurisdiction.mxd 10/14/2010 8:29:10 AM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP



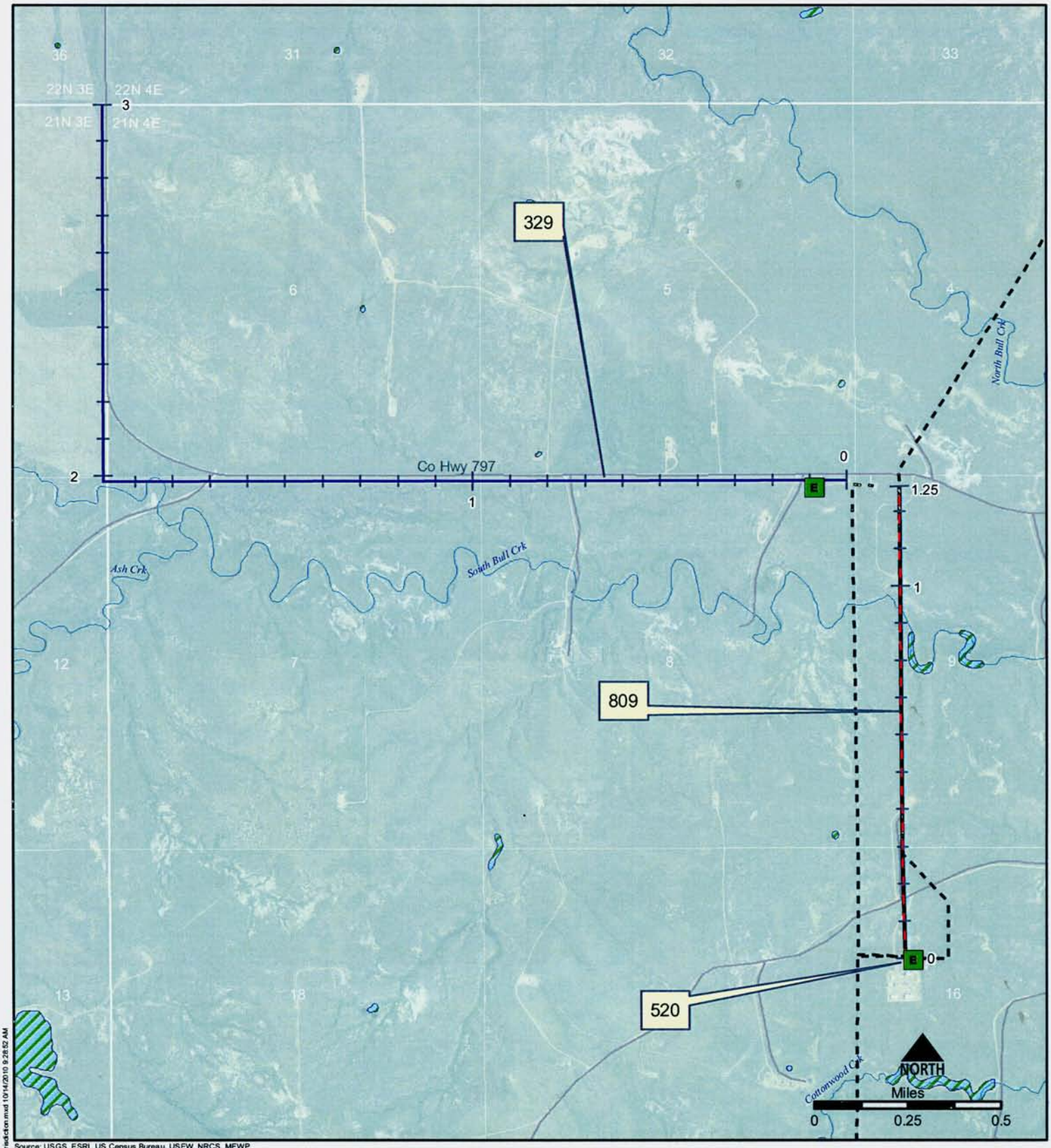
- Existing Substations
- Rebuild Distribution Line
- Rebuild Transmission Line
- Existing Transmission Lines
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 15
Service Area
Sage Grouse
Projects 329, 809, 520

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\S40-9501 Keystone\GIS\MXD\ER_PS15_329_809_Jurisdiction.mxd 10/14/2010 9:28:52 AM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

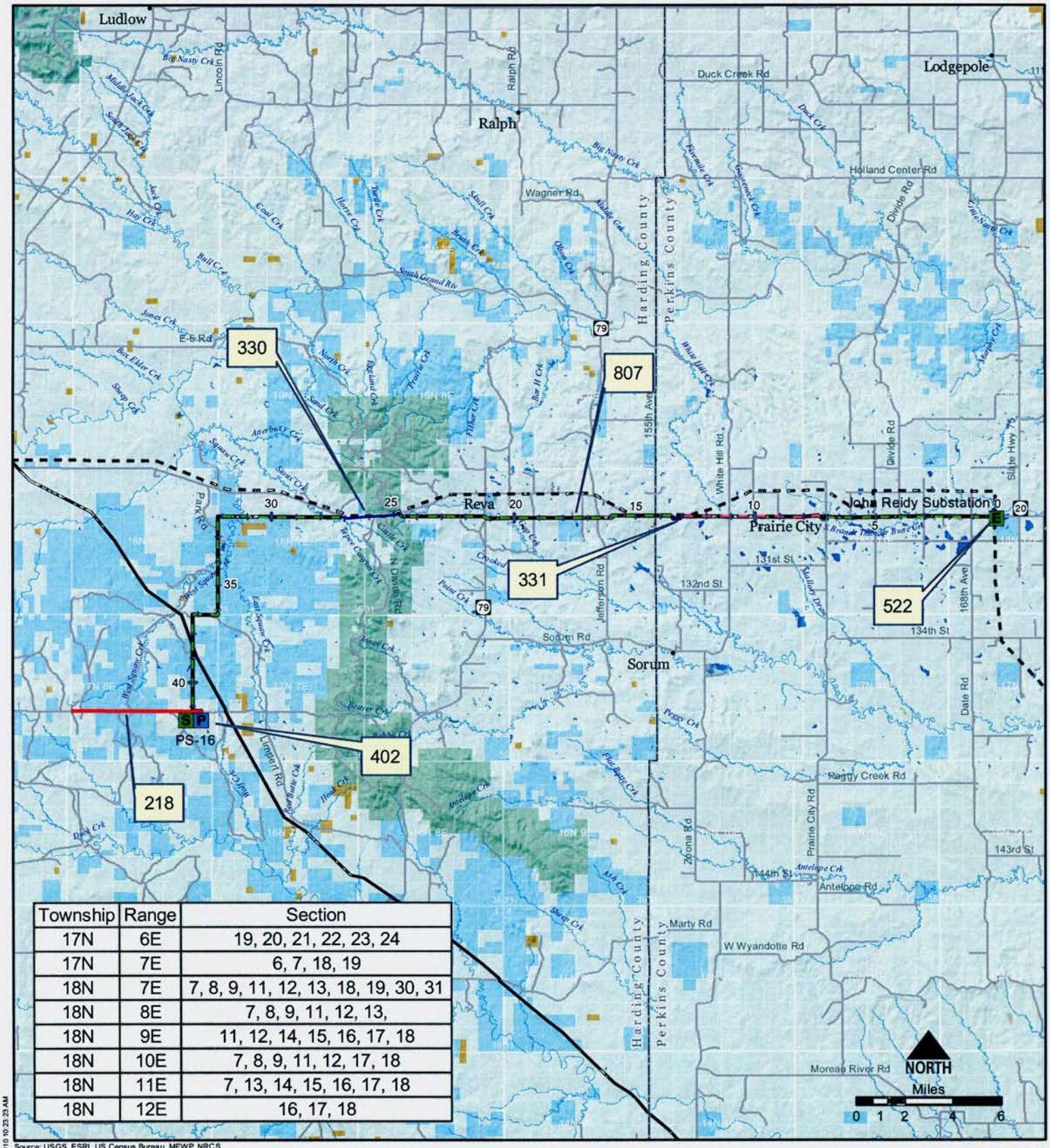
- Existing Substations
- Rebuild Distribution Line
- Rebuild Transmission Line
- Existing Transmission Lines
- Roads
- Streams
- Wetlands

PS 15
Service Area
Wetlands
Projects 329, 809, 520

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS15_329_809_Jurisdiction.mxd 10/14/2010 9:28:52 AM



Township	Range	Section
17N	6E	19, 20, 21, 22, 23, 24
17N	7E	6, 7, 18, 19
18N	7E	7, 8, 9, 11, 12, 13, 18, 19, 30, 31
18N	8E	7, 8, 9, 11, 12, 13,
18N	9E	11, 12, 14, 15, 16, 17, 18
18N	10E	7, 8, 9, 11, 12, 17, 18
18N	11E	7, 13, 14, 15, 16, 17, 18
18N	12E	16, 17, 18

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

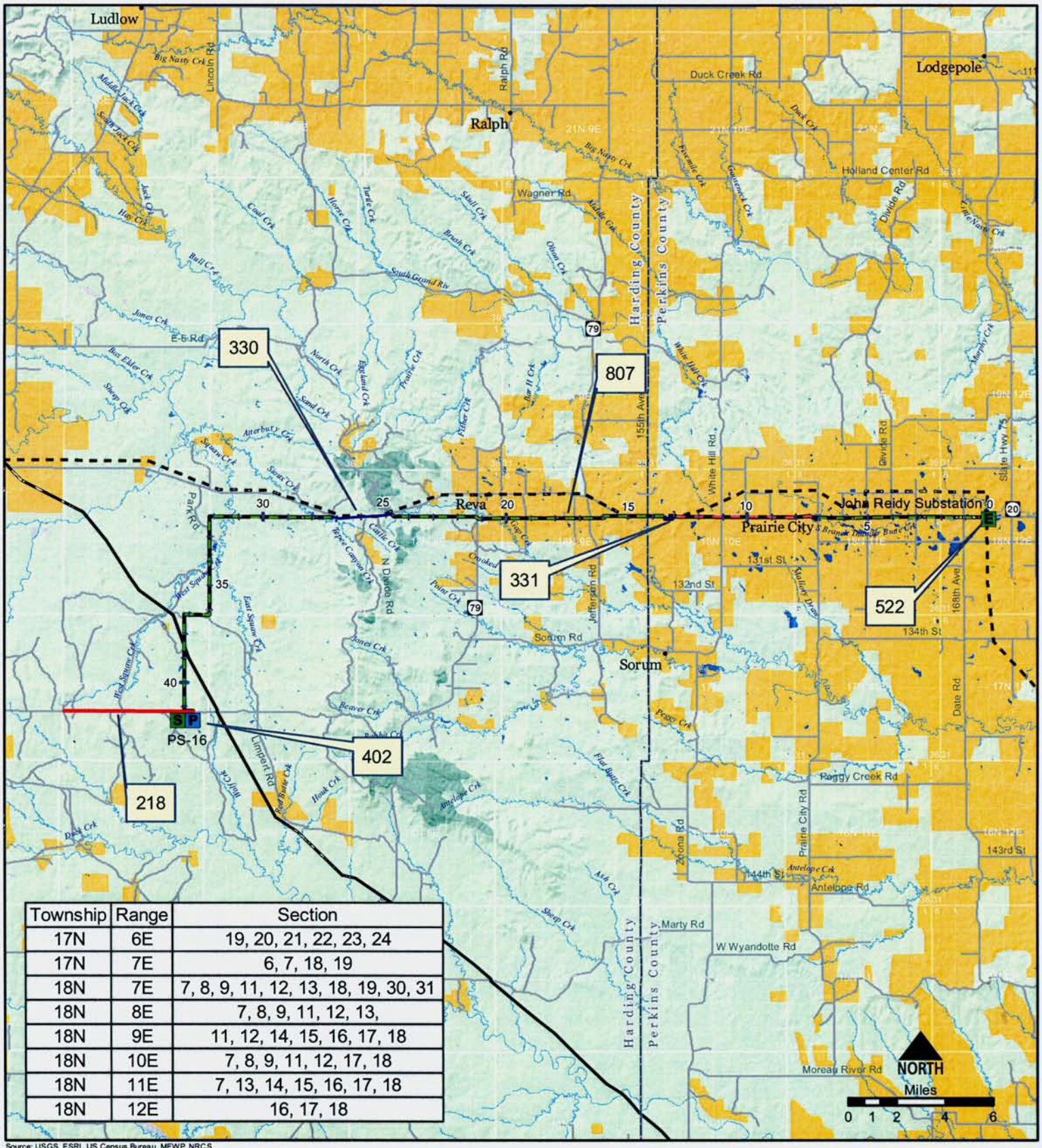
- Pumping Station-16
- Proposed Substation
- Existing Substation
- New Transmission Line
- Underbuilt Section
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Line
- Proposed Keystone Pipeline
- Roads
- Streams
- BLM
- USFS
- State
- Private

PS 16
Service Area
Jurisdiction

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-5601 Keystone\GIS\MXD\ER_PS16.mxd 10/14/2010 10:23:23 AM



Township	Range	Section
17N	6E	19, 20, 21, 22, 23, 24
17N	7E	6, 7, 18, 19
18N	7E	7, 8, 9, 11, 12, 13, 18, 19, 30, 31
18N	8E	7, 8, 9, 11, 12, 13,
18N	9E	11, 12, 14, 15, 16, 17, 18
18N	10E	7, 8, 9, 11, 12, 17, 18
18N	11E	7, 13, 14, 15, 16, 17, 18
18N	12E	16, 17, 18

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

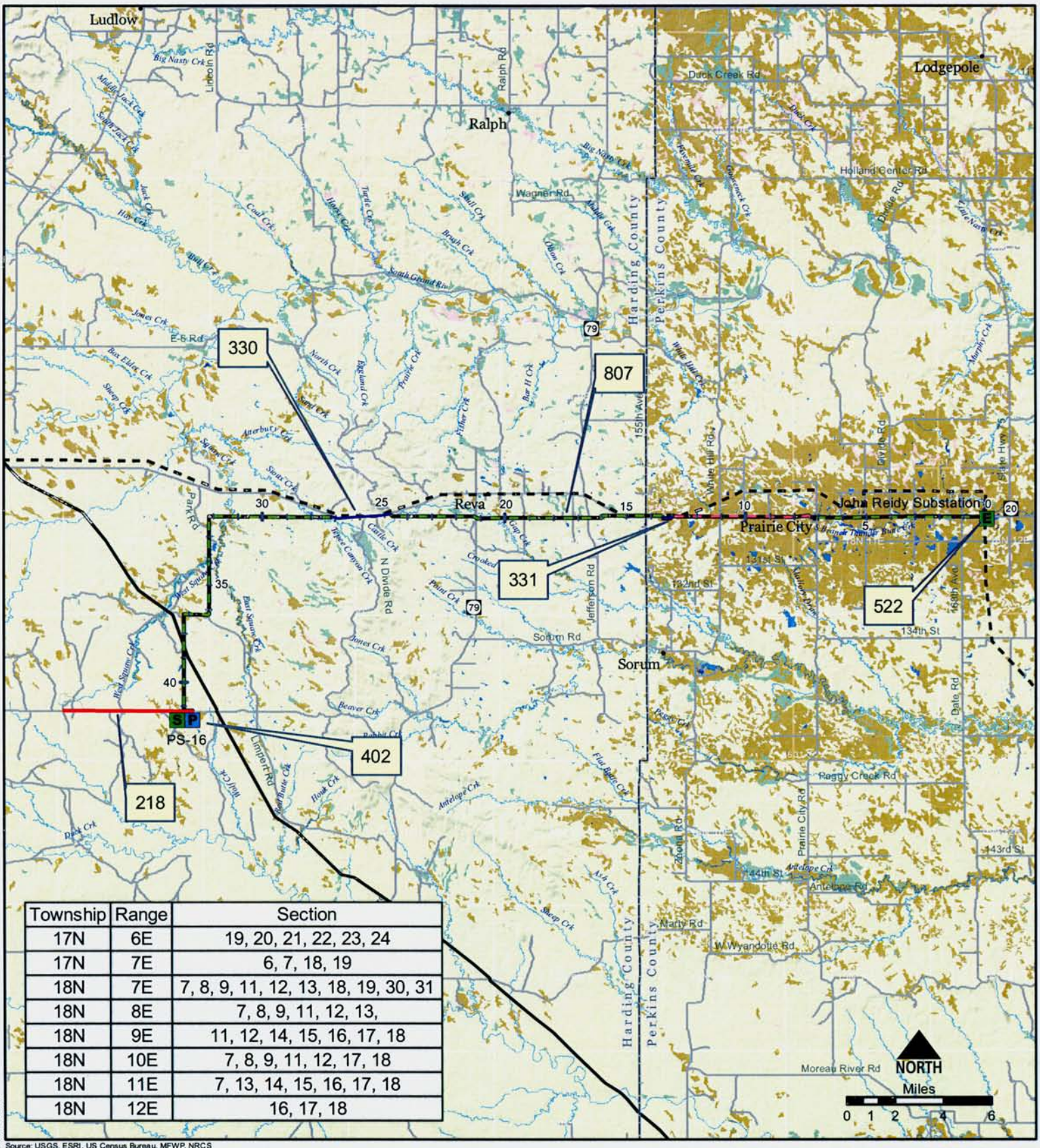
- Pumping Station-16
- Proposed Substation
- Existing Substation
- New Transmission Line
- Underbuilt Section
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Line
- Proposed Keystone Pipeline
- Roads
- Streams
- Cropland and pasture
- Evergreen forest land
- Herbaceous Rangeland

PS 16
Service Area
Land Use

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS16.mxd 10/14/2010 10:23:23 AM



Township	Range	Section
17N	6E	19, 20, 21, 22, 23, 24
17N	7E	6, 7, 18, 19
18N	7E	7, 8, 9, 11, 12, 13, 18, 19, 30, 31
18N	8E	7, 8, 9, 11, 12, 13,
18N	9E	11, 12, 14, 15, 16, 17, 18
18N	10E	7, 8, 9, 11, 12, 17, 18
18N	11E	7, 13, 14, 15, 16, 17, 18
18N	12E	16, 17, 18

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

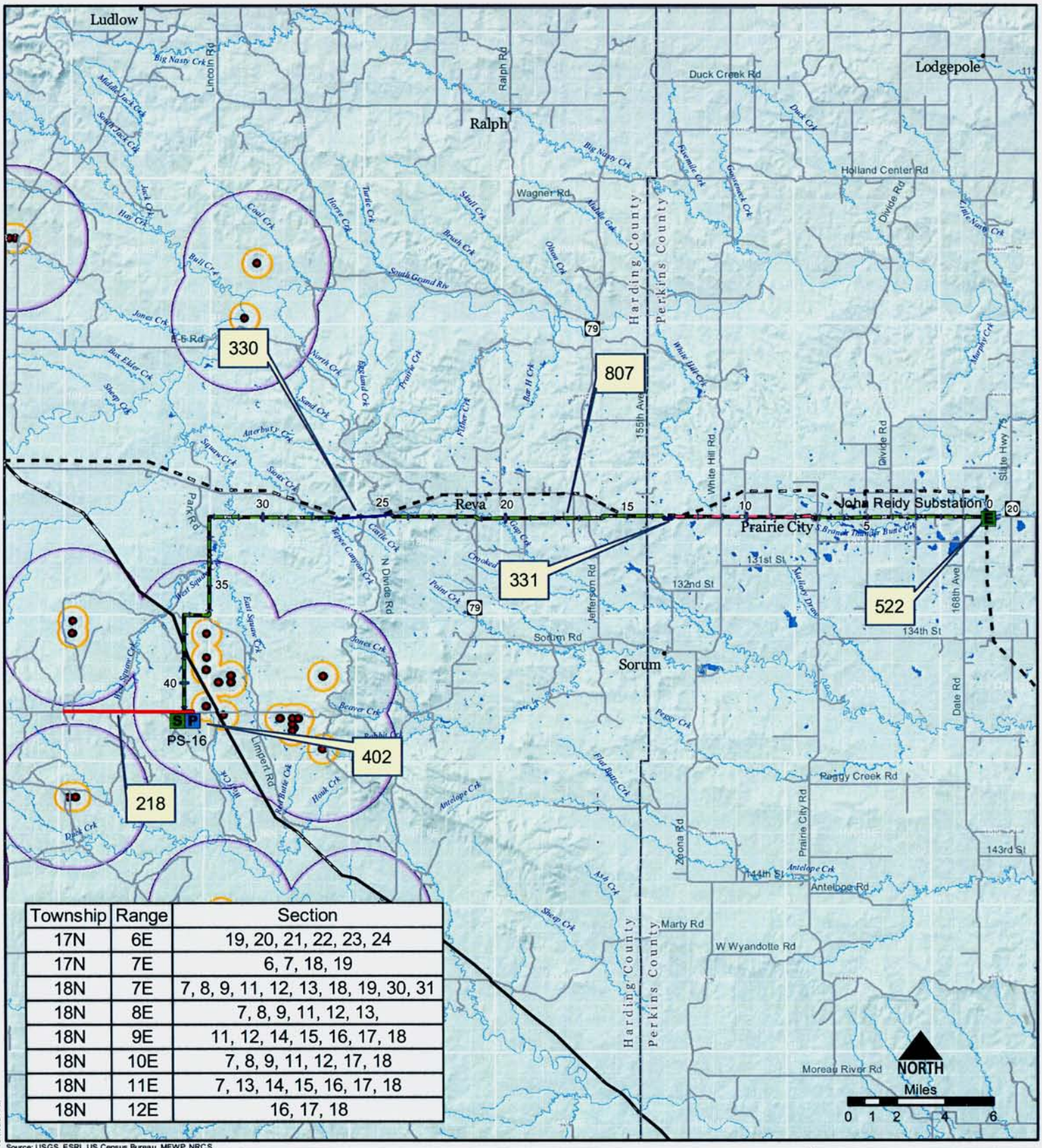
- Pumping Station-16
- Proposed Substation
- Existing Substation
- New Transmission Line
- Underbuilt Section
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Line
- Proposed Keystone Pipeline
- Roads
- Streams
- All areas are prime farmland
- Farmland of statewide importance
- Non-prime farmland
- Prime farmland if irrigated

PS 16
Service Area
Prime Farmland

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-5601 Keystone\GIS\MXD\ER_PS16.mxd 10/14/2010 10:23:23 AM



Township	Range	Section
17N	6E	19, 20, 21, 22, 23, 24
17N	7E	6, 7, 18, 19
18N	7E	7, 8, 9, 11, 12, 13, 18, 19, 30, 31
18N	8E	7, 8, 9, 11, 12, 13,
18N	9E	11, 12, 14, 15, 16, 17, 18
18N	10E	7, 8, 9, 11, 12, 17, 18
18N	11E	7, 13, 14, 15, 16, 17, 18
18N	12E	16, 17, 18

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

- Pumping Station-16
- Proposed Substation
- Existing Substation
- New Transmission Line
- Underbuilt Section
- Rebuild Distribution Line
- New Distribution Line
- Existing Transmission Line
- Proposed Keystone Pipeline
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 16
Service Area
Sage Grouse

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS16.mxd 10/13/2010 1:05:31 PM

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

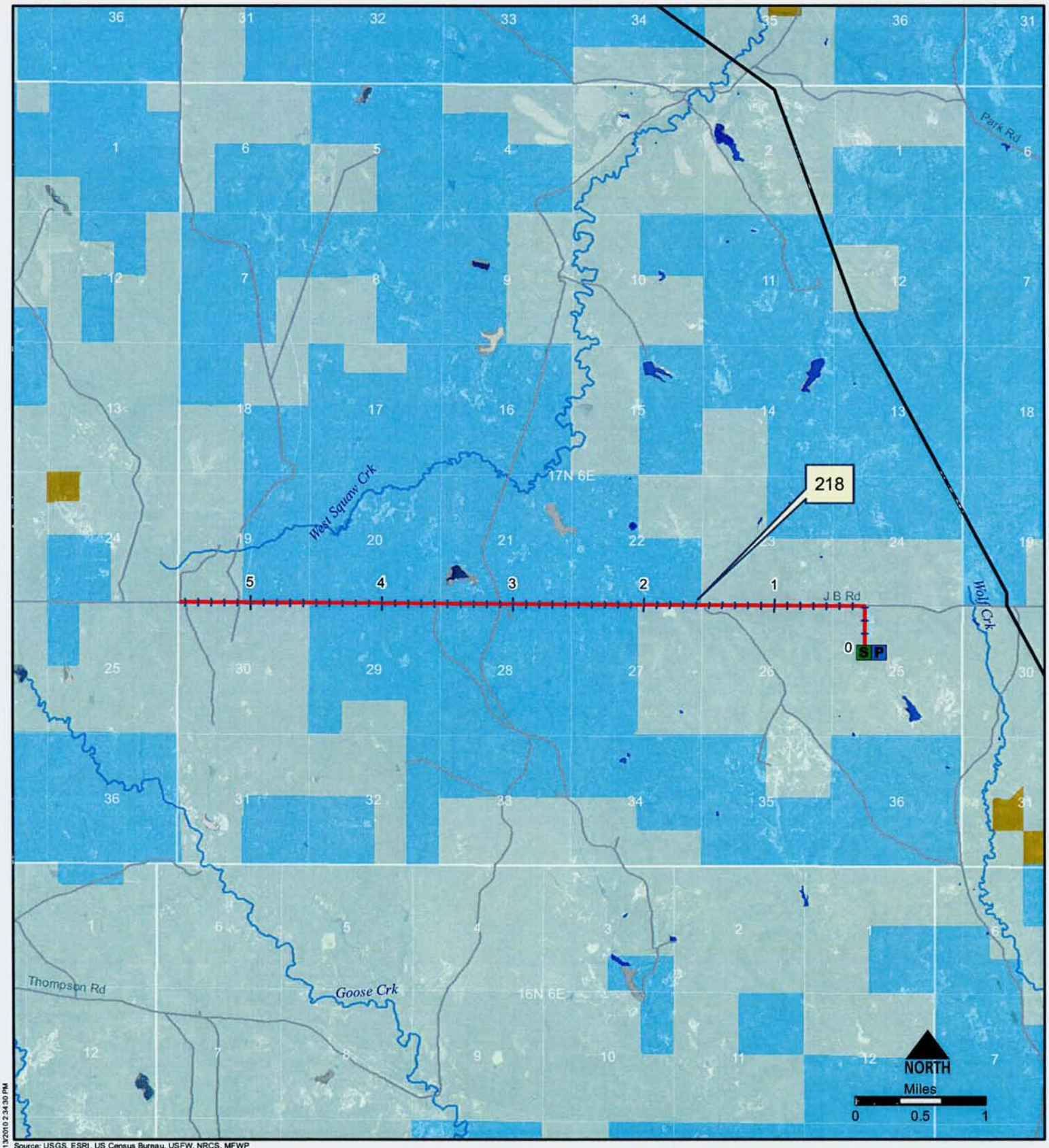
Rebuild Distribution Line
Existing Transmission Line
Roads
Streams
Wetlands

PS 16
Service Area
Wetlands
Projects 330, 331

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS16_330_331.mxd 10/13/2010 3:44:05 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

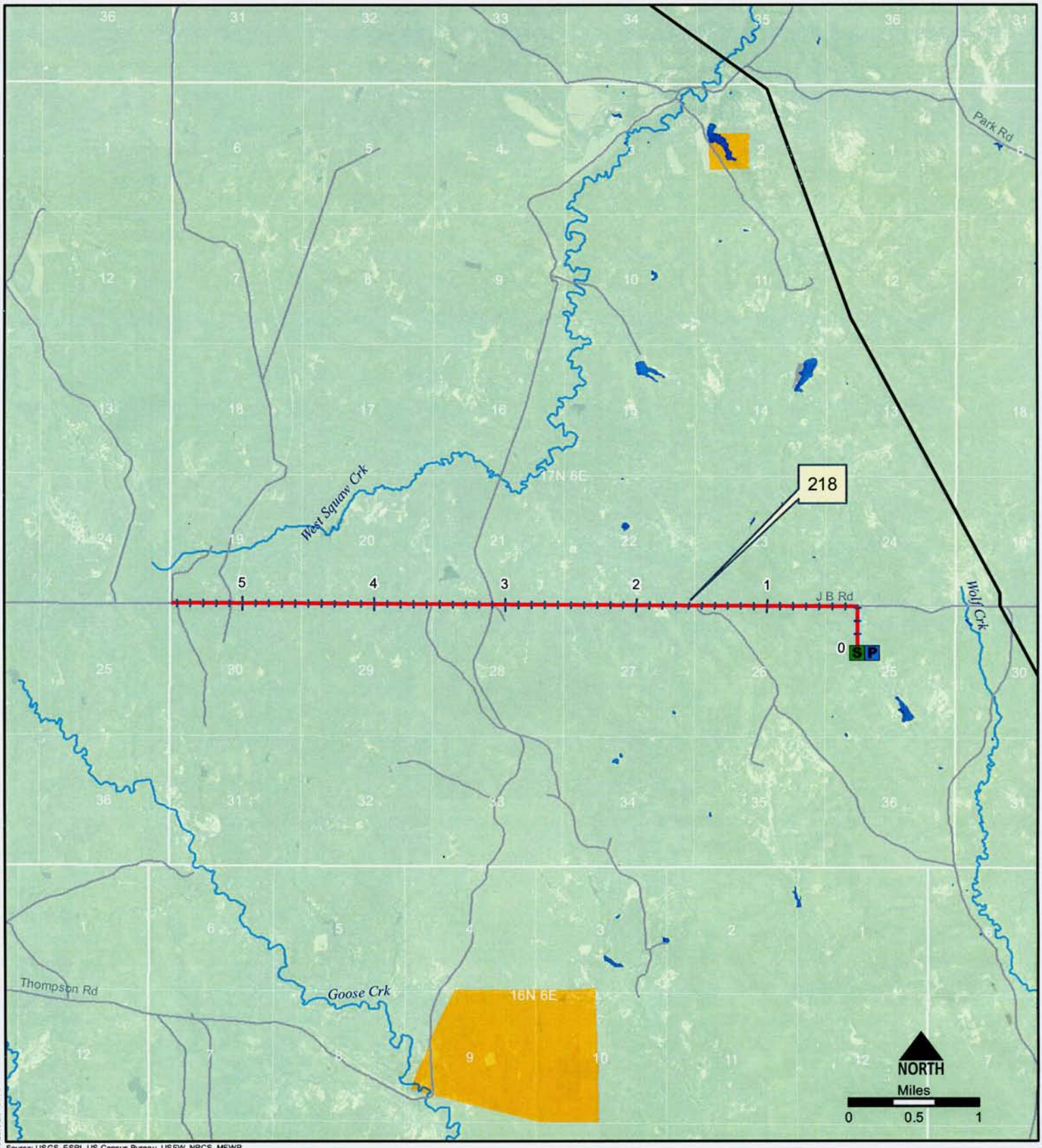
- Pumping Station-16
- Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- BLM
- USFS
- State
- Private

PS 16
Service Area
Jurisdiction
Project 218

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS16_218.mxd 10/13/2010 2:34:30 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

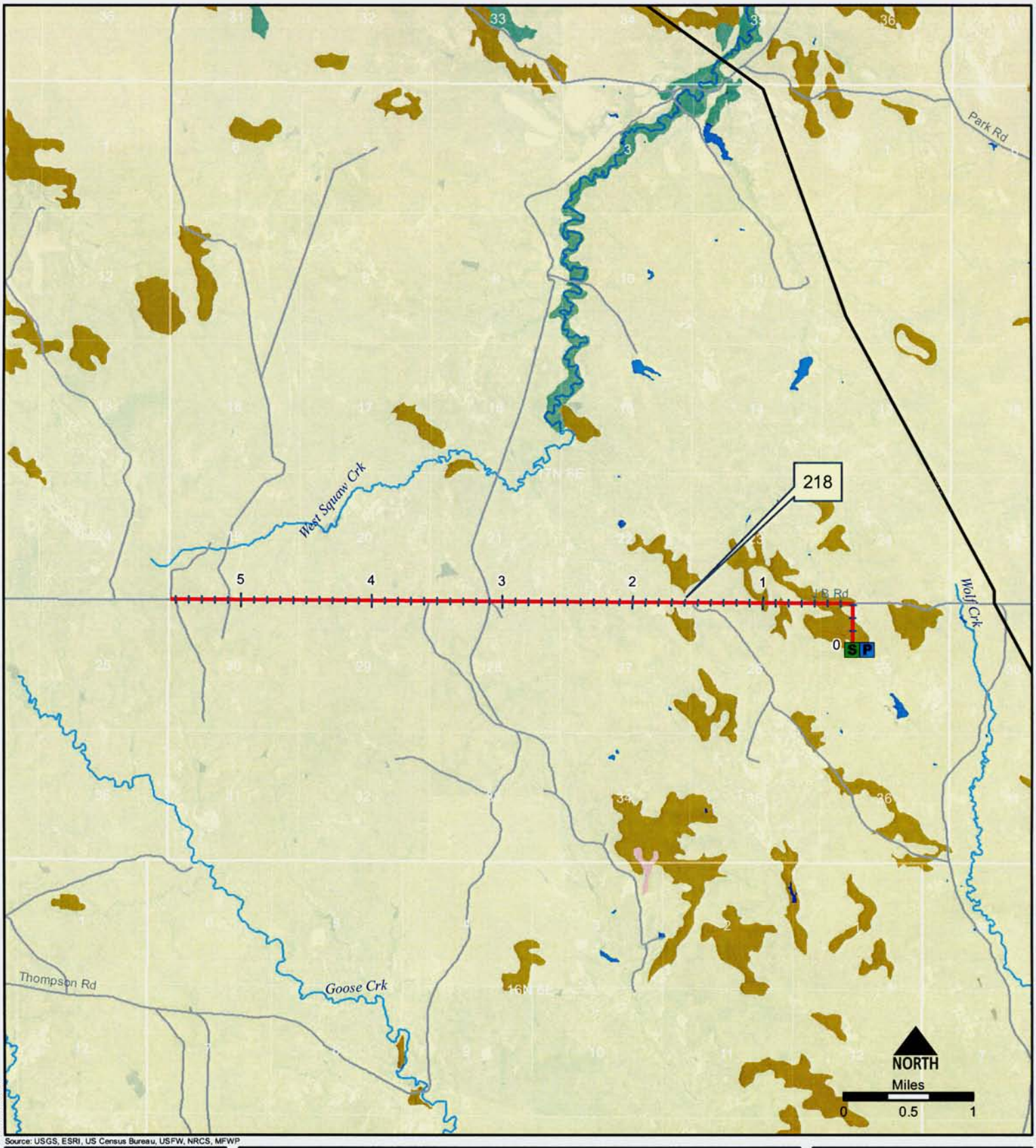
- P Pumping Station-16
- S Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- Cropland and pasture
- Evergreen forest land
- Herbaceous Rangeland

PS 16
Service Area
Land Use
Project 218

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS16_218.mxd 10/13/2010 2:34:30 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

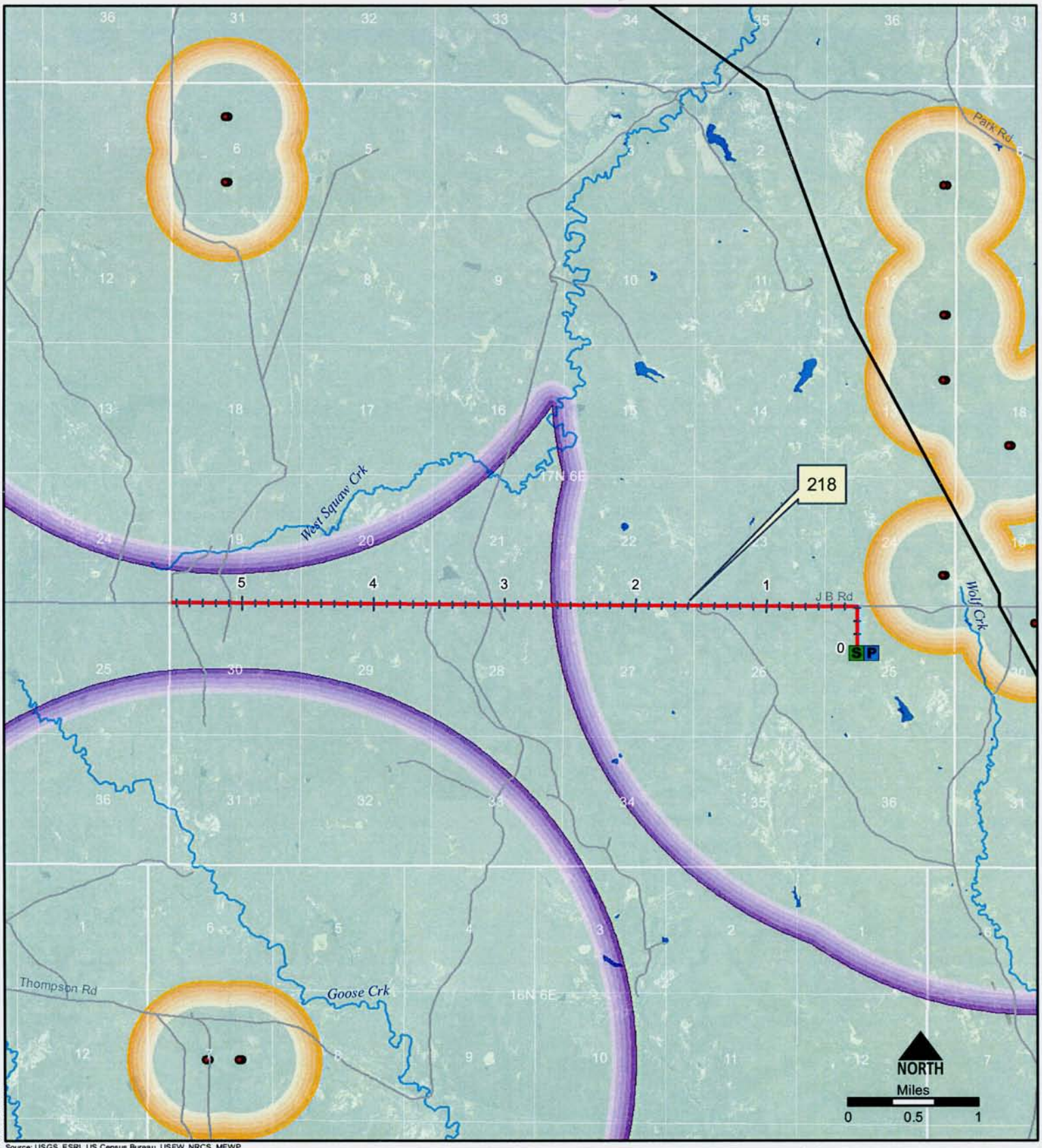
- P Pumping Station-16
- S Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- All areas are prime farmland
- Farmland of statewide importance
- Non-prime farmland
- Prime farmland if irrigated

PS 16
Service Area
Prime Farmland
Project 218

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS 16_218.mxd 10/13/2010 2:34:30 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

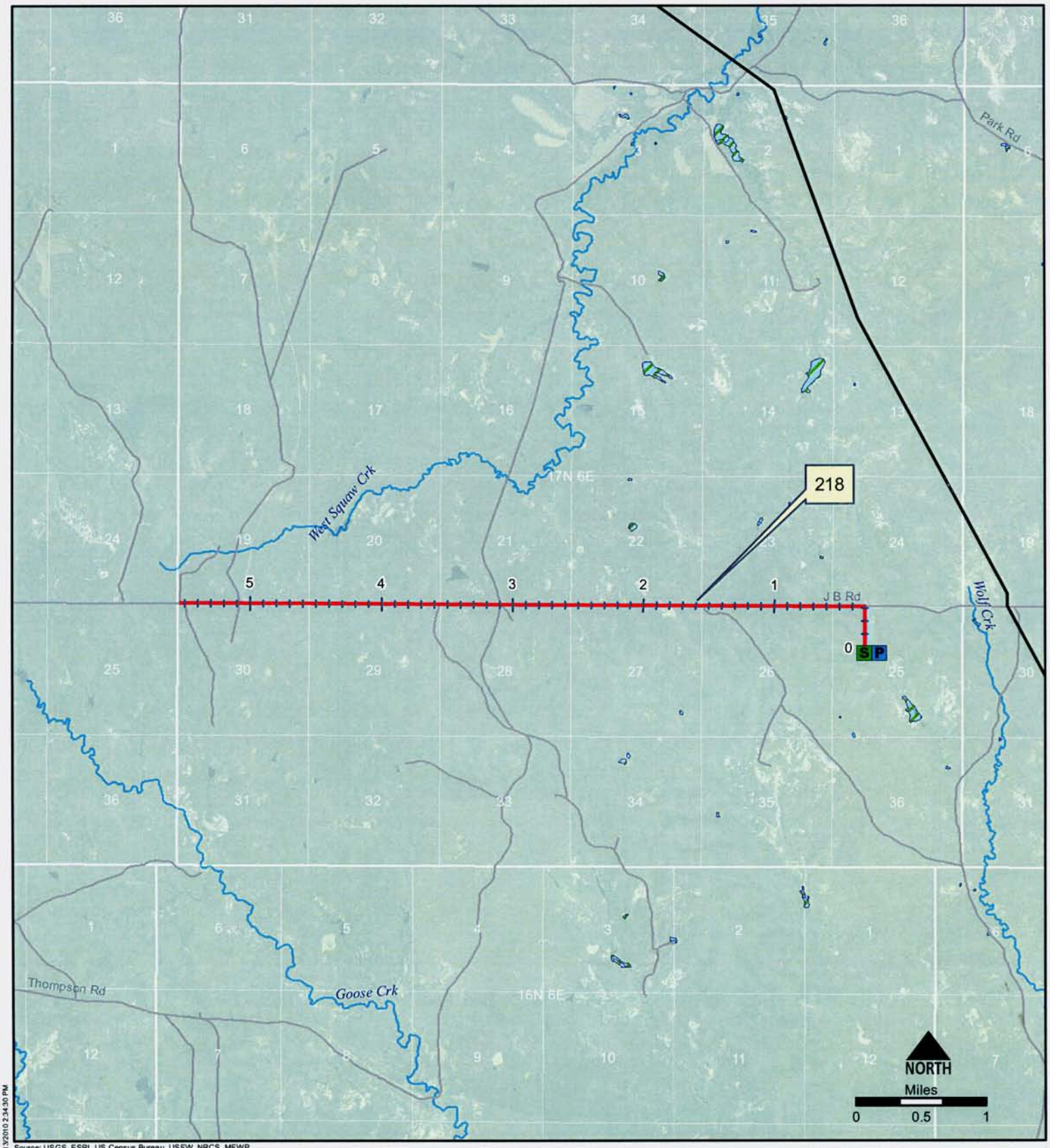
- P Pumping Station-16
- S Proposed Substation
- New Distribution Line Construction
- Proposed Keystone Pipeline
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 16
Service Area
Sage Grouse
Project 218

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-6501 Keystone\GIS\MXD\ER_PS 16_218.mxd 10/13/2010 2:34:30 PM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

P Pumping Station-16
S Proposed Substation
New Distribution Line Construction
Proposed Keystone Pipeline
Roads
Streams
Wetlands

PS 16
Service Area
Wetlands
Project 218

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9601 Keystone\GIS\MXD\ER_PS16_218.mxd 10/13/2010 2:34:30 PM

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

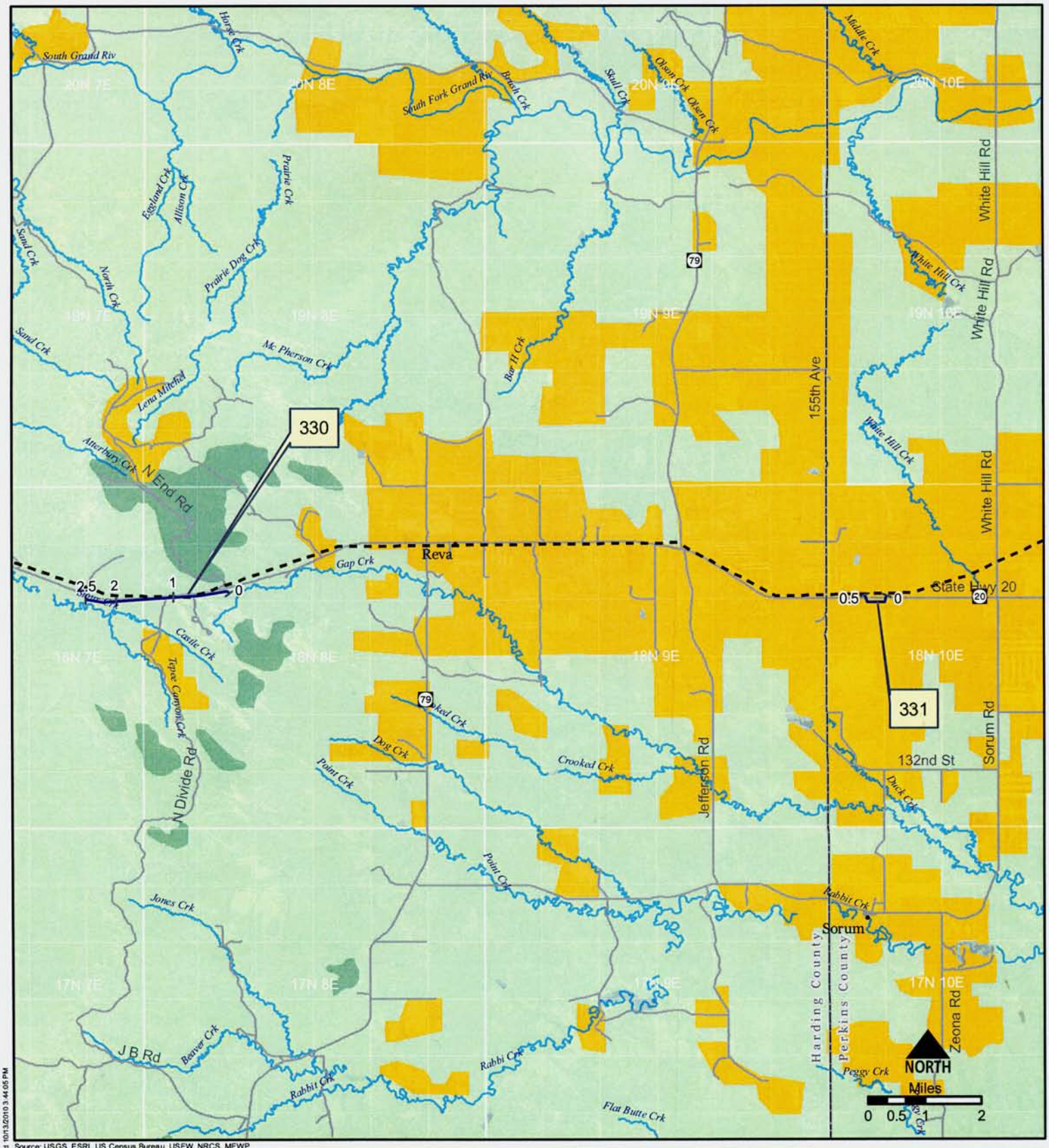
- Rebuild Distribution Line
- Existing Transmission Line
- Roads
- Streams
- BLM
- USFS
- State
- Private

PS 16
Service Area
Jurisdiction
Projects 330, 331

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS16_330_331.mxd 10/13/2010 3:44:05 PM


330
331
Reva
Sorum
State Hwy 20
155th Ave
White Hill Rd
Jefferson Rd
Sorum Rd
Zeona Rd
132nd St
N End Rd
N Divide Rd
J B Rd
Harding County
Perkins County
South Grand Riv
South Fork Grand Riv
Horse Crk
Brush Crk
Skull Crk
Olson Crk
Middle Crk
Eggland Crk
Allison Crk
Prairie Crk
Prairie Dog Crk
Sand Crk
North Crk
Mc Pherson Crk
Bar H Crk
Lena Mitchell
Atterbury Crk
Gap Crk
Castle Crk
Tepee Canyon Crk
Crooked Crk
Dog Crk
Point Crk
Duck Crk
Jones Crk
Rabbit Crk
Beaver Crk
Flat Butte Crk
Peggy Crk
NORTH
Miles
0 0.5 1 2
Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP
North Dakota
Amidon
Baker
Bowman
Hettinger
Ekalaka
Buffalo
Project Location
Montana
South Dakota
Rebuild Distribution Line
Existing Transmission Line
Roads
Streams
Cropland and pasture
Evergreen forest land
Herbaceous Rangeland
PS 16
Service Area
Land Use
Projects 330, 331
GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA
ECI
ELECTRICAL CONSULTANTS, INC.

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS16_330_331.mxd 10/13/2010 3:44:05 PM

- Rebuild Distribution Line
- Existing Transmission Line
- Roads
- Streams

- All areas are prime farmland
- Farmland of statewide importance
- Non-prime farmland
- Prime farmland if irrigated

PS 16
Service Area
Prime Farmland
Projects 330, 331

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

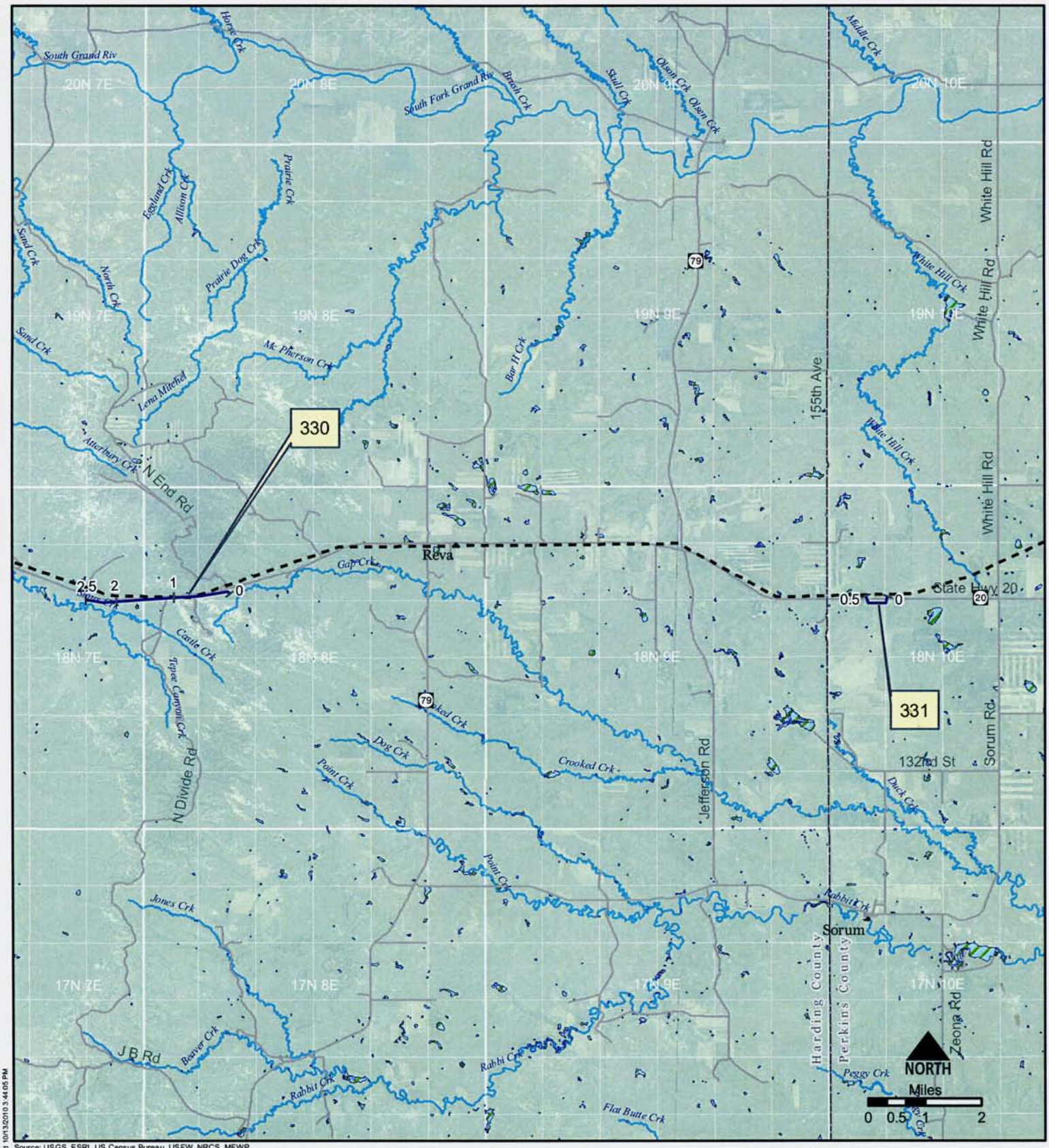
- Rebuild Distribution Line
- Existing Transmission Line
- Roads
- Streams
- Sage Grouse Survey Points
- .6 mile No Build Buffer
- 3 mile Restricted Building Buffer

PS 16
Service Area
Sage Grouse
Projects 330, 331

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-6501 Keystone\GIS\MXD\ER_PS16_330_331.mxd 10/14/2010 9:46:43 AM



Source: USGS, ESRI, US Census Bureau, USFW, NRCS, MFWP

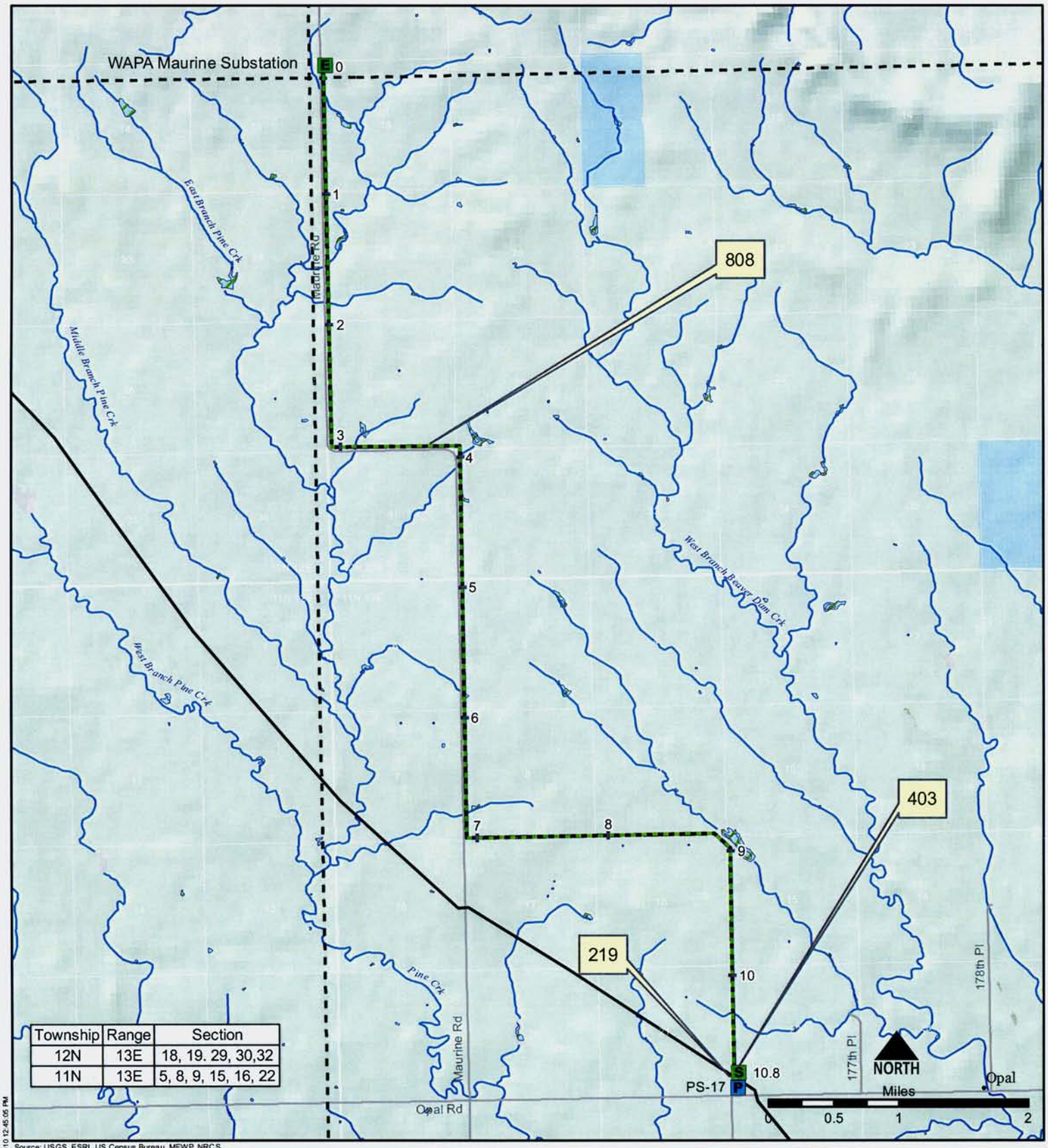
Rebuild Distribution Line
Existing Transmission Line
Roads
Streams
Wetlands

PS 16
Service Area
Wetlands
Projects 330, 331

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\S40-9501 Keystone\GIS\MXD\ER_PS16_330_331.mxd 10/13/2010 3:44:05 PM



Township	Range	Section
12N	13E	18, 19. 29, 30,32
11N	13E	5, 8, 9, 15, 16, 22

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

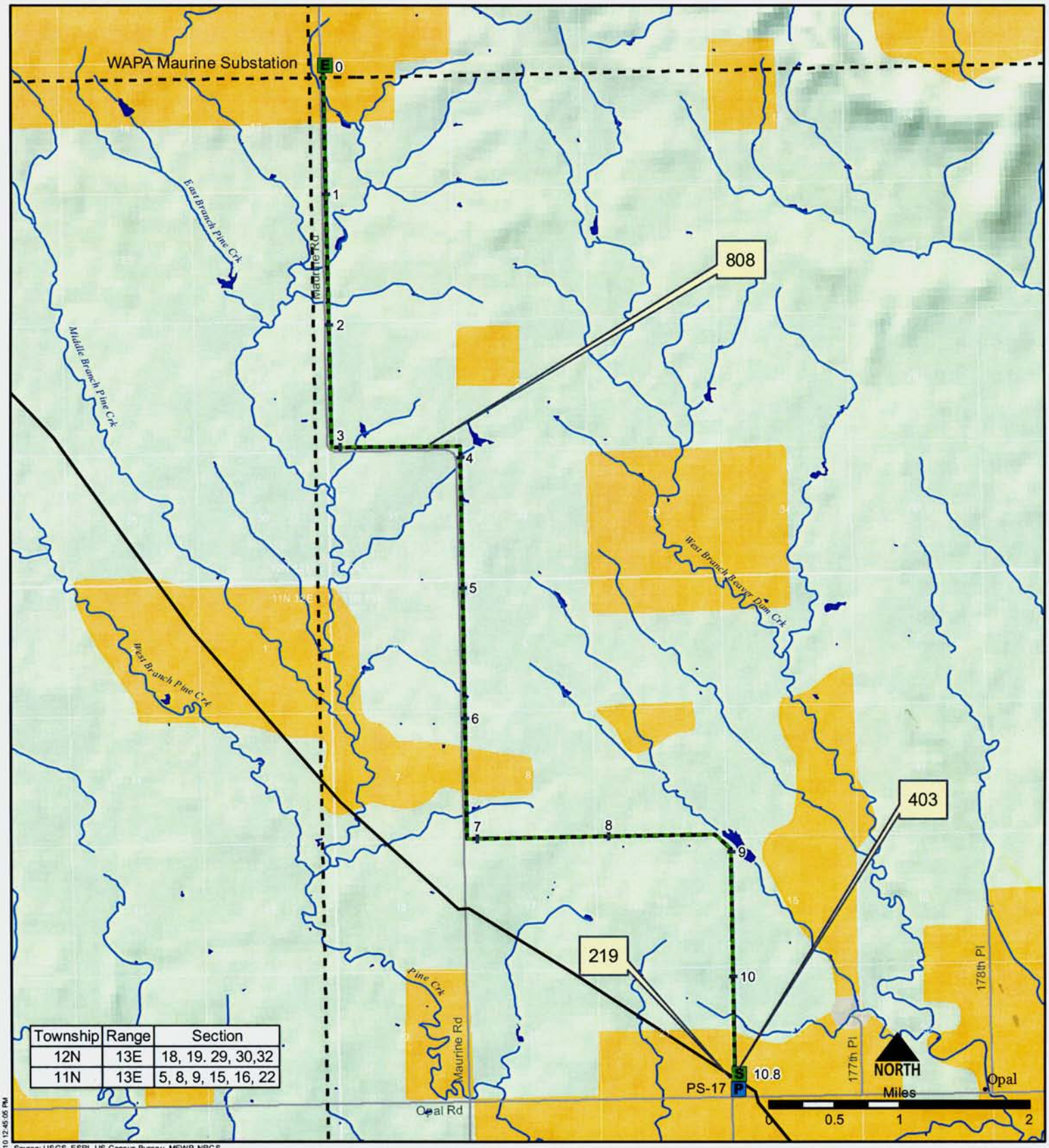
- Pumping Station-17
- Proposed Substation
- Existing Substation
- New Transmission Line Construction
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- State
- Private

PS 17
Service Area
Jurisdiction

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS17.mxd 10/13/2010 12:45:05 PM



Township	Range	Section
12N	13E	18, 19. 29, 30,32
11N	13E	5, 8, 9, 15, 16, 22

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

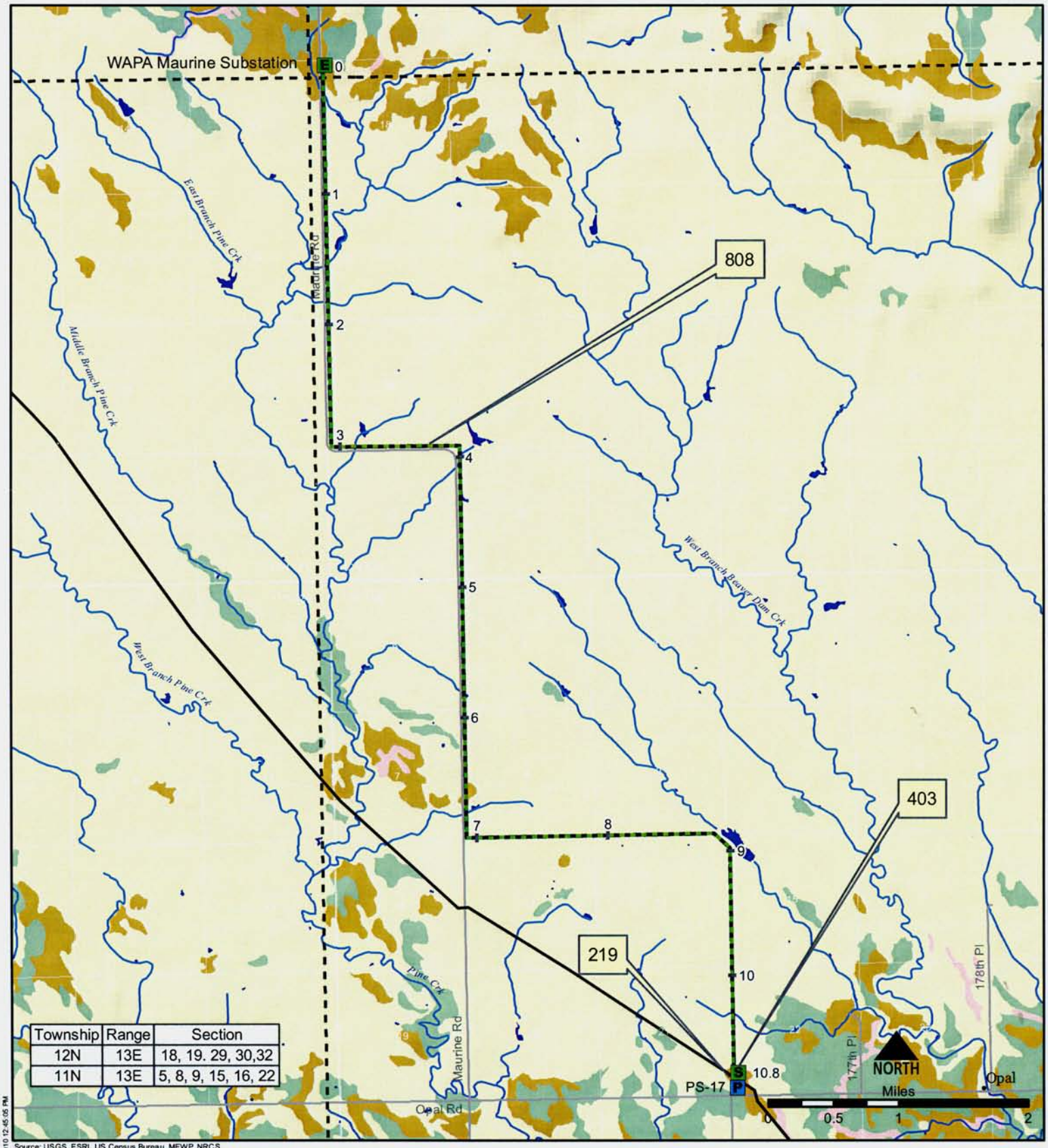
- P Pumping Station-17
- S Proposed Substation
- E Existing Substation
- New Transmission Line Construction
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- Cropland and pasture
- Other Agricultural Land
- Herbaceous Rangeland

PS 17
Service Area
Land Use

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS17.mxd 10/13/2010 12:45:05 PM



Township	Range	Section
12N	13E	18, 19. 29, 30,32
11N	13E	5, 8, 9, 15, 16, 22

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

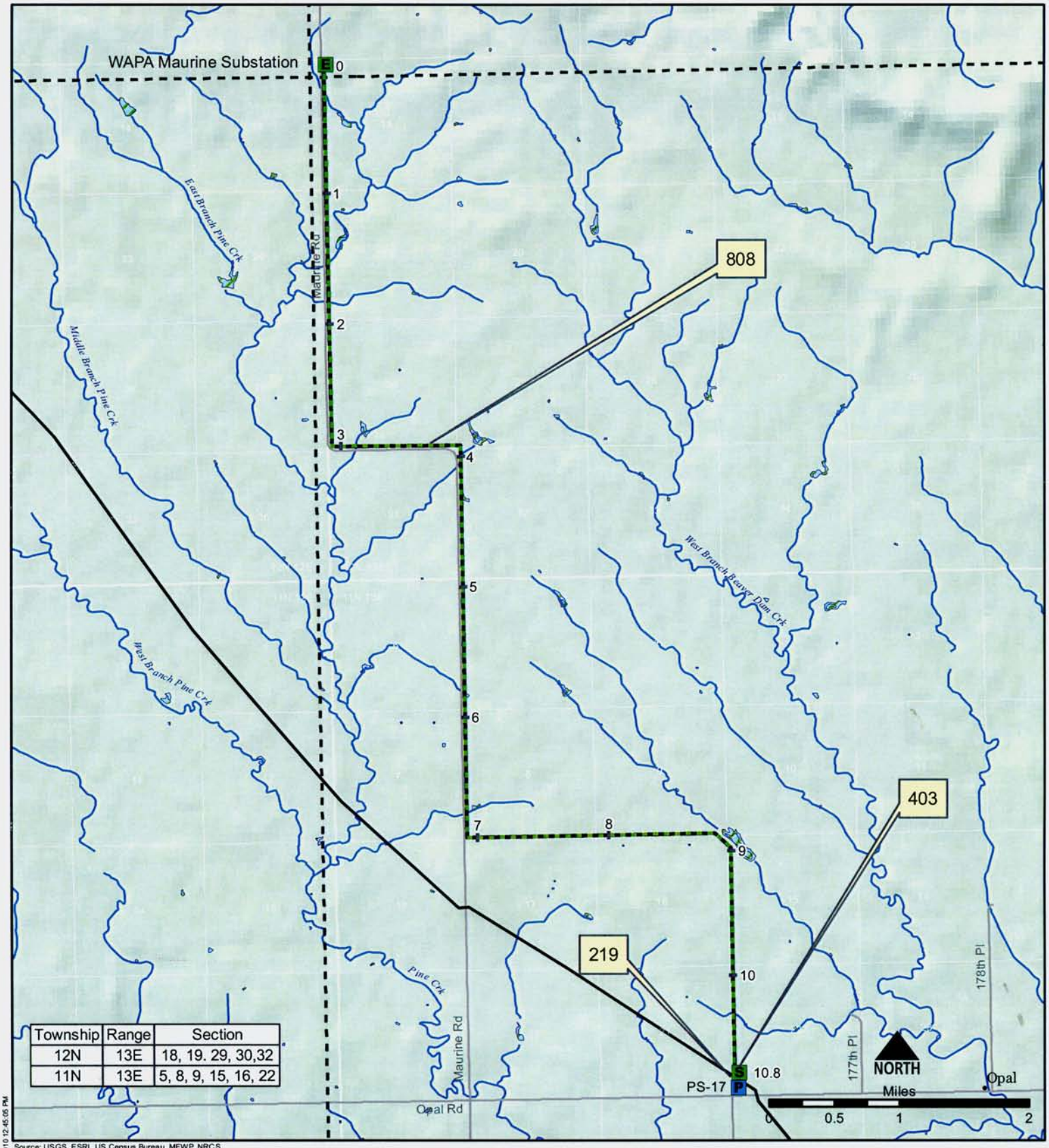
- Pumping Station-17
- Proposed Substation
- Existing Substation
- New Transmission Line Construction
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- All areas are prime farmland
- Farmland of statewide importance
- Non-Prime farmland
- Prime farmland if irrigated

PS 17
Service Area
Prime Farmland

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS17.mxd 10/13/2010 12:45:05 PM



Township	Range	Section
12N	13E	18, 19. 29, 30,32
11N	13E	5, 8, 9, 15, 16, 22

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

- P Pumping Station-17
- S Proposed Substation
- E Existing Substation
- New Transmission Line Construction
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams

No Sage Grouse found in the project area.

PS 17
Service Area
Sage Grouse

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

File: R:\Projects\540-9501 Keystone\GIS\MXD\ER_PS17.mxd 10/13/2010 12:45:05 PM

WAPA Maurine Substation

East Branch Pine Crk

Middle Branch Pine Crk

West Branch Pine Crk

West Branch Beaver Dam Crk

Pine Crk

Maurine Rd

Opal Rd

178th Pl

177th Pl

808

403

219

PS-17

10.8

Opal

NORTH

Miles

0 0.5 1 2

Township	Range	Section
12N	13E	18, 19. 29, 30,32
11N	13E	5, 8, 9, 15, 16, 22

Source: USGS, ESRI, US Census Bureau, MFWP, NRCS

File: R:\Projects\S40-9501 Keystone\GIS\MXD\ER_PS17.mxd 10/13/2010 12:45:05 PM

- Pumping Station-17
- Proposed Substation
- Existing Substation
- New Transmission Line Construction
- Existing Transmission Lines
- Proposed Keystone Pipeline
- Roads
- Streams
- Wetlands

PS 17
Service Area
Wetlands

GRAND ELECTRIC COOPERATIVE
BISON, SOUTH DAKOTA

ECI
ELECTRICAL CONSULTANTS, INC.

-Page intentionally left blank-