Bear Den Project
Environmental Assessment

Cooperating Agencies:

U.S. Forest Service **U.S. Fish and Wildlife Service**

June 2013

BLM

Bureau of Land Management, North Dakota Field Office, Dickinson, North Dakota

U.S. Department of the Interior

Bureau of Land Management

North Dakota Field Office

Environmental Assessment for the Bear Den Project

NUMBER: DOI-BLM-MT-C030-2013-123-EA

June 2013

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List of Acronyms

AAQS	Ambient Air Quality Standards
amsl	above mean sea level
APE	area of potential effects
ARPA	Archaeological Resources Protection Act
BA	Biological Assessment
Bbl	barrel
Bbl/d	barrels per day
BCR	Bird Conservation Region
BE	Biological Evaluation
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
BOR	Bureau of Reclamation
CAA	Clean Air Act
CEBCS	CenterPoint Energy Bakken Crude Services, LLC
CEFS	CenterPoint Energy Field Services, LLC
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CH_4	methane
COE	U.S. Army Corps of Engineers
CO	carbon monoxide
dB	decibels
dBA	decibels of the A-weighted scale
EA	Environmental Assessment
EI	Environmental inspector
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FC	Federal Candidate
FE	Federal Endangered
FEIS	Final Environmental Impact Statement
FS	USFS/BLM Sensitive Species
FT	Federal Threatened
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gases
H_2S	hydrogen sulfide
HAP	hazardous air pollutant
HDD	horizontal directional drill
Hp	horsepower
HUC	Hydrologic Unit Code
IM	Instructional Memorandum
LACT	Lease Automatic Custody Transfer

LMNG	Little Missouri National Grasslands
LRMP	Land and Resource Management Plan
MBTA	Migratory Bird Treaty Act
MLA	Mineral Leasing Act of 1920
MLRA	major land resource areas
MOA	Memorandum of Agreement
MP	milepost
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NDCC	North Dakota Century Code
NDDH	North Dakota Department of Health
NDDMR	North Dakota Department of Mineral Resources
NDDOT	North Dakota Department of Transportation
NDGFD	North Dakota Game and Fish Department
NDGS	North Dakota Geological Survey
NDTL	North Dakota Trust Lands
NEPA	National Environmental Policy Act
NGL	natural gas liquids
NGOs	nongovernmental organizations
NHPA	National Historic Preservation Act
NO_2	nitrogen dioxide
NO_x	nitrogen oxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSPS	New Source Performance Standards
NWI	National Wetland Inventory
O&M	operations and maintenance
O_3	ozone
OHV	off-highway vehicle
ORV	off-road vehicle
OSHA	Occupational Safety and Health Administration
Pb	lead
PEM	Palustrine Emergent
PFO	Palustrine Forested
PFYC	Potential Fossil Yield Classification
PM	Particle Pollution
POD	Plan of Development
Ppb	parts per billion
ppm	parts per million
PRPA	Paleontological Resources Preservation Act
PSD	Prevention of Significant Deterioration

PSS	Palustrine Scrub-Shrub
RCRA	Resource Conservation and Recovery Act
S1	critically imperiled
S2	imperiled
S3	vulnerable
SARA	Superfund Amendments and Reauthorization Act
SHPO	State Historic Preservation Office
SNR	not ranked
SO_2	sulfur dioxide
SPCC Plan	Spill Prevention, Control, and Countermeasure Plan
SWPPP	Stormwater Pollution Prevention Plan
TSS	total suspended sediment
USC	United States Code
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRM	Visual Resource Management
W	watch list species
WEST	Western EcoSystem Technologies, Inc.
µg/m3	micrograms per cubic meter

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North Dakota Field Office
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ENVIRONMENTAL ASSESSMENT

Applicant: CenterPoint Energy Bakken Crude Services, LLC

Number: DOI-BLM-MT-C030-2013-123-EA

Case File/Project Number: NDM-104448

Project Name: Bear Den Project

Legal Description:

The Project would entail the crossing of Federal lands under the management of the Bureau of Land Management, North Dakota Field Office, and the U.S. Forest Service, McKenzie Ranger District, in the following locations:

Bureau of Land Management

- Township 148 North, Range 96 West, Section 19
- Township 148 North, Range 96 West, Section 21
- Township 148 North, Range 96 West, Section 28
- Township 148 North, Range 96 West, Section 31
- Township 148 North, Range 97 West, Section 22
- Township 148 North, Range 98 West, Section 25
- Township 148 North, Range 98 West, Section 26
- Township 148 North, Range 98 West, Section 9

U.S. Forest Service

- Township 148 North, Range 98 West, Section 15
- Township 148 North, Range 98 West, Section 23
- Township 148 North, Range 98 West, Section 24
- Township 149 North, Range 96 West, Section 19
- Township 149 North, Range 96 West, Section 20
- Township 149 North, Range 96 West, Section 30
- Township 149 North, Range 97 West, Section 11
- Township 149 North, Range 97 West, Section 12
- Township 149 North, Range 97 West, Section 13
- Township 149 North, Range 97 West, Section 14
- Township 149 North, Range 97 West, Section 15
- Township 149 North, Range 97 West, Section 17
- Township 149 North, Range 97 West, Section 20
- Township 149 North, Range 97 West, Section 23
- Township 149 North, Range 97 West, Section 24
- Township 149 North, Range 97 West, Section 26
- Township 149 North, Range 97 West, Section 29
- Township 149 North, Range 97 West, Section 8
- Township 149 North, Range 97 West, Section 9

1.0 INTRODUCTION

As oil production in the Bakken Shale has exceeded 600,000 barrels a day (bbl/d), new infrastructure is required to provide safe and reliable transport of crude oil from oil wells to a larger outlet pipelines. The purpose of the CenterPoint Energy Bakken Crude Services, LLC (CEBCS) Bear Den Project (Project) is to construct a gathering pipeline system to eliminate tanker truck activity on public and private roads in the Project area. Currently, the subject wells are serviced through a system of temporary on-site storage, with transportation of crude oil and produced water accomplished by tanker truck via public and lease roads. Relative to continued trucking, gathering, and transportation via pipeline is more efficient, reliable, economic and environmentally conscious (i.e., transport via pipeline would reduce air emissions and minimize the potential for inadvertent releases). The crude oil pipeline system would have a total annualized average capacity of approximately 14,000 bbl/d, and the produced water pipeline system would have a total annualized average capacity of approximately 3,500 bbl/d.

Although the Project is currently designed and scoped to service the transportation needs of a single production company, it is possible that connections with additional or third-party wells could also be pursued in the future, which could result in the need for expanded or additional facility components. However, should future components be added to the system, CEBCS would first consult with and obtain the necessary permits and approvals from applicable local, state and federal agencies.

The proposed Project includes the construction and operation of a crude oil and produced water gathering system that would service multiple existing and/or proposed wells in Dunn and McKenzie Counties, North Dakota. Figure 1 in Appendix A depicts the general Project location.

The Project would be constructed and operated by CEBCS, which is a wholly owned subsidiary of CenterPoint Energy Field Services, LP (CEFS). CEBCS was created as a subsidiary to pursue crude oil gathering opportunities in the Bakken Shale region.

1.1 Purpose and Need for the Action

CEBCS submitted a Right-of-Way (ROW) Grant Application for the Project to the Bureau of Land Management (BLM), North Dakota Field Office, on July 17, 2012. The proposed project crosses approximately 13.9 miles of public land managed by the BLM North Dakota Field Office and the U.S. Forest Service (USFS), McKenzie Ranger District (Little Missouri National Grassland).

The Secretary of the Interior is authorized to grant rights-of-way (ROW) on public lands for pipelines to transport oil and gas under the authority of Section 28 of the Mineral Leasing Act of 1920, (MLA) as amended and supplemented, (30 United States Code (USC) 181 et seq.) and prescribed in 43 Code of Federal Regulations (CFR) Parts 2880 and 3160. The Need for this Proposed Action is established by the BLM's responsibility under MLA to respond to CEBCS' request to construct the pipeline on public lands.

The purpose and need for this action is to respond to the MLA ROW application submitted by CEBCS to construct, operate, maintain, and decommission crude oil and produced water pipelines and ancillary facilities on public lands administered by the USFS and the BLM in North Dakota, including an Environmental Assessment (EA) of the proponent's proposal and a reasonable range of alternatives to the proposal.

1.2 Decision to Be Made

The BLM is the lead agency for this EA and would decide whether or not to approve CEBCS' application for a ROW Grant and if so, under what terms and conditions. The cooperating agencies (USFS and U.S. Fish and Wildlife Service (FWS)) would have their own terms and conditions for portions of the pipeline and/or any facilities that would be installed on their property. The BLM would make a decision regarding whether or not to issue a ROW Grant, and under what conditions, after consultation with and agreement from the USFS.

1.3 Scoping, Public Involvement, and Issues

1.3.1 Scoping

Scoping was the primary mechanism used by the BLM to initially identify resources to be addressed in the EA. Internal scoping was initiated when the Project was presented at the interagency kick-off meeting held in Bismarck, North Dakota on August 29, 2012. The BLM determined that public scoping meetings would not be required for the project due to the limited effect that the project would have on public lands. On November 1, 2013, the BLM did issue a project notification and scoping notice soliciting public comment on the Project. That correspondence established a 30 day scoping period for the Project and indicated that comments on the Project should be submitted to the BLM by December 5, 2012 to ensure that they would be addressed in the EA. The scoping notice was sent to other affected federal, state and local agencies, all affected landowners, and over 200 other stakeholders and interested parties. Additionally, the BLM initiated formal consultation with 17 Native American Tribes concerning the project.

Issues received during the initial scoping period are included in Table 1.3.1-1 below.

TABLE 1.3.1-1

Bear Den Project
Initial Scoping Comments Received

Entity	Date Received	Substantive Comment On	Section Addressed
U.S. Fish and Wildlife Service	November 20, 2012	Threatened, Endangered, and Candidate Species	4.1.9
		Migratory Birds	4.1.11
		Bald and Golden Eagles	4.1.11
		Waterbodies, Including Wetlands	4.1.6
		Habitat Avoidance and Restoration	4.1.9.2
U.S. Army Corps of Engineers	November 28, 2012	Best Management Practices	Bear Den Plan of Development
		Water Quality Standards	4.1.5
		Fish and Wildlife Resources	4.1.13
		Section 404 of the Clean Water Act	4.1.6
North Dakota Department of Transportation	December 3, 2012	Pipeline Placement	2.1
Standing Rock Sioux Tribe	December 4, 2012	Cultural Inventory	4.1.14
North Dakota Game and Fish Department	December 5, 2012	Native Prairie and Wooded Draws	4.1.7
		Classified Fisheries	4.1.12
		Wetlands	4.1.6
		Bighorn Sheep Lambing Areas	4.1.9
		Golden Eagles	4.1.11

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

The Project pipeline system would receive crude oil at the subject wells and transport it to an aboveground facility for temporary storage and transfer to an outlet pipeline. Additionally, water produced at the subject wells would be transported to a third-party injection well for disposal. The project pipelines would generally be installed within a common ROW, with approximately 58.9 miles of ROW housing dual, collocated pipelines and approximately 10.2 miles of ROW housing a single crude or produced water pipeline.

Throughout the EA and associated appendices, the locations of specific features along the pipeline ROW are identified by a specific pipeline name (e.g., Line AR, Line AR-1, etc.) and milepost (MP) value.

Table 2.1-1 summarizes the Project's land requirements by Landowner.

TABLE 2.1-1

Bear Den Project
Project Land Requirements by Land Ownership

Land Ownership	Land Requirements		
	Temporary Construction Area (acres)	Permanent Easement or Facility Area (acres)	Total Disturbance (acres)
Crude Oil			
U.S. Forest Service (USFS)	42.3	70.3	112.6
North Dakota Trust Lands (NDTL)	61.3	26.2	87.4
Bureau of Land Management (BLM)	6.3	9.1	15.4
Private	345.9	293.0	639.0
Subtotal	**455.8**	**398.6**	**854.4**
Access Roads			
USFS	0.6	0.0	0.6
NDTL	0.1	0.2	0.3
BLM	0.0	0.3	0.3
Private	1.1	3.1	4.2
Subtotal	**1.8**	**3.7**	**5.5**
Aboveground Facilities/Lots			
Private	10.0	40.5	50.5
TOTAL PROJECT IMPACTS	**467.6**	**442.8**	**910.3**

2.1.1 Proposed Facilities and Design Features

The Project entails construction and operation of various pipeline and aboveground facilities, including:

- approximately 68.0 miles of 3- to 8-inch-diameter welded steel pipeline (i.e., the crude oil gathering pipeline system);
- approximately 0.5 mile of 8-inch-diameter welded steel pipeline (i.e., the crude oil delivery lateral pipeline; Line AR-16) that would extend from the storage/transfer facility and terminate at an interconnect with a third-party outlet pipeline (i.e., the BakkenLink Pipeline);
- approximately 59.4 miles of 3- to 6-inch diameter composite pipeline (i.e., the produced water gathering pipeline system);
- approximately 68.0 miles of fiber optic cable to be laid concurrently with the pipeline facilities and within the excavated pipeline trenches;

- a storage/transfer facility located at the terminus of Line AR, which would entail a fenced and graveled, approximately 40-acre site that would house:
  - an office building;
  - a shop/warehouse building;
  - an operations building containing control room, motor control center, and process equipment;
  - a heater/generator building;
  - various tanks, including
    - two, 20,000 barrel (bbl) crude oil storage tanks;
    - two, 500 bbl slop oil tanks;
    - two, 500 bbl tanks for storage of tank bottom water; and
    - one, 10,000 bbl fire safety water storage tank;
  - metering facilities for the measurement of incoming and outgoing crude oil;
  - a pig receiver and associated filter/separators for the crude oil gathering pipeline;
  - a pig launcher and three, approximately 50-horsepower (hp) electric pumps for the crude oil delivery lateral;
  - a 398-hp, diesel powered backup generator;
  - a 282-hp, diesel powered generator/pump set for the fire safety water system;
  - block valves for all pipelines; and
  - yard piping;
- a pig receiver assembly at the terminus of the crude oil delivery lateral pipeline (Line AR-16), which would be sited and constructed on a lot owned and developed by the third-party outlet pipeline);
- automated wellhead facilities at each of the 31 well pad sites to be serviced by the Project, with each wellhead facility typically including:
  - a Lease Automatic Custody Transfer (LACT) unit, which consists of oil measurement/metering and an electric, 100-hp pump (with provision for the addition of a future booster pump if system hydraulics and pressures dictate);
  - produced water measurement/metering and a 25-hp electric pump (with provision for the addition of a future booster pump if system hydraulics and pressures dictate);
  - pig launchers for both the crude oil and produced water gathering pipelines;
  - block valves for each pipeline; and
  - yard piping;
- a pig launcher and receiver site (Line AR at MP 0.0), which would entail a fenced and graveled, approximately 1.0-acre lot that would house:
  - pig launchers/receivers for the crude oil and produced water gathering pipelines;
  - automated block valves for the crude oil and produced water gathering pipelines; and
  - two skid-mounted meter houses (each measuring approximately 10-feet by 20-feet);

- an automated block valve site (Line AR-30 at MP 11.0), which would entail a fenced and graveled, approximately 1.0-acre lot that would house:
  - automated block valves for the crude oil and produced water gathering pipelines.
- 35 lateral pipeline interconnect sites at each of the gathering pipeline lateral interconnects, with each site being either fenced or barred, and including:
  - pig launchers/receivers for the crude oil and produced water gathering pipelines;
  - block and check valves for the crude oil and produced water gathering pipelines; and
  - a metering facility (located only at the interconnect of Line AR-29 [MP 2.2] and Line AR-30 [MP 5.5]), which will include two skid-mounted meter houses, each measuring approximately 10-feet by 20-feet;
- intermediate block valve sites (located at Line AR at MP 7.0, Line AR-14 at MP 0.4, and Line AR-30 at MP 1.2), with each fenced and graveled site measuring approximately 50- by 50-feet to 100- by 100-feet, and including automated block valves for the crude oil and produced water gathering pipelines; and
- associated ancillary facilities (e.g., cathodic protection test leads and ground beds, pipeline markers, etc.).

In addition to these facilities, CEBCS would also contract with a third-party electric service provider to obtain delivery of metered electric power to the storage/transfer facility. Although existing electric powerlines adjoin the western side of the facility lot, it would be necessary to construct approximately 300 feet of buried electric distribution line to provide power to the facility.

Communications between the master control center and the various automated valves and measurement points along the gathering system would be accomplished via installation of fiber optic communications equipment, which would entail the installation of approximately 68 miles of fiber optic communication line and associated infrastructure to allow for remote monitoring and control of the pipeline system. Use of fiber optic technology would eliminate the need for the installation of communications tower/s in association with the Project.

The fiber optic communication line would extend from the various well pad facilities to the control center at the storage/transfer facility. Installation of the fiber optic lines would not require additional excavation activities or land requirements, as the fiber optic lines would be laid concurrent with the pipeline facilities and within the excavated pipeline trenches. Armored fiber optic line would preferentially be laid within the produced water pipeline trench, but would be laid within the crude oil pipeline trench where only a single crude oil pipeline would be installed. At horizontal directional drill (HDD) locations a 1.5-inch-diameter polyvinyl chloride (PVC) conduit would be pulled through the bore along with the produced water pipeline (or crude oil line where only a single pipeline would be installed). Following conduit installation, the fiber optic line would be blown into place though the conduit. Small, aboveground fiber optic junction boxes would be installed at communication and splice points in the line, and these would be located at the planned aboveground facility locations (valve sites, lateral pipeline interconnects, etc.).

Produced water would generally flow south and east, terminating at a disposal well located approximately 0.5 miles south of AR-32 at MP 0.7. The injection/disposal well (Pelton 2-1 SWD) is wholly owned and operated by XTO Energy, Inc. and is a Class II injection well regulated by the North Dakota Industrial Commission, Department of Mineral Resources, Oil and Gas Division. The well was originally in oil and gas production service, but it was converted to an injection/disposal well on February 26, 2011.

Tables 2.1.1-1, 2.1.1-2, and 2.1.1-3 summarize the temporary and permanent land requirements that would be associated with the Project.

TABLE 2.1.1-1

Bear Den Project
Temporary and Permanent Land Requirements Associated with the Project's Pipeline Facilities

	Location		Land Requirements			
Facility/Segment	Milepost In	Milepost Out	Temporary Workspace	Permanent Easement	Additional Temporary Workspace	Landowner
AR/ARW	0.0	3.9	29.6	23.5	0.2	Private
AR	3.9	4.4	1.9	1.3	0.1	U.S. Forest Service (USFS)
AR	4.4	5.6	0.0	7.1	0.0	Private
AR	5.6	6.4	2.6	2.1	0.1	USFS
AR	6.4	6.4	0.0	0.0	0.0	Private
AR	6.4	7.0	4.2	2.2	0.0	North Dakota Trust Lands (NDTL)
AR	7.0	12.6	32.4	34.3	0.6	Private
AR-1/ARW-1	0.0	0.0	0.0	0.0	0.0	Private
AR-2/ARW-2	0.0	0.0	0.2	0.1	0.0	Private
AR-3/ARW-3	0.0	0.0	0.0	0.2	0.0	USFS
AR-4/ARW-4	0.0	0.1	0.6	0.4	0.0	Private
AR-5/ARW-5	0.0	0.1	1.2	0.8	0.0	Private
AR-6/ARW-6	0.0	0.2	1.0	0.9	0.0	Private
AR-7/ARW-7	0.0	0.2	1.2	0.9	0.0	Private
AR-8/ARW-8	0.0	0.2	1.0	1.0	0.0	Private
AR-9/ARW-9	0.0	0.2	1.5	1.0	0.0	Private
AR-10/ARW-10	0.0	0.2	1.7	1.2	0.0	Private
AR-11/ARW-11	0.0	0.2	0.7	1.2	0.0	USFS
AR-12/ARW-12	0.0	0.2	1.9	1.3	0.0	Private
AR-13/ARW-13	0.0	0.2	0.0	1.3	0.0	Private
AR-14/ARW-14	0.0	0.4	3.2	2.2	0.0	Private
AR-15/ARW-15	0.0	0.5	3.1	2.9	0.1	Private
AR-16	0.0	0.5	2.4	3.1	0.1	Private
AR-17/ARW-17	0.0	0.6	2.4	3.5	0.1	Private
AR-18/ARW-18	0.0	0.3	1.1	1.9	0.0	USFS
AR-18/ARW-18	0.3	0.9	5.0	3.4	0.0	Private
AR-19/ARW-19	0.0	1.0	7.0	5.8	0.1	Private
AR-20/ARW-20	0.0	0.0	0.0	0.1	0.0	Private
AR-20/ARW-20	0.0	0.3	0.4	1.8	0.2	Bureau of Land Management (BLM)
AR-20/ARW-20	0.2	0.2	0.0	0.0	0.4	Private
AR-20/ARW-20	0.3	1.0	4.4	4.3	1.3	Private
AR-21/ARW-21	0.0	0.5	3.4	2.9	0.1	Private
AR-21/ARW-21	0.5	0.6	0.6	0.8	0.0	BLM
AR-21/ARW-21	0.6	1.1	3.7	2.6	0.0	Private
AR-22/ARW-22	0.0	0.3	0.3	1.3	0.4	NDTL
AR-22/ARW-22	0.3	1.2	5.7	5.2	0.5	Private
AR-23/ARW-23	0.0	11.8	10.9	7.5	0.0	Private
AR-24/ARW-24	0.0	1.3	2.4	7.7	0.8	USFS
AR-25/ARW-25	0.0	0.4	3.5	2.3	0.0	Private
AR-25/ARW-25	0.4	0.9	1.6	3.2	0.4	USFS
AR-25/ARW-25	0.9	1.4	4.2	3.2	0.1	Private
AR-25/ARW-25	1.4	1.5	0.4	0.7	0.0	USFS
AR-25/ARW-25	1.5	1.5	0.1	0.0	0.0	Private
AR-25/ARW-25	1.5	2.1	4.4	2.3	0.1	NDTL

TABLE 2.1.1-1 (cont'd)

Bear Den Project
Temporary and Permanent Land Requirements Associated with the Project's Pipeline Facilities

	Location		Land Requirements			
Facility/Segment	Milepost In	Milepost Out	Temporary Workspace	Permanent Easement	Additional Temporary Workspace	Landowner
AR-25/ARW-25	2.1	2.4	2.7	1.0	0.0	NDTL
AR-25/ARW-25	2.4	2.7	4.1	1.5	0.0	NDTL
AR-25/ARW-25	2.7	2.9	0.6	0.8	0.0	Private
AR-25/ARW-25	2.9	3.1	0.8	1.7	0.1	USFS
AR-26/ARW-26	0.0	0.7	5.3	2.9	0.0	NDTL
AR-26/ARW-26	0.7	1.7	8.1	5.9	0.1	Private
AR-27/ARW-27	0.0	1.1	9.6	6.7	0.1	Private
AR-27/ARW-27	1.1	2.9	6.1	10.7	1.5	USFS
AR-27/ARW-27	1.2	1.2	0.0	0.0	0.0	Private
AR-28/ARW-28	0.0	4.1	35.1	24.7	0.3	Private
AR-29/ARW-29	0.0	0.3	2.1	1.7	0.1	Private
AR-29/ARW-29	0.3	0.5	0.9	1.6	0.0	BLM
AR-29/ARW-29	0.5	2.2	11.5	9.7	0.1	Private
AR-29/ARW-29	1.9	1.9	0.1	0.0	0.0	BLM
AR-30/ARW-36	0.0	2.1	15.4	13.0	0.2	Private
AR-30/ARW-36	2.1	2.8	6.6	2.6	0.1	NDTL
AR-30/ARW-36	2.8	3.5	5.7	2.7	0.3	NDTL
AR-30/ARW-30/36[a]	3.5	6.9	19.3	20.2	0.4	Private
AR-30/ARW-36	3.5	3.5	0.0	0.0	0.0	BLM
AR-30/ARW-30	6.9	6.9	0.0	0.0	0.0	BLM
AR-30/ARW-30	6.9	7.0	0.0	0.2	0.0	BLM
AR-30/ARW-30	7.0	7.7	1.3	4.4	0.2	Private
AR-30/ARW-30	7.7	8.2	6.2	2.2	0.0	NDTL
AR-30/ARW-30	7.7	7.7	0.0	0.0	0.9	NDTL
AR-30/ARW-30	8.2	8.9	7.7	2.8	0.0	NDTL
AR-30/ARW-30	8.9	9.0	0.3	0.2	0.0	Private
AR-30/ARW-30	9.0	9.3	1.2	1.8	0.0	BLM
AR-30/ARW-30	9.3	11.8	17.7	15.4	0.1	Private
AR-31/ARW-37	0.0	4.2	13.3	25.2	1.6	USFS
AR-31/ARW-31	4.2	4.4	0.8	1.5	0.0	Private
AR-31/ARW-31	4.4	4.9	1.7	3.1	0.1	USFS
AR-31/ARW-31	4.9	5.2	1.5	1.8	0.1	Private
AR-31/ARW-31	5.2	5.8	5.5	2.2	0.0	NDTL
AR-31/ARW-31	5.8	6.3	5.4	2.0	0.0	NDTL
AR-31/ARW-31	6.3	7.3	8.3	6.1	0.0	Private
AR-31/ARW-31	7.3	7.5	1.3	1.3	0.0	BLM
AR-31/ARW-31	7.5	8.2	5.5	4.3	0.0	Private
AR-31/ARW-31	8.2	9.3	7.1	6.7	0.0	Private
AR-31/ARW-31	9.3	9.5	1.4	1.5	0.0	BLM
AR-31/ARW-31	9.5	10.0	4.3	3.0	0.0	Private
AR-32/ARW-32	0.0	0.1	1.4	0.5	0.0	NDTL
AR-32/ARW-32	0.1	2.9	24.2	16.6	0.1	Private
AR-33/ARW-33	0.0	0.0	0.1	0.2	0.0	USFS
AR-34/ARW-34	0.0	3.0	23.3	17.9	0.6	Private
AR-35/ARW-35	0.0	1.0	2.1	6.3	0.3	USFS
AR-35/ARW-35	1.0	2.1	9.5	6.6	0.0	Private
AR-35/ARW-35	2.1	2.9	2.6	4.9	0.0	USFS
ARW-39	0.0	0.5	3.1	3.1	0.0	Private
Pipeline Total			**442.7**	**398.6**	**13.1**	

[a] Produced water pipeline ARW-36 extends from MP 0.0 to MP 5.5.

TABLE 2.1.1-2

Bear Den Project
Temporary and Permanent Land Requirements Associated with the Project's Aboveground Facilities

Lots and Yards	Location	Temporary Workspace	Permanent Workspace	Additional Temporary Workspace	Landowner
Bice Pipe Storage/Contractor Yard	Not applicable	5.02	0.00	0.00	Private
Dennis Pipe Storage/Contractor Yard	Not applicable	5.00	0.00	0.00	Private
Storage/Transfer Facility	AR-16 at MP 0	0.00	39.89	0.00	Private
Pig Launcher/Receiver Site	AR at MP 0.0	0.00	0.15[a]	0.00	Private
Line AR Intermediate Block Valve Site	AR at MP 7.0	0.00	0.03	0.00	Private
Line AR 14 Intermediate Block Valve Site	AR-14 at MP 0.4	0.00	0.00	0.00	Private
Line AR 30 Intermediate Block Valve Site	AR-30 at MP 1.2	0.00	0.00	0.00	Private
Block Valve Site	AR-30 at MP 11.0	0.00	0.41[a]	0.00	Private
Lots and Yards Total		**10.02**	**40.48**	**0.00**	

[a] Acreage for permanent workspace is in addition to the 50-foot permanent easement associated with the pipeline(s). This acreage is already included as part of land requirements identified in Table 2.1-1.

TABLE 2.1.1-3

Bear Den Project
Temporary and Permanent Land Requirements Associated with the Project's Access Roads

Access Road [a]	Location	Temporary Workspace	Permanent Workspace	Length	Landowner
CA1-AR	AR at MP 8.2	0.6	0.0	915	Private
CA2-AR	AR at MP 6.9	0.2	0.0	305	Private
PA1-AR-15	AR-15 at MP 0.4	0.0	0.1	131	Private
CA1-AR-19	AR-19 at MP 0.5	0.3	0.0	455	Private
CA1-AR-22	AR-22 at MP 0.5	0.3	0.0	384	Private
PA1-AR-23	AR-23 at MP 0.7	1.0	2.1	4,491	Private
PA1-AR-28	AR-28 at MP 4.1	0.0	0.1	110	Private
PA1-AR-30	AR-30 at MP 6.4	0.4	0.7	1,555	Private
PA2-AR-30	AR-30 at MP 4.5	0.1	0.1	275	Private
PA3-AR-30	AR-30 at MP 4.1	0.2	0.4	831	Private
PA4-AR-30	AR-30 at MP 2.4	0.2	0.4	877	Private
PA5-AR-30	AR-30 at MP 1.7	0.6	1.3	2,769	Private
PA1-AR-31	AR-31 at MP 7.3	0.0	0.1	157	Private
CA1-AR-31	AR-31 at MP 7.6	0.2	0.0	353	Private
CA1-AR-34	AR-34 at MP 2.4	0.6	0.0	812	Private
CA2-AR-34	AR-34 at MP 1.7	0.2	0.0	228	Private
CA3-AR-34	AR-34 at MP 0.5	0.1	0.0	185	Private
CA1-AR-35 [b]	AR-35 at MP 2.1	1.6	0.0	2,378	U.S. Forest Service
Access Roads Total		**6.7**	**5.1**		

[a] Note: Roads labeled as CA are for temporary construction access; roads labeled PA are for construction and permanent access to the Project.

[b] Use of road does not require construction or upgrades on USFS land. Timber mats would be placed over existing trail to facilitate temporary use.

2.2 No Action Alternative

Under the No Action Alternative, the existing wells would continue to be serviced through a system of temporary on-site storage, with transportation of crude oil and produced water accomplished by tanker truck via surface public and lease roads.

2.3 Alternatives Considered but not Carried Forward

The Proposed Action is the only feasible Alternative other than the No Action Alternative. Currently, based on the number of wells being serviced (31) for both produced water and crude oil, and the volume of production, on average, the existing wells require a total of 84 transport truck trips each day to collect the produced water and crude oil. The continued transfer of crude oil and water via truck would not reduce air emissions or minimize the potential for inadvertent releases relative to truck transport. The Preferred Alternative would be to transport crude oil and produced water via a new pipeline system, which would be more efficient, reliable, economic, and environmentally conscious. The Preferred Alternative would also reduce truck and associated vehicular traffic and noise throughout the area and reduce the need for road maintenance and traffic controls.

The Project Area does not contain an existing pipeline system that could be modified, upgraded, or otherwise utilized to meet the Project's objectives.

The Project did consider and adopt numerous minor route deviations in an effort to avoid and minimize effects to sensitive and rare habitats, wetlands, riparian areas, talus slopes, native grasslands, and cultural resources. The primary set of factors in determining areas to avoid were developed during consultations with the BLM, USFS, FWS, North Dakota Game and Fish Department (NDGFD), State Historic Preservation Office (SHPO), landowners, and other interested stakeholders, such as Tribal entities with an interest in the project.

In an effort to be consistent with the Migratory Bird Treaty Act (MBTA) of 1918, as amended, Executive Order (EO) 13186, and other BLM and USFS guidance documents, CEBCS has avoided and minimized impacts to specific sensitive habitats and other environmentally important areas (e.g., perennial waterbodies, wetlands, known lambing areas, sensitive plant species, historic properties, etc.) during the routing process. This process was informed by biological, cultural, and paleontological field surveys. The proposed ROW has been reconfigured and/or reduced to meet these objectives.

It is anticipated that minor alignment shifts would be required prior to and during construction to accommodate currently unforeseeable site-specific constraints related to engineering, landowner, and environmental concerns. If alignment shifts occur outside the previously environmentally surveyed corridor, new areas would be surveyed and all appropriate agencies would review and approve per pertinent permit and consultation requirements. All alignment shifts would be subject to review and approval by the BLM and USFS, as applicable, prior to construction at these locations.

Plan Conformance Review

The Proposed Action is subject to and has been reviewed for conformance with the BLM's planning regulations (43 CFR 1600) and Federal Code planning regulations (43 CFR 3420.1-4) and in accordance with the Council on Environmental Quality (CEQ) regulations for implementing the National Environmental Policy Act (NEPA), 40 CFR 1500:

Name of Plan: BLM North Dakota Resource Management Plan and Environmental Impact Statement

Date Approved: April 22, 1988

Name of Plan: USFS Land and Resource Management Plan (LRMP) for the Dakota Prairie Grasslands Northern Region

Date Approved: Revised 2001

3.0 AFFECTED ENVIRONMENT

Affected Resources

The CEQ Regulations state that NEPA documents "must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail" (40 CFR 1500.1(b)). While many issues may arise during scoping, not all of the issues raised warrant analysis in an EA. Issues would be analyzed if: 1) an analysis of the issue is necessary to make a reasoned choice between alternatives, or 2) if the issue is associated with a significant direct, indirect, or cumulative impact, or where analysis is necessary to determine the significance of the impacts. Table 3-1 lists the resources considered and the determination as to whether they require additional analysis.

TABLE 3-1

Bear Den Project
Resources and Determination of Need for Further Analysis

Determination [a]	Resource	Rationale for Determination
Physical Resources		
PI	Air Quality	Construction activities would involve vegetation removal, clearing of work surface, excavation of trenches and reclamation activities. During these construction phases dust production is likely, and emissions from vehicles would occur. Operational activities could include minor source emissions from tanks and combustion sources at the storage/transfer facility.
PI	Noise	Construction activities would involve a temporary increase in ambient noise levels from boring activities, machinery, and other vehicular operations. Operational activities from vehicular traffic and intermittent operation of backup generation at the storage/transfer facility could temporarily increase ambient noise levels.
PI	Geology and Minerals	Construction activities could impact slump prone areas in the Badlands. No impacts to active surface mines, or known lignite or uranium deposits are anticipated.
PI	Soil Resources*	Construction activities would require surface disturbance of soils, including on slopes greater than 17 percent
PI	Surface and Ground Water Quality	Construction activities could temporarily change natural surface water recharge patterns. Soil compaction from construction could lower absorption rates, increase sedimentation, surface runoff, and salt loading.
Biological Resources		
PI	Wetlands and Riparian Zones	Construction activities would require temporary disturbance and removal of vegetation in wetlands and riparian zones.
PI	Vegetation	Construction activities would require disturbance/removal of vegetation.
PI	Noxious Weeds and Invasive Species	Invasive species are present within the project area, and there is the potential for invasion of noxious weeds due to vegetation disturbance associated with the Proposed Action.
PI	Special Status Animal Species	A total of 27 special status animal species could occur in the Project area. Construction activities could cause temporary loss of habitat for special status birds and terrestrial mammal species. Human disturbance associated with construction activities may cause special status animals to temporarily utilize adjacent habitats.
PI	Special Status Plant Species	A total of 14 special status plant species could occur in the Project area. Construction activities could directly impact or cause temporary loss of habitat for special status plant species.
PI	Migratory Birds	The Project is located within 16 distinct habitat types within the Northern Great Plains Ecoregion (Level 3), which provide suitable habitat for migratory birds. Construction activities would be conducted during migratory bird nesting period and there could be a temporary loss of nesting habitat and bird nests.
PI	Aquatic Wildlife	In-stream construction activities are planned, so impacts to aquatic wildlife species could occur.
PI	Terrestrial Wildlife	Construction activities could cause temporary loss of habitat for terrestrial wildlife species. Disturbance associated with construction activities may cause terrestrial wildlife to temporarily utilize adjacent habitats.

TABLE 3-1 (cont'd)

Bear Den Project
Resources and Determination of Need for Further Analysis

Determination [a]	Resource	Rationale for Determination
Heritage Resources and the Human Environment		
PI	Cultural Resources	Cultural resources have been identified in the area.
PI	Tribal Treaty Rights and Interests	Consulting tribes have expressed interest and concern in the project area.
PI	Paleontological Resources	Construction activities could occur in areas with high to very high paleontological potential.
PI	Visual Resources	The Project is not located within a designated Visual Resource Management (VRM) unit; however, construction and permanent aboveground facilities could temporarily and permanently impact visual resources.
PI	Hazardous or Solid Wastes	The Project would require storage and handling of fuels and other hazardous materials.
NI	Fire Management	Bureau of Land Management (BLM) fire prevention plan to be implemented.
PI	Social and Economic Conditions	Construction activities could impact or change social or economic conditions within the Project area.
NP	Environmental Justice	According to the most recent Census Bureau statistics (2010), there are no minority or low income populations within the Project area that could be impacted by any environmental effects associated with the Project.
PI	Public Safety	Accidental spills, fire, and increased traffic from construction and operational activities could impact public safety.
Resource Uses		
NP	Forest Management	There are no forests in the Project areas.
PI	Land Use, Rangeland Management, and Recreation	Construction activities would impact the access or use of lands, including rangeland and recreation in the Project area.
PI	Access and Transportation	Construction activities would temporarily impact access and increase local traffic in the Project area.
NP	Prime and Unique Farmlands	There are no Prime and Unique Farmlands within the Project area.
Special Designations		
NP	Areas of Critical Environmental Concern	There are no areas of critical environmental concern in the vicinity of the Project area.
NP	Wilderness	No Wilderness or Wilderness Study Areas are present in the Project area.
NP	Wild and Scenic Rivers	There are no Wild and Scenic Rivers in the Project area.
NP	Scenic Byways	There are no Scenic Byways within the Project area.

* Public Land Health Standard

[a] NP = Not present in the area impacted by the Proposed Action or Alternatives. NI = Present, but not affected to a degree that detailed analysis is required. PI = Present with potential for impact analyzed in detail in the EA.

3.1 Air Quality

3.1.1 Affected Environment

Regional and local air quality is determined by pollutant concentrations in the atmosphere and generally is expressed in units of parts per million (ppm) or micrograms per cubic meter (µg/m3). In addition to pollutant concentrations, air quality may be determined by visibility measurements.

Regional air quality could be affected by natural events such as windstorms and wildfires, and larger emissions generating sources such as power plants, large manufacturing facilities, and transportation activities in urban corridors. There are various activities associated with the proposed Project which have the potential to impact local and regional air quality including: construction-related combustion emissions, clearing and grading activities, trench excavation, intermediate term stockpiling of topsoil and subsoil; the construction and use of unpaved access roads; and operational and maintenance activities.

Both long-term climatic factors and short-term weather fluctuations are considered part of the air quality resource as they control dispersion and affect ambient air concentrations. This section describes the existing air quality resource of the region and the applicable air regulations that would apply to the proposed Project and alternatives.

3.1.2 Regulatory Framework

3.1.2.1 Federal

The Clean Air Act (CAA) is the comprehensive federal law that regulates air emissions from stationary and mobile sources. Among other things, this law authorizes the Environmental Protection Agency (EPA) to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants (HAPs) (EPA, 2012). Provisions of the CAA that may be relevant to the Project include:

- Air Quality Permitting;
- New Source Performance Standards (NSPS);
- National Emission Standards for Hazardous Air Pollutants (NESHAPs)
- General Conformity Requirements; and
- Climate Change Regulations.

The EPA has set NAAQS for six principal pollutants called “criteria” pollutants, these standards are listed in Table 3.1.2-1. The proposed Project is located in an area considered in attainment for all NAAQS.

TABLE 3.1.2-1

Bear Den Project
National Ambient Air Quality Standards for Criteria Pollutants

Pollutant		Averaging Time	Level	Form
Carbon monoxide (CO)		8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead (Pb)		Rolling 3 month average	0.15 µg/m^3 [a]	Not to be exceeded
Nitrogen dioxide (NO_2)		1-hour	100 ppb	98th percentile, averaged over 3 years
		Annual	53 ppb [b]	Annual Mean
Ozone (O_3)		8-hour	0.075 ppm [c]	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle pollution (PM)	$PM_{2.5}$	Annual	15 µg/m^3	annual mean, averaged over 3 years
		24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur dioxide (SO_2)		1-hour	75 ppb [d]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		3-hour	0.5 ppm	Not to be exceeded more than once per year

[a] Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

[b] The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

[c] Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

[d] Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Air Quality Permitting

Some stationary sources of air pollution would be required to obtain permits prior to construction. The three types of requirements that a source may need to meet are:

- prevention of Significant Deterioration (PSD) permits that are required for new major sources or existing major sources making a major modification in an attainment area;
- non-attainment New Source Review (NSR) permits that are required for new major sources or existing major sources making a major modification in a non-attainment area; and; and
- minor source (non-PSD) permits.

Prevention of Significant Deterioration

PSD applies to new major sources or major modifications at existing sources for pollutants where the area in which the source is located is in attainment or unclassifiable with the NAAQS. Generally, major sources include those stationary facilities that emit 100 tons or more per year of a criteria air pollutant, or 10 tons per year of a single HAP, or 25 tons per year of any combination of HAPs. Regulated pollutants include compounds such as nitrogen oxides (NO_X), particle pollution (PM_{10}, $PM_{2.5}$), and volatile organics

compounds (VOCs). PSD allows for incremental increases to total air emissions in a given area, while preventing air quality from deteriorating to the levels set by the NAAQS.

The construction equipment associated with the Project is not considered part of a stationary source because no construction equipment would be in a single location for longer than 12 months. During operations, it is unlikely that the proposed Project would be considered a major source of emissions; therefore, the proposed Project is not subject to PSD regulations.

Federal Operating Permits

A Title V operating permit is a federally enforceable operating permit that major stationary sources of emissions are required to obtain. Whether a source meets the definition of "major" depends on the type and amount of air pollutants it emits and, to some degree, on the overall air quality in its vicinity. Facilities that emit lesser amounts of a regulated air pollutant may be considered major sources in areas that do not meet the NAAQS for a particular pollutant. It is not anticipated that the proposed Project would be required to obtain a Title V operating permit as it would likely not be considered a major source of emissions.

New Source Performance Standards

The EPA is given authority to develop NSPS within the CAA. Any new, modified, or reconstructed facility that is listed as a specific source category under 40 CFR Part 60.16 must comply with the regulation. The NSPS applicable to the Project include the following subparts of 40 CFR Part 60:

- Subpart A – General Provisions;
- Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units;
- Subpart Kb – Standards of Performance for Volatile Organic Storage Vessels; and
- Subpart IIII – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines.

National Emission Standards for Hazardous Air Pollutants

NESHAPs are stationary source standards for hazardous air pollutants (HAPs). HAPs are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. The NESHAPs applicable to the Project include the following subpart of 40 CFR Part 63:

- Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines.

General Conformity Rule

The General Conformity Rule ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state's plans to meet national standards for air quality. A conformity determination is required for each pollutant when the total of direct and indirect emissions caused by a federal action in a nonattainment or maintenance area would equal or exceed threshold quantities specified in 40 CFR, Parts 93.153(b) (1) and (2). There are no non-attainment or maintenance areas within the state of North Dakota; therefore the Proposed Project would not be subject to the General Conformity Rule.

Climate Change

Climate change is a process that has occurred throughout Earth's history due to natural variations, such as cyclical changes in the sun's energy reaching the Earth, and also to unusual natural events such as large volcanic eruptions that have caused significant and abrupt temporary climate change. However, recent studies indicate a discernible upward trend in global warming and other climate changes. Many of

these changes have been linked to anthropogenic (human-caused) activities that increase the atmospheric concentration of greenhouse gases (GHG) such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O) (BLM, 2010).

It is difficult to discern whether climate change already is affecting resources globally, let alone those in the regional or local vicinity of the Project. In most cases, there is little information about potential or projected effects of global climate change on specific resources. It is important to note that projected changes are likely to occur over timeframes ranging from several decades to a century. Therefore, many of the projected changes associated with climate change may not be measureable or discernible within the reasonably foreseeable future. Existing climate prediction models are global in nature; therefore, they are not accurate at the appropriate scale to estimate potential impacts of the climate change within the Project area and vicinity.

3.1.2.2 State

The North Dakota Department of Health (NDDH), Environmental Health Section, Division of Air Quality (the Department) enforces the state and federal air quality related laws for all of North Dakota. The Project may be required to obtain a permit to construct as well as a minor source operating permit from the State of North Dakota for operational activities.

In addition to federal regulations, the CAA provides states with the authority to regulate air quality within state boundaries. The State of North Dakota has enacted additional Ambient Air Quality Standards (AAQS) that are applicable to the project area. Below, Table 3.1.2-2 presents the AAQS for North Dakota.

TABLE 3.1.2-2

Bear Den Project
Ambient Air Quality Standards for North Dakota

Pollutant		Averaging Time	Level	Form
Carbon Monoxide (CO)		8-hour	9 ppm	Not to be exceeded more than once per year
		1-hour	35 ppm	
Lead (Pb)		Rolling 3 month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO_2)		1-hour	100 ppb	98th percentile, averaged over 3 years
		Annual	53 ppb	Annual Mean
Ozone (O_3)		8-hour	0.075 ppm	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particle Pollution (PM)	$PM_{2.5}$	Annual	15 µg/m^3	annual mean, averaged over 3 years
		24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		1-hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		3-hour	0.5 ppm	Not to be exceeded more than once per year
Hydrogen Sulfide (H_2S)		Instantaneous	10 ppm	Maximum instantaneous concentration not to be exceeded.
		1-hour	0.20 ppm	Not to be exceeded more than once per month.
		24-hour	0.10 ppm	Not to be exceeded more than once per year.
		3-month	0.02 ppm	Maximum arithmetic mean concentration averaged over three consecutive months.

Source: North Dakota Administrative Code, Title 33 Chapter 15

Existing Air Quality

Air quality in a given area is measured with ambient air quality monitors. In 2010 the Department operated seven air quality monitoring sites, gathering data to determine the ambient air quality throughout the state (NDDH, 2010). The Proposed Project is located entirely within the counties of Dunn and McKenzie. The ambient air quality background values for these counties are listed Tables 3.1.2-3 and 3.1.2-4.

TABLE 3.1.2-3

Bear Den Project
Dunn County Ambient Air Quality Background Values

Pollutant	Averaging Period	Year	First Maximum	Second Maximum	Actual Exceedances	EPA Site ID
NO_2	1-hour	2011	12	10	0	380250003
	Annual					
CO[a]	1-hour	2011	0.6 (ppm)	0.6 (ppm)	0	380171004
	8-hour	2011	0.4 (ppm)	0.4 (ppm)	0	380171004
SO_2	1-hour	2011	31 (ppb)	11 (ppb)	0	380250003
	24-hour	2011	2 (ppb)	2 (ppb)	0	380250003
PM_{10}	24-hour	2011	96 (ug/m^3)	74 (ug/m^3)	0	380250003
$PM_{2.5}$	24-hour	2011	17.1 (ug/m^3)	13.9 (ug/m^3)	N/A	38025003
	Annual					
O_3	1-hour	2011	0.06 (ppm)	0.06 (ppm)	0	380250003
	8-hour	2011	0.058 (ppm)	0.057 (ppm)	0	380250003

[a] CO measured at the Cass County monitor as this is the only active CO monitor in the state.

TABLE 3.1.2-4

Bear Den Project
McKenzie County Ambient Air Quality Background Values

Pollutant	Averaging Period	Year	First Maximum	Second Maximum	Actual Exceedances	EPA Site ID
NO_2	1-hour	2011	229	18	1	380530002
	Annual					
CO[a]	1-hour	2011	0.6 (ppm)	0.6 (ppm)	0	380171004
	8-hour	2011	0.4 (ppm)	0.4 (ppm)	0	380171004
SO_2	1-hour	2011	130 (ppb)	18 (ppb)	1	380530002
	24-hour	2011	8 (ppb)	6 (ppb)	0	380530002
PM_{10}	24-hour	2011	35 (ug/m^3)	30 (ug/m^3)	0	380530002
$PM_{2.5}$	24-hour	2011	29.3 (ug/m^3)	23.1 (ug/m^3)	N/A	380530002
	Annual					
O_3	1-hour	2011	0.327 ppm	0.065 ppm	1	380530002
	8-hour	2011	0.062 ppm	0.062 ppm	0	380530002

[a] CO measured at the Cass County monitor as this is the only active CO monitor in the state.

Climate

Regional Climate

North Dakota is considered to have a continental climate—cold winters and hot summers, low humidity, light rainfall, and much sunshine. Extremes in temperatures may also abound. The climate is the result of North Dakota's location in the geographic center of North America. There are few natural barriers on the northern Great Plains and the winds move freely across the plains and account for rapid changes in temperature (The Library of Congress, 2012). Table 3.1.2-5 below presents historical climate data by month for the Proposed Project area.

TABLE 3.1.2-5

Bear Den Project
Historical Climate Data – Period of Record: August 1, 1928 to March 31, 2012

Temperature	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	22.3	27.9	38.6	53.5	65.3	74.2	82.2	81.9	69.5	56.4	38.2	26.3	53.0
Average Min. Temperature (°F)	3.0	7.9	17.7	29.3	40.6	49.9	55.6	53.9	43.5	32.5	18.6	7.1	30.0
Average Total Precipitation (inches)	0.35	0.32	0.58	1.33	2.17	3.51	2.24	1.73	1.42	0.94	0.47	0.29	15.37
Average Total Snowfall (inches)	5.5	4.9	5.6	4.5	1.1	0.0	0.0	0.0	0.2	2.3	4.9	4.7	33.6
Average Snow Depth (inches)	5	5	4	1	0	0	0	0	0	0	1	2	1

Source: High Plains Regional Climate Center, 2012

3.2 Noise

3.2.1 Affected Environment

Sound is a sequence of waves of pressure that propagates through compressible media such as air or water. When sound becomes excessive, annoying, or unwanted it is referred to as noise.

Decibels (dB) are the units of measurement used to quantify the intensity of noise. To account for the human ear's sensitivity to low level noises the decibel values are corrected for human hearing to weighted values known as decibels of the A-weighted scale (dBA).

There are no regulations specifically related to the types of noise that would occur as a result of the Project within Dunn County, McKenzie County, nor the State of North Dakota. Table 3.2.1-1 shows the Occupational Safety and Health Administration (OSHA) permissible time limits for worker exposure at different sounds levels.

TABLE 3.2.1-1

Bear Den Project
Permissible Noise Exposures

Duration per Day (hours)	Sound Level Decibels of the A-weighted Scale (dBA) Slow Response
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Source: 29 Code of Federal Regulations (CFR) Part 1910.95

The Project would be constructed entirely through mountainous and rural areas of low population density where the nearest residences would be at least 3,800 feet from the ROW. Existing noise sources in mountainous and rural areas are predominantly natural (i.e., wind, birds, etc.). Other sources of noise in rural and agricultural areas are roadway traffic and farm equipment, and more recently crude oil development and associated activities, on a seasonal basis. A portion of the Project area is located near U.S. Highway 85, where vehicle traffic would also contribute to ambient noise conditions. Generally, background noise levels in rural areas range between 35 and 50 dB (EPA, 1974). The background level can be affected by atmospheric conditions, wind levels, topography, vegetation, time of day, bird, and human activity.

3.3 Geology, Minerals, and Hydrology

3.3.1 Affected Environment

The Project area would be located in the Great Plains physiographic province (Fenneman, 1928). In western North Dakota, the Great Plains is divided into two major sections, the Glaciated Missouri Plateau and the Unglaciated Missouri Plateau. The Missouri Plateau is a dissected plateau characterized by badlands, buttes and mesas, and exhumed mountain ranges such as the Black Hills. The glaciated area is generally of low relief as compared to the unglaciated area, which has more variety of landforms (Trimble, 1980). The Glaciated Missouri Plateau is covered by glacial deposits, but the boundary between the glaciated and non-glaciated sections is not distinct because the glacial deposits thin gradually.

The Project route would be located in the Glaciated Missouri Plateau and elevations range from less than 2,000 feet above mean sea level (amsl) at the Little Missouri River crossings to 2,400 feet amsl in the upland areas in McKenzie and Dunn Counties. A few miles north and south of the Little Missouri River crossing are the Little Missouri Badlands, a heavily dissected badland area caused by the post-glacial erosion of the Little Missouri River into upland areas (Carlson, 1983). South of the Little Missouri River crossing, the Project route would be in the Unglaciated Missouri Plateau where elevations range from 2,600 to 2,800 feet amsl.

The bedrock geology consists of the Bullion Creek, Sentinel Butte Formations of the Paleocene Fort Union Group, and the Eocene Golden Valley Formation. These formations are largely composed of claystone, siltstone, sandstone, and lignite. The Proposed Action would also cross unconsolidated Oahe silts and sands across several floodplains. There are very few exposures of bedrock along the Project route in McKenzie or Dunn Counties. North of Killdeer, North Dakota, the bedrock is mostly covered by glacially derived surficial deposits (Carlson, 1985, 1983; Freers, 1970). Glacial materials consist of till, lake deposits, and terraces and are composed of gravel, sand, and clay. The Project route would cross

the Sentinel Butte Formation southeast of Watford City, North Dakota except for occasional isolated erosion remnants of the Golden Valley Formation and Oahe floodplain alluvial deposits.

The Project area is be located in the Williston Basin, a major structural basin that covers northeastern Montana, most of North Dakota, and northwestern South Dakota (Peterson and McCary, 1987). The Williston Basin also extends north into Alberta, Saskatchewan, and Manitoba in southern Canada. The basin contains about 15,000 feet of Paleozoic through Tertiary sedimentary rock. The center of the basin is located in McKenzie County. The major structural feature near the Project area is the Nesson Anticline, a north-south trending structure near western McKenzie County (Gerhard et al., 1987). Other important subsurface features are the Billings Nose, a north-south anticlinal feature located primarily in Billings County and the Little Knife Anticline, located in western Dunn County.

Mineral Resources

The major mineral resources in the Project area are oil, natural gas, and lignite (Freers, 1970). The important non-fuel mineral resources are sand and gravel, clay, and scoria. Uranium deposits also occur in the area.

Oil and Gas

The Williston Basin is a major oil and gas producing basin; since 2008 more than 4,000 wells have been drilled in the Basin (U.S. Geological Survey [USGS], 2013). In the U.S. portion of the basin, total production from 1951 to the end of 2010 was approximately 2.9 billion barrels of oil and over 470 billion cubic feet of gas (Burke, 2006; Montana Board of Oil and Gas Conservation, 2011; North Dakota Division of Oil and Gas, 2011; South Dakota Oil and Gas Section, 2011). The first commercial oil well in North Dakota was drilled in Williams County on the Nesson Anticline in 1951, about 7.0 miles south of Tioga (Freers, 1970). The oil production decline in the 1990s has been offset in recent years by technological advances, which have allowed for increased production from the Bakken and Three Forks Formation. The USGS recent assessment found that the Bakken Formation has an estimated mean technically recoverable resource of 3.65 billion barrels of oil and the Three Forks Formation 3.73 billion barrels of oil (USGS, 2013). In addition to oil, these two formations are estimated to contain a mean of 6.7 trillion cubic feet of undiscovered, technically recoverable natural gas and 0.53 billion barrels of undiscovered, technically recoverable natural gas liquids (USGS, 2013). The Project route in McKenzie and Dunn Counties would generally parallel the axis of the Nesson Anticline where numerous oil and gas fields have been developed and is the epicenter of the current Bakken play in North Dakota. West of the Project route in Billings County, the Billings Nose has been the location of much oil and gas development since the 1970s and was the site of an initial horizontal Bakken play in the 1980s (Heck et al., 2000; Stroud and Sonnenberg, 2011). Bakken production has accounted for approximately 11 percent of total cumulative oil production in North Dakota. The Project would be located within 0.5 mile of 42 oil and gas-related production wells that are unaffiliated with the proposed Project.

Lignite

The Project area would be located in the Fort Union Coal region (Averitt, 1972). The lignite coal in the Project area is found in the Sentinel Butte Formation of the Fort Union Group. The Project route would cross areas that may contain economically minable coals (Murphy, 2005, 2006a, 2007a, 2008a,b). Based on consultations with the North Dakota Geological Survey (NDGS), bore data for this area is not publicly available; however, the Project does not cross any active or proposed lignite mines (2013). The Project is not within one mile of any active lignite mines.

Aggregate

Aggregate (sand and gravel) production is from localized deposits in floodplains or glacial deposits (Carlson, 1985, 1983; Freers, 1970). Some areas in McKenzie and Dunn Counties also have scoria deposits that are used for all-weather vehicular surfaces including road toppings, oil and gas well pads, and oilfield related development and production facilities. Scoria is formed from the in-situ burning of coal seams that result in baked rock. The Project is within one mile of five abandoned sand and/or aggregate mines.

Uranium

Uranium occurs in uraniferous lignite beds in Lower Tertiary rocks in western North Dakota including the Sentinel Butte and Golden Valley formations. Uraniferous lignites were mined in the area during the 1950s and 1960s (Murphy, 2007b). Often mining of lignite was accomplished by stripping the overburden and burning the lignite in place and shipping the ash off-site for further refinement, or shipping the lignite to a reduction facility southeast of Belfield, North Dakota. Generally there was no reclamation and only a few of the mined areas have been reclaimed under the North Dakota Abandoned Mine Lands program (North Dakota PSC, 2011). In the modern resurgence of uranium exploration and mining, the uraniferous lignites would not be considered commercially viable, but a potential resource exists in sandstones that could be mined by using *in situ* methods. From Fairfield to just north of Belfield, North Dakota, the Project route is approximately 4.5 miles north/northwest of an area defined by Murphy (2007b, 2006b) as a "uranium deposit" based on exploration boring logs, and uranium bearing zones could be as shallow as 1 foot from the surface to 500 feet deep. There are no active or abandoned mines within one mile of the Project area.

Seismic Hazards

There are three major phenomena associated with seismic hazards: faults, seismicity, and ground motion. The following describes the potential for seismic hazard occurrence in the Project area.

<u>Faults</u>

Faults are dislocations whereby blocks of earth material on opposite sides of the faults have moved in relation to one another. Rapid slippage of blocks of earth past each other can cause energy to be released, resulting in an earthquake. There is evidence of fault offset in older strata underlying the surficial cover, but no evidence that would lead to a conclusion of movement on the faults in the last 10,000 years. No active faults have been identified in the Project area (Crone and Wheeler, 2000). An active fault is one in which movement can be demonstrated to have taken place within the last 10,000 years (USGS, 2009).

Ground motion hazards result when the energy from an earthquake is propagated through the ground. The USGS ground motion hazard mapping indicates that potential ground motion hazard in the Project area is low. The hazard map used estimates peak ground acceleration expressed as a percentage of the acceleration of gravity with a 2 percent probability of exceedance in 50 years (Peterson et al., 2008).

Liquefaction

Soil liquefaction is a phenomenon often associated with seismic activity in which saturated, non-cohesive soils temporarily lose their strength and liquefy (i.e., behave like viscous liquid) when subjected to forces such as intense and prolonged ground shaking. Areas susceptible to liquefaction may include soils that are generally sandy or silty and are generally located along rivers, streams, lakes, and shorelines or in areas with shallow groundwater. Soil conditions necessary for liquefaction to occur would likely be present in the Project area (e.g., areas adjacent to the Little Missouri River). However, due to the low potential for a seismic event that would cause strong and prolonged ground shaking, the potential for soil liquefaction to occur is very low.

Subsidence

The major cause of concern regarding subsidence is historical mining of lignite. Lignite has been mined in the Project area for many years and before modern surface mining methods were employed that involve stripping off the overburden, backfilling, and reclamation, lignite was mined by room-and-pillar underground methods. Because the overburden was thin (often less than 50 feet), underground voids would collapse to the surface creating sinkhole-type subsidence, fissures, and unstable ground conditions.

Landslides

Landslide is a term used for various processes involving the movement of earth material down slopes (USGS, 2004). Landslides can occur in a number of different ways in different geological settings. Large masses of earth become unstable and, by gravity, begin to move downhill. The instability can be caused by a combination of steep slopes, periods of high precipitation, undermining of support by natural processes (stream erosion), or unintentional undercutting or undermining the strength of unstable materials in the construction of roads and structures.

Along the Project route, there are landslide-prone areas on either side of the Little Missouri River crossings (Murphy, 2004a, b, 2003). At both the Little Missouri River crossings, Sentinel Butte Formation bedrock is exposed and has been eroded into badland topography creating an unstable situation. Additionally, bentonite layers that may be exposed also contribute to instability, especially during periods of high precipitation.

3.4 Soil Resources

3.4.1 Affected Environment

The classifications of soils that may be impacted by the Proposed Action are shown in Table 3.4.1-1, which identifies important soils characteristics for each soil type.

The Project area is located within the following major land resource areas (MLRAs) of soil resources U.S. Department of Agriculture (USDA, 2006):

- MLRA 54 – Rolling Soft Shale Plain; and
- MLRA 58C – Northern Rolling High Plains, Northeastern Part.

MLRA 54 is predominantly unglaciated, but the eastern and northern edges have been glaciated. The area is located on an old, moderately dissected, rolling plain with some local badlands, buttes, and isolated hills. Terraces are adjacent to broad floodplains along most of the major drainages. Elevation ranges from 1,650 feet amsl in the east with a gradual slope to about 3,600 feet amsl in the west. The soils generally formed in residuum and alluvium from sedimentary parent materials. They are shallow to very deep, generally somewhat excessively drained to moderately well drained, and loamy or clayey. The dominant soil orders in this MLRA are Mollisols and Entisols. Mollisols are fertile soils with high organic matter and a nutrient-enriched, thick surface. In contrast, Entisols are considered recent soils that lack soil development because erosion or deposition rates occur faster than the rate of soil development.

TABLE 3.4.1-1

Bear Den Project
Soil Classifications That Would be Crossed by the Project

Pipeline Segment	Hydric [a]	Compaction Prone [b]	Water Erodible [c]	Wind Erodible [d]	Stony Surface [e]	Stony Profile [e]	Hard Bedrock [f]	Soft Bedrock [f]	Droughty [g]	Revegetation Concerns [h]
AR/ARW	--	--	7.56	0.15	0.37	0.47	--	7.93	0.15	6.02
AR-1/ARW-1	--	--	0.01	--	--	--	--	0.01	--	0.01
AR-2/ARW-2	--	--	0.03	--	--	--	--	0.03	--	0.03
AR-3/ARW-3	--	--	0.04	--	--	--	--	0.00	--	0.00
AR-4/ARW-4	--	--	0.10	--	--	--	--	0.08	--	0.10
AR-5/ARW-5	--	--	0.04	--	--	--	--	--	--	--
AR-6/ARW-6	--	--	0.20	--	--	--	--	0.06	--	0.20
AR-7/ARW-7	--	--	0.11	--	--	--	--	0.02	--	0.02
AR-8/ARW-8	--	--	0.20	--	--	--	--	0.16	--	0.20
AR-9/ARW-9	--	--	0.20	--	--	--	--	0.17	--	0.08
AR-10/ARW-10	--	--	0.20	--	--	--	--	0.16	--	0.20
AR-11/ARW-11	--	--	0.20	0.01	--	--	--	0.13	0.01	0.20
AR-12/ARW-12	--	--	0.20	--	--	--	--	0.20	--	0.20
AR-13/ARW-13	--	--	0.20	--	--	--	--	0.16	--	0.20
AR-14/ARW-14	--	--	0.20	--	--	--	--	0.06	--	0.20
AR-15/ARW-15	--	--	0.20	--	--	--	--	0.08	--	0.20
AR-16	--	--	0.05	--	--	--	--	--	--	--
AR-17/ARW-17	--	--	0.06	--	--	--	--	0.05	--	0.06
AR-18/ARW-18	--	--	0.90	0.08	--	--	--	0.60	0.08	0.90
AR-19/ARW-19	--	--	1.00	--	--	--	--	0.40	--	1.00
AR-20/ARW-20	--	--	0.86	--	--	--	0.02	0.59	--	0.71
AR-21/ARW-21	--	--	0.76	--	--	--	0.05	0.67	--	0.71

TABLE 3.4.1-1 (cont'd)

Bear Den Project
Soil Classifications That Would be Crossed by the Project

Pipeline Segment	Hydric [a]	Compaction Prone [b]	Water Erodible [c]	Wind Erodible [d]	Stony Surface [e]	Stony Profile [e]	Hard Bedrock [f]	Soft Bedrock [f]	Droughty [g]	Revegetation Concerns [h]
AR-22/ARW-22	--	--	1.19	--	--	--	--	0.72	--	1.19
AR-23/ARW-23	--	--	0.82	--	--	--	--	0.49	--	0.76
AR-24/ARW-24	--	--	1.28	0.22	--	--	--	0.96	0.22	1.28
AR-25/ARW-25	--	--	2.36	0.18	--	--	--	1.37	0.18	2.16
AR-26/ARW-26	0.47	0.47	0.94	--	--	--	--	0.58	--	0.82
AR-27/ARW-27	--	--	2.90	0.01	--	--	--	1.90	0.01	2.90
AR-28/ARW-28	--	--	4.01	0.02	--	--	0.04	3.39	0.02	3.52
AR-29/ARW-29	--	--	2.18	--	--	--	0.07	1.37	--	2.09
AR-30/ARW-30 and ARW-36	0.25	0.07	8.16	0.29	--	--	0.06	5.31	0.29	6.64
AR-31/ARW-31 and ARW-37	0.18	--	6.84	1.20	--	--	--	3.20	1.20	5.73
AR-32/ARW-32 and ARW-39	--	--	2.87	--	--	--	0.08	2.68	--	2.36
AR-33/ARW-33	--	--	0.03	--	--	--	--	0.01	--	0.03
AR-34/ARW-34	--	--	2.95	--	--	--	--	1.77	--	2.95
AR-35/ARW-35	--	--	2.13	0.17	--	--	--	1.62	0.17	2.13
Total (acres)	**0.90**	**0.54**	**51.98**	**2.34**	**0.37**	**0.47**	**0.32**	**36.94**	**2.34**	**45.80**

[a] As designated by the NRCS. Some soils that would be crossed by the project traverse multiple soil types in a single area.
[b] Includes soils in somewhat poor, poor, and very poor drainage classes with surface textures of sandy clay loam or finer.
[c] Includes land in capability subclasses IVe through VIIe and soils with an average slope greater than or equal to 9 percent.
[d] Includes soils in wind erodibility groups 1 and 2.
[e] Includes soils that have either: 1) a very gravelly, extremely gravelly, cobbley, stony, bouldery, or shaly modifier to the textural class, or 2) have >5 percent (weight basis) of rock fragments larger than 3 inches in the surface layer or any layer throughout the profile.

TABLE 3.4.1-1 (cont'd)

Bear Den Project
Soil Classifications That Would be Crossed by the Project

Pipeline Segment	Hydric [a]	Compaction Prone [b]	Water Erodible [c]	Wind Erodible [d]	Stony Surface [e]	Stony Profile [e]	Hard Bedrock [f]	Soft Bedrock [f]	Droughty [g]	Revegetation Concerns [h]

[f] Includes soils that have bedrock within 60 inches of the soil surface. Hard refers to lithic (unweathered) bedrock that may require blasting or other special construction techniques during installation of the proposed pipeline. Soft refers to paralithic (weathered) bedrock that would not likely require blasting during construction.

[g] Includes coarse-textured soils (sandy loams and coarser) that are moderately well to excessively drained.

[h] Includes soils that: 1) are coarse-textured (sandy loams and coarser) and moderately well to excessively drained and/or 2) have an average slope greater than 8 percent. Soils that are included in this category have considerable overlap with other soil types listed in this Table.

TABLE: 3.4.1-2

Bear Den Project
Acres[a] of Sodic and Saline Soils That Would be Crossed by the Project

Pipeline Segment	Sodic Soils (acres)	Saline Soils (acres)
AR/ARW	0.30	13.48
AR-5/ARW-5	0.30	0.30
AR-23/ARW-23	0.90	0.90
AR-25/ARW-25	--	0.30
AR-26/ARW-26	1.82	1.82
AR-30/ARW-30 and ARW-36	15.15	15.15
AR-31/ARW-31 and ARW-37	8.33	9.39
Total Acres	**26.81**	**41.36**

[a] Miles of sodic and saline soils in this table have been included in the total acreage of soils calculated in Table 3.4.1-1 and are not in addition to Table 3.4.1-1 due to similar soil types along the Project area.

MLRA 58C has some glacially modified topography, but it is very similar to the unglaciated parts. This MLRA is known as the Little Missouri Badlands, which were formed when the Little Missouri River was diverted along a steeper course by Pleistocene glaciers. The MLRA is an area of old plateaus and terraces that have been cut by the Little Missouri River and its tributaries. Much of the area consists of rolling hills with some badlands. Moderately steep and steep slopes occur along the Little Missouri River and its tributaries. Some isolated mountains, such as the Killdeer Mountains, are in the area. Elevation generally ranges from 1,970 to 3,280 feet amsl. The soils generally formed in tertiary marine sediments consisting of shale, siltstone, and sandstone. The dominant soil orders in this MLRA are Entisols, Inceptisols, and Mollisols. Inceptisols are weakly developed soils that formed in humid and subhumid regions. Inceptisols have altered horizons that have lost bases or iron and aluminum but retain some weatherable minerals. They are shallow to very deep, generally well drained, and loamy.

Soil types that would be crossed by the Project are discussed below.

Water erosion is the detachment and movement of soil by water. Natural erosion rates depend on inherent soil properties, slope, soil cover, and climate. Approximately 68 percent of the soils crossed by the Project route are highly erodible to water. Wind erosion is the physical wearing of the earth's surface by wind. Wind erosion removes and redistributes soil. Small blowout areas may be associated with adjacent areas of deposition at the base of plants or behind obstacles, such as rocks, shrubs, fence rows, and roadbanks (Soil Quality Institute, 2001). Wind erodible soils comprise approximately 4 percent of the soils crossed by the Project route.

Soil compaction occurs when soil particles are pressed together and the pore spaces between them are reduced and bulk density is increased. Moist fine textured soils are most susceptible to severe compaction. Approximately 2 percent of the soils crossed by the Project route are compaction prone.

Soils that are droughty have physical characteristics that may limit plant growth due to low water holding capacity. In addition, the success of stabilization and restoration efforts in these areas may be limited unless additional treatments and practices are employed to offset the adverse physical characteristics of the soils. Approximately 4 percent of the soils crossed by the Project route are considered droughty.

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part of the soil profile. These soils are commonly associated with floodplains, lake plains, basin plains, riparian areas, wetlands, springs, and seeps. Approximately one percent of the soils crossed by the Project route have at least one component of the map unit that is hydric. Smaller areas of hydric soils may exist but may not be captured due to the scale of mapping.

Soils with a shallow depth to bedrock include those that have lithic (hard) unweathered bedrock and paralithic (soft) weathered bedrock less than 60 inches from the soil surface. These conditions can be an important consideration for trenching techniques and/or the need for blasting. Approximately 54 percent of the soils crossed by the Project route have a shallow depth to bedrock, primarily of the paralithic type.

Saline soils have a high salt content. Sodic soils have a high sodium content. Saline and sodic soils are present in North Dakota because the underlying sodium-rich shale is present in the bedrock below the soil sediments. The severity of soil salinity or sodicity occurs where there is shallow saline or sodic groundwater table. Groundwater tables that average about six feet or less in depth are highly susceptible to salinity or sodicity development. A high salt content of the soil limits the ability of plant roots to absorb soil water even under wet conditions causing drought-like symptoms in the plants. Sometimes a white crust is visible on a saline soil surface. If a soil is sodic, a brownish-black crust sometimes forms on the surface due to dispersion of soil organic matter. Dispersion of soil particles (due to the formation of sodium carbonate salts) also results in crushing and impaired drainage which leads to poor soil physical structure. Poor soil physical structure results in soils difficult to till, poor seed germination and restricted plant root growth. Due to poor physical soil structure, sodic soils are susceptible to wind and water erosion.

3.5 Surface and Ground Water Quality

3.5.1 Affected Environment

Surface Water

The Project area lies within the Missouri Plateau portion of the Great Plains Province (Thornbury, 1965). As identified by the USGS Hydrologic Unit Codes (HUCs), the Project area is located within the Lower Little Missouri River 8-Digit HUC (10110205) sub-basin Watershed (HUC 10110205) (Natural Resources Conservation Service (NRCS), 2008). The sub-basin is part of the Missouri Region, Missouri-Little Missouri Sub-Region and Little Missouri Basin. All drainage patterns flow into the Little Missouri River, which flows into Lake Sakakawea (NRCS, 2008). Neighboring primary watersheds include Lake Sakakawea (HUC 10110101) to the north and Knife River (HUC 10130201) to the southeast. A number of waterbodies, which include major river courses as well as intermittent and perennial streams, also occur along the proposed Project route. In addition to these numerous water features, wetlands and floodplains occur within the Project area and are discussed in Section 3.6.

Mean annual precipitation in the Project area is approximately 14 inches, with approximately 10.5 to 11 inches falling from April to September (Jensen, no date). Streamflow results from precipitation accompanied by groundwater discharge as influenced by evapotranspiration, soils, and topography. Although streamflows vary seasonally and from year to year, sustained flows and the largest volumes generally occur in spring and early summer as a result of snowmelt, rainfall on melting snow, or intense

rainfall on saturated soils. More localized, short-duration peak flows and flooding may result from thunderstorms. July is the peak month for thunderstorm activity, but thunderstorms also occur nearly as frequently in June or August. Precipitation events totaling more than 0.5 inch in depth over a 24-hour period occur on average approximately 8 days per year at Watford City (Jensen, no date).

A waterbody survey along the proposed Project corridor and other required workspaces was conducted by Western EcoSystem Technologies, Inc. (WEST) from August 28-October 9, 2012. The survey corridor was 200-feet-wide along the proposed Project centerline (100 feet either side of centerline), 25 feet either side of proposed access roads, and within the storage/transfer facilities and other ancillary facilities. Based on the survey results, a total of 65 waterbodies were mapped within the survey corridor; however, no waterbodies were mapped and described within the proposed pipe storage/contractor yards (Bice or Dennis yard). In addition to the 65 waterbodies, WEST documented the presence of two springs within the survey corridor. Aside from the Little Missouri River, the primary perennial streams crossed by the proposed Project route include Cherry Creek, Bear Creek, Big Gulch, Cottonwood Creek, Deep Creek, and Lost Bridge in the Burnt Creek Watershed; Elkhorn Creek, Rough Creek, and Spring Creek in the Cherry Creek Watershed; and Lower Crosby Creek in the Crosby Creek Watershed. A number of named and unnamed intermittent streams also would be crossed by the proposed Project route. Stream crossings within the Project area are listed in the 2012 Waterbody Survey Report prepared by WEST.

Water quality reporting requirements under Sections 305(b) and 303(d) of the Clean Water Act require states to assess the extent to which lakes, reservoirs, rivers, and streams are meeting water quality standards applicable to their waters, including beneficial uses as defined in their state water quality standards. North Dakota's water quality standards provide for four stream classes: I, IA, II, and III, but excludes wetlands. The NDDH collects water quality data on major water bodies including the Lower Little Missouri River which is designated a Class II stream (NDDH, 2011). The water quality for this class of use "shall be the same as the quality of Class I streams, except that additional treatment may be required to meet the drinking water requirements of the department. Streams in this classification may be intermittent in nature, which would make these waters of limited value for beneficial uses such as municipal water, fish life, irrigation, bathing, or swimming" (North Dakota Administrative Code [NDAC] 33-16-02.1-09).

The other tributaries along the proposed Project route are designated as Class III streams (NDDH, 2010a). The water quality for this class of use "shall be suitable for agricultural and industrial uses. Streams in this class generally have low average flows with prolonged periods of no flow. During periods of no flow, they are of limited value for recreation and fish and aquatic biota. The quality of these waters must be maintained to protect secondary contact recreation uses" (e.g., wading), fish and aquatic biota, and wildlife uses" (NDAC 33-16-02.1-09).

In compliance with EPA requirements promulgated through the CWA, the NDDH issues a bi-annual integrated report on surface water quality in the state. Under Section 303(b) of the act, waterbodies with known water quality characteristics that fail to support designated uses are listed as impaired. Within the Project area, impaired waters and those with water quality characteristics that threaten the support of designated uses include the Little Missouri River from U.S. Highway 85 downstream to its confluence with Cherry Creek in McKenzie and Dunn Counties (due to fecal coliform) (NDDH, 2010a).

Groundwater

An evaluation of hydrogeologic resources in the Project area was conducted by NRG through review of publications and public Geographic Information System databases provided by the EPA, the USGS, the NRCS, and the NDDH. There are three glacial drift aquifers (Little Missouri River, Cherry Creek, and Tobacco Garden), underlying the Lower Little Missouri River sub-basin. Thirteen production areas are located in the sub-basin; two in Dunn County and eleven in McKenzie County (NRCS, 2008).

No sole-source aquifers are designated in North Dakota. Aquifers in or near the Project area occur within unconsolidated glacial and alluvial deposits and porous sedimentary bedrock. In central eastern McKenzie County, aquifers consist mainly of sand and gravel within ancient buried alluvial or glacial

outwash channels (Klausing, 1979; Croft, 1985). Major ancient alluvial or glacial outwash aquifers potentially crossed or adjacent to the proposed Project route include the Little Missouri River aquifer in southeastern McKenzie County. In addition to these features, less extensive surficial aquifer zones occur in recent alluvial deposits along the wider streams and rivers listed.

In McKenzie County, the Little Missouri River Aquifer is a narrow deposit consisting mainly of glacial outwash in the river valley (Croft, 1985). The aquifer consists of buried sand and gravel deposits approximately 0.75 mile wide. Thickness of the waterbearing zone generally is 150 feet, ranging as wide as 175 feet near Theodore Roosevelt National Park (Croft, 1985). The aquifer generally is considered to be approximately 22 feet deep under surficial silt loams, silts, and clays. Samples collected from the Little Missouri River aquifer contained large amounts of dissolved solids. Sodium dominated other constituents along with sulfate (Croft, 1985). Dissolved-solids concentrations ranged from 1,620 to 4,310 mg/L, with a median concentration of 2,330 mg/L (Croft, 1985).

Deeper bedrock aquifers in McKenzie County include the Late Cretaceous Fox Hills and basal Hell Creek systems, which underlie all of McKenzie County and extend into adjoining counties. This aquifer system generally is 1,100 to 1,800 feet below land surface. Water in the Fox Hills and basal Hell Creek aquifer system is a soft, sodium bicarbonate type. The water is not suited to irrigation use due to elevated sodium contents; however, it may be suitable for most domestic, livestock, and industrial uses (Croft, 1985).

3.6 Wetlands and Riparian Zones

3.6.1 Affected Environment

Waterbodies crossed by the Project include intermittent and ephemeral drainages that were classified as wetlands during the surveys conducted by WEST between August 28 and October 9, 2012. Some of these wetland features are associated with the intermittent drainages that direct water to the Little Missouri River. Most of the wetlands found within the Project area are either temporarily or seasonally flooded, Palustrine Emergent (PEM) wetlands according to the Cowardin Wetland Classification (Cowardin et al., 1979).

As described in the Bear Den Project 2012 Wetland Survey Report (WEST, 2012), National Wetland Inventory (NWI) data was used to conduct preliminary routing and planning, followed by a wetland survey to field-proof the NWI data along the proposed Project centerline and associated infrastructure and facilities to more accurately identify the wetlands that could be affected during project construction. Wetlands were delineated in accordance with the 1987 *U.S. Army Corps of Engineers Wetland Delineation Manual* (U.S. Army Corps of Engineers [COE], 1987), along with additional information provided in the *Great Plains Supplement* (COE, 2008). A total of 108 wetlands were identified and delineated within the Project survey boundaries which included the centerline, access roads, proposed wellhead facility locations, storage/transfer facility, and other ancillary facilities. No wetlands were delineated within the proposed storage/transfer facility, the Brice Contractor Yard, the Dennis Contractor Yard or any of the aboveground facility locations.

The vegetative composition within PEM wetlands is dependent on hydrology, salinity, and dynamics, specifically grazing and cultivation. Vegetation generally occurs in a concentric pattern from a wetter center area dominated by spike rush (*Eleocharis species*). A drier ring of foxtail or wild barley (*Hordeum jubatum*) and an outer margin of western wheatgrass (*Pascopyrum smithii*) or thickspike wheatgrass (*Elymus lanceolatus*) may also be present unless cultivated. The wettest wetland types, where water stands into or through summer, are typically characterized by hardstem bulrush (*Schoenoplectus acutus*), often occurring as a near monoculture, or fringed with soft stem bulrush (*Schoenoplectus tabernaemontani*) or common three-square bulrush (*Schoenoplectus pungens*) along drier margins. Cattails (*Typha* species) are also seen in these wetter systems, although they are typically a minor component. During spring or in permanently flooded sites, aquatic buttercups (*Ranunculus* species), aquatic smartweeds, pondweeds (*Potamogeton* species), or duckweeds (*Lemna* species) may also be common.

In addition to the PEM wetlands, two Palustrine Scrub-Shrub (PSS) wetlands[1] and three Palustrine Forested (PFO) wetlands[2] were also delineated. Vegetation within the PSS wetlands consisted of small tree and shrub dominated vegetation such as narrowleaf willow (*Salix exigua*). The PFO wetlands were found along the Little Missouri River as well as a small woodland depression in Dunn County. Green ash (*Fraxinus pennsylvanica*) was the predominant vegetation type at these two locations.

3.7 Vegetation

3.7.1 Affected Environment

The Project area is located entirely within the Little Missouri Badlands and Missouri Plateau regions of the Northwestern Great Plains ecoregion of west-central North Dakota. The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations and minimal wetland basins. The Project is situated within the Badlands Geographic Area and the Rolling Prairie Geographic Area (USFS, 2001). The dominant vegetation within the Badlands Geographic Area includes riparian cottonwood (*Populus spp.*) forests along the Little Missouri River, hardwood draws of green ash (*Fraxinus pennsylvanica*) and chokecherry (*Prunus virginiana*), uplands of western wheatgrass (*Pascopyrum smithii*) and needle and thread grass (*Hesperostipa comata*), rolling grasslands of western wheatgrass and prairie Junegrass (*Koeleria macrantha*), rocklands of common juniper (*Juniperus communis*) and creeping juniper also known as creeping cedar (*Juniperus horizontalis*), terraces of buffaloberry (*Sheperdia argentea*) and silver sagebrush (*Artemisia cana)*, savanna of green needlegrass (*Stipa viridula*), upland breaks of big sage (*Artemisia tridentata*) and skunkbrush (*Rhus trilobata*), river breaks of Rocky Mountain juniper (*Juniperus scopulorum*) and silver sagebrush, and toe slopes of western wheatgrass and prickly pear (*Opuntia spp.*)(USFS, 2001). The dominant vegetation within the Rolling Prairie Geographic Area includes hardwood draws of green ash and chokecherry, uplands of blue grama (*Bouteloua gracilis*) and little bluestem (*Schizachyrium scoparium*), rolling grasslands of western wheatgrass and prairie Junegrass, and terraces of buffaloberry and silver sagebrush (USFS, 2001).

Vegetation cover types and characterizations were compiled using North Dakota GAP Analysis Project data. Within the Project area, the six dominant vegetation communities that occur along the proposed pipeline ROW and associated infrastructure include grassland, agriculture, wetland and open water, developed lands, forest and woodland, and shrubland. Distribution and composition of each vegetation cover type varies based on landscape position, soil type, climatic conditions, moisture, elevation, aspect, and grazing and land management practices. The dominant plant communities and/or associations within each of the six cover types are summarized in Table 3.7.1-1.

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1 Includes all non-tidal wetlands dominated by woody vegetation less than 5 meters in height and coverage greater than 20 percent (http://www.epa.gov/mrlc/definitions.html).

2 Includes all non-tidal wetlands dominated by woody vegetation greater than or equal to 5 meters in height and coverage greater than 20 percent.

TABLE 3.7.1-1

Bear Den Project
Vegetation Cover Types within the Project Area

Vegetation Cover Type	Dominant Communities/Associations	Acreage [a]	Percent of Project Route
Grassland	Northwestern Great Plains Mixedgrass Prairie, Western Great Plains Sand Prairie, Western Great Plains Badland, and Introduced Upland Vegetation – Perennial Grassland and Forbland.	630.0	69
Agriculture	Cultivated Cropland and Pasture/Hay.	136.0	15
Wetland/Open Water	Western Great Plains Depressional Wetland Systems, Western Great Plains Floodplain Systems, Western Great Plains Wooded Draw and Ravine, Inter-Mountain Basins Greasewood Flat, and Open Water.	121.0	13
Developed	Developed/Open Space and Disturbed/Non-specific.	9.0	1.0
Forest and Woodland	Western Great Plains Dry Bur Oak Forest and Woodland and Southwestern Great Plains Canyon	7.0	0.8
Shrubland	Northwestern Great Plains Shrubland and Inter-Mountain Basins Big Sagebrush Steppe	11.0	1.2

[a] Acreage is the total affected acreage by construction, which includes temporary workspaces and permanent easement/facilities.

Mixed grass prairie is the prominent vegetation cover type along the Project route and aboveground infrastructure followed by cultivated crops and agriculture.

3.8 Noxious Weeds and Invasive Species

An increasing concern in North Dakota from future development is the introduction, spread, and proliferation of noxious weed and invasive plant species. The Federal Noxious Weed Act of 1974 defines a noxious weed as “a plant which is of foreign origin, is new to, or is not widely prevalent in the United States, and can directly or indirectly injure crops or other useful plants, livestock or the fish and wildlife resources of the United States, or the public health” (Public Law [PL] 93-629). North Dakota Noxious Weed Law and Regulations defines a noxious weeds as “weeds that are difficult to control, easily spread, and injurious to public health, crops, livestock, land, or other property” (North Dakota Century Code [NDCC] 7-06-01-02) (USFS, 2007). Currently, there are weed boards in all of North Dakota’s 53 counties, including McKenzie and Dunn Counties. Each county has the option to add additional species to the state’s noxious weed list for enforcement only in their jurisdiction.

The effects of noxious weed growth on native plants include: a decline in ecosystem diversity and health; an increase in bare soil resulting in declines in watershed condition; a decrease in the overall capacity of the land to support wild and domestic ungulates; and a reduction in the quality of habitat for many wildlife species. Another concern is the current infestation in and along riparian corridors. Water in these habitats transports seeds and spores, spreads the infestation, which further reduces riparian habitat structure, and leads to an increase in sedimentation and a reduction in water holding capacity (USFS, 2007). Failure to control or eradicate infestation sites could lead to the spread of weeds, which displace native plant material. Some may be toxic to animals and humans, and few are desirable forage species for livestock or wildlife. The spread of these species increases the adverse impacts to humans, animals both domestic and wild, and native plant communities. Without treatment, weeds increase about 14 percent per year under natural conditions (USFS, 2007).

3.8.1 Affected Environment

CEBCS has conducted and completed field studies (summarized in the Weed Survey Results; West, 2012), file searches, and weed consultations to identify existing weed infestations along the pipeline rights-of-way and adjacent extra workspaces, along new or improved access roads, and within ancillary

facility locations where clearing would be required as part of the proposed Project (Appendix A). To identify weeds that potentially occur within the Project area and known locations of weed infestations crossed by the proposed Project route, CEBCS consulted with the BLM, USFS, and county weed control departments. Early identification of existing infestations is intended to help minimize the spread of weeds by identifying sites where preventative measures could be implemented. Information resulting from identification before, during, and after construction, including species identified within or adjacent to the project area, locations of infestations, and extent of infestations, would be coordinated with the BLM.

Table 3.8.1-1 below lists the federally and state-designated noxious weeds that occur within North Dakota and were identified during weed surveys. Additionally, McKenzie County requires management for its county-specific species.

TABLE 3.8.1-1

Bear Den Project
Federally and State-Designated Noxious Weeds within North Dakota

Common Name	Scientific Name	U.S. Forest Service Designated Species	North Dakota Designated Species	Species Identified During Noxious Weed Surveys [a]
Russian knapweed	*Acroptilon repens*	X	X	
Crested wheatgrass	*Agropyron cristatum*	X		X
Tall wheatgrass	*Agropyron elongatum*	X		
Intermediate wheatgrass	*Agropyron intermedium*	X		
Quackgrass	*Agropyron repens*	X		
Common burdock	*Arctium minus*			X
Absinth wormwood	*Artemisia absinthium*	X	X	X
Smooth brome	*Bromus inermis*	X		X
Japanese brome	*Bromus japonicus*	X		X
Downy brome	*Bromus tectorum*	X		
Hoary cress	*Cardaria draba*	X		
Spiny plumeless thistle	*Carduus acanthoides*	X		
Musk thistle	*Carduus nutans*	X	X	
Diffuse knapweed	*Centaurea diffusa*	X	X	
Spotted knapweed	*Centaurea maculosa*	X	X	
Yellow starthistle	*Centaurea solstitialis*	X		
Canada thistle	*Cirsium arvense*	X	X	X
Field bindweed	*Convolvulus arvensis*	X		X
Houndstongue	*Cynoglossum officinale*	X		
Leafy spurge	*Euphorbia esula*	X	X	X
Baby's breath	*Gypsophila paniculata*			
Halogeton	*Halogeton glomeratus*	X		
Black henbane	*Hyoscyamus niger*	X		
Dalmatian toadflax	*Linaria genistifolia*		X	
Yellow toadflax	*Linaria vulgaris*		X	
Purple loosestrife	*Lythrum salicaria, L. virgatum*	X	X	
Sweet clover	*Melilotus* spp	X		
Kentucky bluegrass, Canada bluegrass	*Poa pratensis, P. compressa*	X		X
Sowthistle	*Sonchus* spp	X		
Saltcedar	*Tamarix chinensis, T. ramosissima*		X	X

[a] Full results of the weed surveys including maps and specific locations are included in the Weed Management Plan (POD Appendix K).

3.9 Special Status Animal Species

3.9.1 Affected Environment

Special status animal species are those listed under the Endangered Species Act (ESA) of 1973, as amended, or are listed as Sensitive by the USFS (February 2011 Regional Forester's Sensitive Species List for Region 1). North Dakota does not have a state endangered or threatened species list; therefore, only those species listed by the ESA are considered threatened or endangered in North Dakota. While the BLM did not provide a list of sensitive species that could occur within or near the Project area, the BLM agreed with using the ESA-listed species and USFS Sensitive Species lists on BLM lands during a pre-survey meeting held in Dickinson, North Dakota on February 13, 2013. Therefore, federally listed ESA species and the USFS Sensitive Species identified for review and analysis for the Project area were reviewed for potential impacts to BLM lands. A total of six ESA and 20 sensitive terrestrial and aquatic species were identified by the FWS, USFS, and BLM as potentially occurring within the Project area. These special status terrestrial and aquatic species, their habitat associations, and their potential occurrence within the Project area are summarized in Table 3.9.1-1.

Two ecoregions are crossed by the Bear Den Project; the Missouri Plateau and the Little Missouri Badlands. The Missouri Plateau Ecoregion is semi-arid mixed grass prairie with a mosaic of spring wheat, alfalfa, and pastureland in North Dakota. The Little Missouri Badlands Ecoregion is a highly dissected erosional landscape of conical hills with shortgrass prairie with juniper in the draws and along north slopes.

A total of six federally listed terrestrial and aquatic species were identified by the FWS as potentially occurring within the Project area and include the interior least tern, the whooping crane, the pallid sturgeon, the gray wolf, the piping plover, and the black-footed ferret. There is designated critical habitat for piping plovers along the Missouri River; however, there is no designated piping plover critical habitat within one half mile of the Project. The Sprague's pipit, the greater sage-grouse, the Poweshiek skipperling, and the Dakota skipper are all federally listed as candidate species and are also considered USFS/BLM Sensitive Species in the Project area. A Biological Assessment (BA) has been prepared for the Project to determine impacts to federally listed species as well as two federal candidate species, the Sprague's pipit and Dakota skipper, that are likely to occur in the Project area; however, two ESA species were eliminated from detailed analysis in the BA, the gray wolf and black-footed ferret, because they are not likely to occur in or adjacent to the Project area.

The February 2011 Regional Forester's Sensitive Species List for Region 1 (USFS, 2011a, 2011b) was used to generate a list of species known to occur within or adjacent to the Project area. A total of 20 special status terrestrial and aquatic wildlife species were identified by the USFS/BLM as potentially occurring within the Project area. A Biological Evaluation (BE) has been prepared for the Project to determine impacts to USFS/BLM Sensitive Species. A total of 10 USFS/BLM Sensitive Species (wildlife species) were eliminated from a detailed analysis in the BE. This determination was based on:

1) correspondence with USFS and BLM staff;

2) habitat requirements and the known distribution of the species relative to the Project area;

3) habitat analysis along the Project route;

4) field surveys; and

5) available literature.

The 10 USFS/BLM sensitive wildlife species eliminated from detailed analysis in the BE are: bald eagle, burrowing owl, greater prairie-chicken, greater sage-grouse, black-tailed prairie dog, Arogos skipper, broad-winged skipper, Dion skipper, Poweshiek skipperling, and Mulberry wing.

TABLE 3.9.1-1

Bear Den Project
Special-Status Animal Species with the Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status [a]	Habitat Within Project Area [b]
Birds			
Bald eagle	*Haliaeetus leucocephalus*	FS, BGEPA	Potential nesting habitat may occur within the Project area; however, of the 103 individual nests sites identified in the state, none were located in the badland ecoregion (Johnson 2010). Suitable foraging habitat for the bald eagle potentially occurs within the Project area. This species typically occurs near large waterbodies, which support suitable roosting, nesting, and foraging habitat. Bald eagles are present in North Dakota year-round. Peak breeding season occurs from early April to July. (Hagen et al., 2005).
Baird's sparrow	*Ammodramus bairdii*	FS	Potential habitat occurs within the Project area. This species typically occurs in extensive tracts of native mixed grass prairie but would utilize idle, tame grasslands, lightly to moderately grazed pastures, and wetland basins, wet meadows, and dense stands of grass in cropland. A documented nest occurred 14-miles from the Project area. Peak nesting season is from late May through mid-August (Deschant et al., 2003).
Burrowing owl	*Athene cunicularia*	FS	Potential habitat exists in black-tailed prairie dog colonies along the Project. In North Dakota, they are primarily found west of the Missouri River where they select shortgrass or grazed mixed-grass prairie with burrows commonly dug by black-tailed prairie dogs and Richardson ground squirrels (Deschant et al., 2003; Hagen et al., 2005). On federal lands, the closest burrowing owl nesting site occurs on USFS land within a 39.4-acre prairie dog colony that is approximately 5 miles southeast of Project. Four active prairie dog colonies exist along the Project on private land. Peak breeding season occurs from early May to mid-August (Hagen et al., 2005).
Greater sage-grouse	*Centrocercus urophasianus*	FC, FS	The closest lek is approximately 80 miles southwest of the Project area in Slope and Golden Valley County (Smith et al., 2004). In North Dakota, sage-grouse have declined by 50 percent over the past 45 years. Greater sage-grouse are restricted to approximately 490 square miles of habitat spread across the extreme southwestern portion of North Dakota.
Greater prairie-chicken	*Tympanuchus cupido*	FS	There are no populations of greater prairie-chicken in McKenzie and Dunn Counties (Hagen et al., 2005). In North Dakota, relatively small and isolated populations of prairie-chicken are primarily found in the southeastern portion of the state east of the Missouri River (USGS, 2006). The greater prairie-chicken is considered an area-sensitive species that requires large expanses of grassland in a relatively open condition (Svedarsky et al., 2003).
Interior least tern	*Sterna antillarum athalassos*	FE	Potential habitat exists where the Project crosses the Little Missouri River. This species inhabits sparsely vegetated sandbars or shoreline salt flats of lakes along the Missouri River System. There is no critical habitat designated for the species. About 100 pairs breed in North Dakota. They are present in North Dakota from mid-May to mid-August. Peak breeding season occurs from early June to mid-Jul (Hagen et al., 2005).

TABLE 3.9.1-1 (cont'd)

Bear Den Project
Special-Status Animal Species with the Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status [a]	Habitat Within Project Area [b]
Loggerhead shr ke	*Lanius ludovicianus*	FS	Potential habitat occurs within the Project area. This species inhabits open country with thickets of small trees, shrubs, and shelterbelts. The loggerhead shrike is present in North Dakota from mid-March to October. Peak breeding season occurs from early May to mid-July (Hagen et al., 2005).
Long-billed curlew	*Numerus americanus*	FS	Potential habitat occurs within the Project area. This species is rare in North Dakota and inhabits expansive short grasslands with topography that is open, flat to gently rolling, or sloping. Proximity to water is an important habitat component. Peak breeding season occurs from early May to early July (Hagen et al., 2005).
Piping plover	*Charadrius melodus*	FT	Potential habitat exists where the Project crosses the Little Missouri River. This species inhabits sandy or gravelly beaches and sandbars or alkaline wetlands and nests on exposed, sparsely vegetated shores and islands of shallow, a kali lakes and impoundments. Critical habitat has been designated along the Missouri River which is over a half mile from the Project area. Peak breeding season occurs from late May to mid-July. (Hagen et al., 2005).
Sprague's pipit	*Anthus spragueii*	FC, FS	Potential habitat occurs within the Project area. This species inhabits extensive tracts (190 ha) of native mixed-grass prairie, ungrazed or lightly grazed prairie, with well-drained open areas, and avoid edge habitat. Highest density of this species occurs in northwestern and north central North Dakota. Sprague's pipit is present from mid-April to mid-October. Peak breeding season occurs from early May to mid-August (Hagen et al., 2005). During the breeding season, Sprague's pipits prefer large patches of native grassland with a minimum size requirement thought to be approximately 145 ha (358.3 ac) (range 69 to 314 ha (170 to 776 ac)) (Davis, 2004). They were not observed in areas smaller than 29 ha (71.6 acres) (Davis, 2004). Nests have been documented within at least 14 miles of the Project area on federal land.
Whooping crane	*Grus Americana*	FE	Potential stopover habitat exists along the Project area. The Project is located where approximately 95 percent of whooping cranes have been observed migrating through the state. They use croplands, freshwater wetlands, and submerged sandbars in wide unobstructed rivers isolated from human disturbance. Visual obstructions (i.e., vegetation, buildings, topography) are avoided by whooping cranes. Spring and fall migration through the Project area generally occurs from April to mid-May and from mid-September to October (Hagen et al., 2005).
Mammals			
Gray wolf	*Canis lupis*	FE	Suitable habitat exists within the Project area, but no breeding records have been documented in the state. They use a variety of habitats that support a large prey base, including montane and low-elevation forests, grasslands, and desert scrub. They have been sporadically reported in all quarters of the state besides the southwest. The presence of wolves in North Dakota would remain sporadic with occasional dispersing animals from Canada and Minnesota.
Black-tailed prairie dog	*Cynomys ludovicianus*	FS	Suitable habitat exists within the Project area. They occur within the southwestern portion of the state, with the Missouri River acting as the northeastern-most boundary (Hagen et al., 2005). The Project crosses four black-tailed prairie dog colonies on private property, ranging from 6 to 28 acres in size. The Project traverses the outer edge of three colonies and through the middle of a fourth colony.

TABLE 3.9.1-1 (cont'd)

Bear Den Project
Special-Status Animal Species with the Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status [a]	Habitat Within Project Area [b]
Rocky Mountain bighorn sheep	*Ovis canadensis*	FS	Suitable habitat exists within the Project area. Bighorn sheep inhabit steep, precipitous, rocky terrain adjacent to foraging areas found in the badland ecoregion of North Dakota. They feed on grasses and forbs. Most bighorn in North Dakota occupy federal lands (Dyke et al., 2011). The lambing period in North Dakota can range from April through June with peak activity in late May (LRMP, 2001). Bighorn sheep habitat is crossed by the Project area on federal and private land.
Black-footed ferret	*Mustela nigripes*	FE	Suitable habitat does not exist in the Project area. The closest nonessential/experimental population is approximately 170 miles southeast of the Project area. This species requires large complexes of prairie dog colonies, greater than 80 acres in size with towns no farther than three miles apart to sustain a viable population of 120 ferrets (Hagen et al., 2005).
Fish			
Pallid sturgeon	*Scaphirhynchus albus*	FE	The pallid sturgeon has the potential to occur where the Project crosses the Little Missouri River, but unlikely, because their present range does not include the Little Missouri River (FWS, 2012). The species prefers the bottom of large, shallow rivers with sand and gravel bars. No critical habitat has been established for the pallid sturgeon. Spawning occurs from June through August (Hagen et al., 2005).
Northern redbelly dace	*Phoxinus eos*	FS	Potential habitat exists where the Project crosses the Little Missouri River. This species can be found year-round in portions of the Missouri River drainage, and the Cannonball, Knife, Heart, and Little Missouri rivers (Hagen et al., 2005). This species prefers slower moving stretches of cold, clear headwater streams particularly in pools and behind dams. They do not thrive where larger fish could prey on them. They usually spawn from late May to July.
Invertebrates			
Arogos skipper	*Atrytone arogos iowa*	FS	Potential habitat may be present in the Project area; however, in North Dakota occurrences are limited to the southeast corner and centrally located Ward County (Royer, 2004a). This species requires mesic, undisturbed tall- to mixed-grass native bluestem prairies. Adult flight period is mid-June into July.
Broad-winged skipper	*Poanes viator*	FS	Potential habitat does not occur within the Project area. In North Dakota documented occurrences are limited to the southeast corner (Royer, 2004b). Habitat is within oxbow marshes with sedges and milkweed. Adult flight stage is in July.
Dakota skipper	*Hesperia dacotae*	FC, FS	Potential habitat occurs within the Project area. This species inhabits wet tall-grass or mixed-grass native prairies, often with mountain death camas. Dakota skippers produce one brood in mid-June to early July.
Dion skipper	*Euphyes dion*	FS	Potential habitat does not occur within the Project area. In North Dakota this species can be found in within lush marshes with cattails, sedges and swamp milkweed. They have been documented in southeastern counties of the state. Adult flight period is from July to early August.
Mu berry wing	*Poanes massasoit*	FS	Potential habitat does not occur within the Project area. This species is a wetland obligate and is restricted to patches of narrow-leafed sedges and woody hummock sedge meadows. Documented occurrences are in the southeast portion of North Dakota (Royer, 2004c). Adult flight period is in July.
Ottoe skipper	*Hesperia ottoe*	FS	Potential habitat occurs within the Project area. This species inhabits native tall-grass to mixed-grass prairie, sand prairies, old fields, and ungrazed or lightly grazed prairie. They produce one brood in mid-June to early July. Documented occurrences were within 5.6 miles of the Project.

TABLE 3.9.1-1 (cont'd)

Bear Den Project
Special-Status Animal Species with the Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status [a]	Habitat Within Project Area [b]
Poweshiek skipperling	*Oarisma poweshiek*	FC, FS	Potential habitat does not occur within the Project area. The species has been documented the far eastern portion of North Dakota (Selby, 2005). This species is an obligate resident of undisturbed tall-grass prairies as well as fens, grassy lake and stream margins and moist meadows. The adult flight stage occurs from late June to early July (Royer, 2004e).
Regal fritillary butterfly	*Speyeria idalia*	FS	Potential habitat occurs within the Project area. This species inhabits native tall-grass prairies, damp meadows, marshes, and wet fields. Bluestem grass is an indicator of proper habitat. Adult flight occurs in mid- June (males) through early September (mostly females). Several documented occurrences exist in the area, the closest was 6-miles west of the Project area on USFS land.
Tawny crescent	*Phyciodes batesii*	FS	Potential habitat occurs within the Project area. It is most common in Dunn and Ward Counties. This species inhabits edge habitat where woodlands meet native prairie, usually with bluestem grasses. They produce one brood, which usually emerges during the first week in June. Several documented occurrences exist in the area, the closest was located 600 meters south of the Project area on USFS land.

[a] FE – Federal Endangered
FT – Federal Threatened
FC – Federal Candidate
FS – USFS/BLM Sensitive Species
BGEPA – Bald and Golden Eagle Protection Act

[b] Sources:

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: Baird's Sparrow and Burrowing Owl. Northern Prairie Wildlife Research Center. Jamestown, North Dakota.

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3.10 Special Status Plant Species

3.10.1 Affected Environment

Only one federally listed plant species the western prairie fringed orchid is known to occur within North Dakota; however, habitat for the species is not present within the Project area. There are 14 USFS designated sensitive plant species and 24 watch list plant species that have the potential to be found within the Little Missouri National Grasslands (LMNG) and surrounding areas where the Project occurs (USFS, 2012). The LMNG encompasses nearly 1.0 million acres in the western region of North Dakota within the Badlands Geographic Area and the Rolling Prairie Geographic Area (USFS, 2001). The status, habitat type, and potential to occur on federal lands crossed by the Project has been summarized in Table 3.10.1-1 below for 14 USFS Sensitive Species (plants) and 24 watch list plant species. The habitat types listed for the 14 USFS Sensitive Species in Table 3.10.1-1 is specific to the LMNG (USFS, 2012).

WEST conducted field surveys on BLM and USFS lands to document the presence or absence of USFS Sensitive and watch list plant species on federal lands within the project study area in support of permitting efforts for the Project. The USFS provided a guidance letter containing a list of special-status plant species (14) and watch list plant species (24) for botanical surveys on federal lands. While the BLM did not provide a list of plant species for the botanical surveys on their lands, the BLM agreed with using the USFS lists on BLM lands during a pre-survey meeting held in Bismarck, North Dakota on August 29, 2012.

The surveys were conducted by qualified botanists between August 25 and September 15, 2012, within the survey period specified in the USFS guidance letter. Surveys were accomplished by performing meandering pedestrian transects, zigzagging back and forth across the survey corridor, looking for sensitive and watch species that could occur in the specific habitat. Based on the results, six individuals of the sensitive species, *Townsendia hookeri*, were found on USFS land within or adjacent to the Project area. Although not flowering during the time of the survey, one potential watch list species, *Oxytropis sericea*, was found on or adjacent to USFS and BLM land within the Project area. Although species confirmation was not possible, CEBCS has assumed the 300 individuals on USFS land and the 29 individuals on BLM land within the survey area were the watch list species, *Oxytropis sericea*. CEBCS' consultants would revisit the identified sites within the Project footprint during its flowing and/or seeding period to confirm the actual species.

A BE has been prepared for the Project to determine impacts to USFS Sensitive Species. Of the 14 USFS Sensitive Species (plants) considered in the BE four were eliminated from detailed analysis. This determination was based on: 1) correspondence with USFS staff, 2) habitat analysis and field surveys along the Project route, and 3) available literature. The four USFS Sensitive Species eliminated from detailed analysis in the BE were smooth goosefoot, nodding buckwheat, alyssum-leaved phlox, and limber pine. A determination of effects for watch list plant species is not required within a BE unless one of the species is encountered (USFS, 2012); one potential watch list plant, *Oxytropis sericea*, was encountered and an impact analysis was included in the BE.

TABLE 3.10.1-1

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Habitat Within Project Area[b]
Smooth goosefoot	*Chenopodium subglabrum*	S1	No potential habitat exists within the Project area on federal land. This species inhabits sandbars, terraces, and dune complexes along rivers and creeks. The plant also occurs in exposed sandy substrates in uplands, blowouts, outcrops, and colluvium. The fruiting period is late June – July.
Dakota buckwheat	*Eriogonum visheri*	S2S3	Potential habitat occurs within the Project area on U.S. Forest Service (USFS) land. Found in relatively exposed clay/silt substrates with low plant cover such as outwash zones around eroding buttes, saddles, steep convex slopes, erosional breaks on prairie slopes. Occasionally among dense saltgrass communities. (USFS, 2012). Flowering period: late July to August.
Blue lips	*Collinsia parviflora*	S2	Potential habitat occurs within the Project area on USFS and Bureau of Land Management (BLM) land. This species inhabits woody understories, including green ash/elm draws, Rocky Mountain juniper, mesic shrub communities, and occasional xeric shrub communities. (USFS, 2012). Flowering period: March through July
Torrey's Cryptantha	*Cryptantha torreyana*	S1	Potential habitat exists within the Project area on USFS and BLM land. This species inhabits dry plains, rock outcrops, escarpments, and pine slopes. Flowering period: May to August.
Nodding buckwheat	*Eriogonum cernuum*	S1	No potential habitat occurs within the Project area on federal land. It can be found on exposed sand substrates with low plant cover in grasslands, hillsides, and sandstone outcrops. (USFS, 2012). Flowering period: July.
Missouri foxtail cactus	*Escobaria missouriensis*	SNR	Potential habitat exists within the Project area on USFS and BLM land. This species inhabits prairie slopes and plains, stony to loamy to clayey short-grass to mixed-grass prairies. Also reported in woodlands of ponderosa pine, or *Quercus* spp. Flowering period: June through July.
Sand lily	*Leucocrinum montanum*	S2	Potential habitat occurs within the Project area on USFS and BLM land. This species generally inhabits shortgrass communities with fine textured substrates and crested wheatgrass communities. Reported from open coniferous woodlands and hillsides, sagebrush scrub, sandy flats and areas with well-drained (sandy to rocky) soils (USFS, 2012). Flowering period: April to June.
Dwarf Mentzelia	*Mentzelia pumila*	S1	Potential habitat occurs within the Project area on USFS and BLM land. Scoria exposures and colluvium with low plant cover. Also reported on slopes and sandy plains; occasionally on hard clays and rocky soils. (USFS, 2012). Flowering period: June to early July.
Alyssum-leaved phlox	*Phlox alyssifolia*	S1S2	No potential habitat occurs within the Project area on federal land. Sandy or gravelly soil that is sparsely vegetated. Also reported on clay banks and limestone ridges of open prairie (USFS, 2012).
Limber pine	*Pinus flexilis*	S1	No potential habitat occurs within the Project area on federal land. This species inhabits semi-arid exposed rocky ridges and foothills in the Limber Pine Research Natural Area (USFS, 2012). Flowering period: May (West Inc., 2012). There have been no occurrences of this plant outside Slope County (LRMP, 2001).
Lanceleaf cottonwood	*Populus x acuminata*	S2	Potential habitat occurs within the Project area on USFS and BLM land. Mesic woody draws, often with springs/seeps, occasionally near springs on open hillsides. Floodplains and stream banks. (USFS, 2012; West Inc., 2012).

TABLE 3.10.1-1 (cont'd)

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Habitat Within Project Area[b]
Alkali sacaton	*Sporobolus airoides*	S2	Potential habitat occurs within the Project area on USFS land. This species inhabits areas of secondary succession on clay outwash where tolerant of saline conditions, also on dry to moist sandy or gravelly soil (USFS, 2012; West Inc., 2012). The flowering period is mid-summer.
Easter daisy	*Townsendia exscapa*	SNR	Potential habitat occurs within the Project area of USFS and BLM land. This species inhabits dry plains and hillsides, often with loamy or increased soil development and increased plant cover relative to *T. hookeri* (USFS, 2012). Flowering period: March to May (West Inc., 2012).
Hooker's Townsendia	*Townsendia hookeri*	S1	Potential habitat occurs within the Project area on USFS and BLM land. Eight individual plants were located on USFS land. This species inhabits areas with low to moderate plant cover on dry plains, hillsides, gravelly benches and weathered scoria, but often clay matrix subsoil (USFS, 2012). Flowering period: March – June (eFloras.org).
Spike bentgrass	*Agrostis exarata*	W	Potential habitat occurs within the Project area; the species has been documented in Dunn County, North Dakota (NatureServe.org). Perennial bunchgrass with short rhizomes distr buted throughout much of western North America found primarily in moist sites including stream sides and occasionally in dry habitats (NRCS, 2006).
Indian mi kvetch	*Astragalus astralis (astragalus aboriginum)Astragalus australis*	W	Potential habitat occurs within the Project area. This herbaceous perennial species inhabits sparsely vegetated, stony soil of grasslands, fellfields, and exposed slopes of plains, valleys and alpine areas within its range. (Montana Field Guide, 2013).
Drummond's mi kvetch	*Astragulus drummondii*	W	Potential habitat occurs within the Project area. This species inhabits prairies to open wooded/brushy hillsides/ravines (Montana Field Guide, 2013).
Bentflower mi kvetch	*Astragulus vexilliflexus*	W	Potential habitat occurs within the Project area. This species inhabits rocky knolls and open wooded hillsides (Montana Field Guide, 2013).
Smooth spike-primrose	*Epilobim pygmaeum (Boisduvalia glabella)*	W	Potential habitat occurs within the Project area. This species inhabits small streams and vernal pools, and mossy shores of shallow ponds. (Montana Field Guide, 2013)
Mountain brome	(*Bromus marginatus*)	W	This species inhabits moist woods to dry meadows and sagebrush (NRCS, No date).
Dry spike sedge	*Carex siccata (Carex foenea)*	W	Potential habitat occurs within the Project area. This species inhabits dry open soil in grasslands, wooded areas and open pine forests (Montana Field Guide, 2013b).
Bulrush sedge	*Carex scirpoidea (Carex scirpiformis)*	W	Potential habitat occurs within the Project area. This species inhabits mountain slopes, dry ridges, and fellfields with gravelly non-calcareous soils (Montana Field Guide, 2013b).
Rock clematis	*Clematis Columbiana var. tenuiloba (Clematis tenuiloba)*	W	Potential habitat occurs within the Project area. This species inhabits open woods and prairies, usually over limestone (Montana Field Guide, 2013).
Spreading fleabane	*Erigeron divergens*	W	Potential habitat occurs within the Project area. This species inhabits dry, open, rocky, sandy, and loose soils of grasslands, sagebrush steppe, open forest, and roadsides (Montana Field Guide, 2013).
Taproot fleabane	*Erigeron radicatus*	W	Potential habitat occurs within the Project area. This species inhabits hills and mountains commonly on limestone (Montana Field Guide, 2013).
Yellow fritillary	*Fritillaria pudica*	W	Potential habitat occurs within the Project area. This species inhabits grasslands, sagebrush, or open forest, (Montana Field Guide, 2013b).

TABLE 3.10.1-1 (cont'd)

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Habitat Within Project Area[b]
Bristly mousetail	*Myosurus apetalus var.montanus*	W	Potential habitat occurs within the Project area. This species inhabits wet meadows, vernal pools and sloughs, bogs, muddy shores of lakes and streams (Montana Field Guide, 2013).
Cutleaf evening primrose	*Oenothera laciniata*	W	Potential habitat occurs within the Project area. This species inhabits sandy prairie, disturbed pastures, roadsides, and stream valleys, especially well drained sandy and limestone soils (Wildflower Center, 2013a).
Louisiana broomrape	*Orobanche ludoviciana ssp. Ludoviciana (Orobanche multiflora)*	W	Potential habitat occurs within the Project area. This species inhabits areas that are excessively drained, loose, sandy, or gravelly soil (Montana Field Guide, 2013).
White locoweed	*Oxytropis sericea*	W	Potential habitat occurs within the Project area. Nearly 300 individuals are located on USFS land and 29 individuals on BLM land within or adjacent to the Project area. This species inhabits rocky prairies, gravel banks, exposed ridges, and open wooded hillsides (Montana Field Guide, 2013).
Prairie fameflower	*Phemeranthus parviflorus (talinum parviflorum*	W	Potential habitat occurs within the Project area. This species inhabits sandy acidic soil, overlying bedrock (Quartzite) (eFloras, 2008).
Pondweed	*Potamogeton diversifolious*	W	Potential habitat occurs within the Project area. This species inhabits ponds, lakes, streams, and rivers (Wildflower Center, 2013b).
Varileaf potentilla	*Potentilla diversifolia*	W	Potential habitat occurs within the Project area. This species inhabits drainages and meadows (Montana Field Guide, 2013).
Balm-of-gilead	*Populus x jackii*	W	Potential habitat occurs within the Project area. This species inhabits damp areas often near water.
Shrubby fivefingers	*Sibbaldiopsis tridentata (potentilla tridentata)*	W	Potential habitat occurs within the Project area. This species inhabits gravel shores, dry shale outcrops or prairie hillsides (Wildflower Center, 2013c).
Heartleaf buttercup	*Ranunculus cardiophyllus*	W	Potential habitat occurs within the Project area. This species inhabits mountain meadows and grasslands, along streams and seeps (Montana Field Guide, 2013).
Persistent sepal yellowcress	*Rorippa calycina*	W	Potential habitat occurs within the Project area. This species inhabits riverbanks, shorelines, and sandy soil (Montana Field Guide, 2013).
Upright Carrionflower	*Smilax ecirrhata*	W	Potential habitat occurs within the Project area. This species inhabits rich deciduous woods and thickets.

[a] North Dakota State Rank:

S1 – Critically Imperiled. At high risk because of extremely limited and/or rapidly declining population numbers, range, and/or habitat, making it highly vulnerable to global extinction or extirpation in the state;

S2 – Imperiled. At risk because of very limited and/or potentially declining population numbers, range, and/or habitat, making it vulnerable to global extinction or extirpation in the state.

S3 – Vulnerable. Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas

SNR – Not ranked.

W – Watch List Species.

[b] eFloras. 2008. Flora of North America. Phemeranthus parviflorus. eFloras is published on the Internet. Missouri Botantical Gardens, St. Louis, Missouri & Harvard University Herbaria, Cambridge, Massachusetts. FNA Vol(5).

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TABLE 3.10.1-1 (cont'd)

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Habitat Within Project Area[b]
	Wildflower Center. 2013. Cutleaf evening-primrose (*Oenothers laciniata*). Lady Bird Johnson Wildflower Center. The University of Texas at Austin.		
	Wildflower Center. 2013. Pondweed (*Potamogeton diversifolius*). Lady Bird Johnson Wildflower Center. The University of Texas at Austin.		
	Wildflower Center. 2013. Shrubby fivefingers (*Sibbaldiopsis tridentate*). Lady Bird Johnson Wildflower Center. The University of Texas Austin.		

3.11 Migratory Birds

Migratory birds are protected under the MBTA (1918, as amended). The MBTA prohibits the take or killing of individual birds, their eggs and chicks, and active nests. Section 703 of the MBTA states that "unless and except as permitted by regulations it shall be unlawful at any time, by any means or in any manner, to take, capture, kill, attempt to take, capture, or kill, or possess any migratory bird, any part, nest, or eggs of any such bird...." The MBTA has no incidental take permit or its equivalent. EO 13186 provides guidance to federal agencies to ensure that the environmental impacts of federal actions are properly evaluated for migratory birds and states that particular importance should be given to species of concern, priority habitat, and key risk factors.

In addition to the MBTA, the Bald and Golden Eagle Protection Act (BGEPA) of 1940 is also applicable to the Project. This law prohibits intentional take of an eagle, egg, or nest, including inactive and alternate nests (FWS, 2007b). BGEPA disturbance is defined as that which results in a biologically significant impact; it may include interference with breeding, feeding, sheltering behavior (roosting), or nest abandonment, which can contribute to or cause the agitation of an eagle to the degree that it causes injury or death (FWS, 2007a).

3.11.1 Affected Environment

The Project is located within the Central Flyway, a bird migration route that crosses portions of Montana, Wyoming, Colorado, New Mexico, Texas, Oklahoma, Kansas, Nebraska, South Dakota, and North Dakota, and the Canadian provinces of Alberta, Saskatchewan, and the Northwest Territories (Flyways.us, 2012).

Consistent with current BLM guidance (BLM, 2008; BLM, 2009), CEBCS conducted a broad level habitat assessment for the areas crossed by the proposed pipeline. Migratory bird impacts can be measured at three separate scales: Partners in Flight Bird Conservation Regions (BCRs), USGS Class III ecoregions, and North Dakota GAP Analysis habitat types. BCRs are distinct ecological regions in North America with similar bird communities, habitats, and resource management issues (North American Bird Conservation Initiative, 2007). One BCR is crossed by the proposed Project (BCR 17, Badlands and Prairies). These BCRs can be further subdivided into smaller ecological units such as ecoregions. The Class III Ecoregions of North Dakota were used to estimate habitat impacts at a finer regionally specific scale than the BCRs. Two ecoregions are crossed by the Bear Den Project: the Missouri Plateau and the Little Missouri Badlands. In addition, habitat impacts were assessed using the habitat types defined by the North Dakota GAP Analysis, which are crossed by the Project. The Missouri Plateau Ecoregion is semi-arid mixed grass prairie with a mosaic of spring wheat, alfalfa, and pastureland in North Dakota. The Little Missouri Badlands Ecoregion is a highly dissected erosional landscape of conical hills with shortgrass prairie with juniper in the draws and along north slopes. The highest density and diversity of bird species can be expected to be associated with native prairie, wetlands, and riparian corridors along waterways. Table 3.11.1-1 lists 29 migratory species and 2 year-round species from the list of Birds of Conservation Concern in BCR 17 (Badlands and Prairies) that could potentially be encountered by the Project (FWS, 2008; FWS, 2011).

TABLE 3.11.1-1

Bear Den Project
Migratory Bird Species of Concern[a] Potentially Encountered by the Project

Common Name	Scientific Name	Nesting Habitat	Likely to Nest in Project Area
American Bittern	*Botaurus lentiginosus*	Fringes and shoreline of wetlands dominated by tall, emergent vegetation. Nests located in dense emergent vegetation over water 5-20 cm in depth and less often on dry ground in fields.	Fairly common Yes, potential suitable nesting habitat.
Baird's Sparrow	*Ammodramus bairdii*	Mixed-grass and fescue prairie with scattered low shrubs and residual vegetation from previous year's growing season. Nests located on ground in depression excavated by adult and also may place nest in natural depression.	Fairly common Yes, potential suitable nesting habitat and a known nest within 14-miles of the Project.
Bald Eagle	*Haliaeetus leucocephalus*	Forested areas adjacent to large waterbodies. Nests located in trees often within mature and old-growth forest with suitable waterbodies nearby for foraging. No known nests in the badlands ecoregion of North Dakota but there is potential foraging habitat.	Fairly common to uncommon. Potential suitable habitat but not l kely to nest.
Black-billed Cuckoo	*Coccyzus erythropthalmus*	Shortgrass vegetation characteristic of dry, open, plains often associated with burrowing mammals. Nests located close to roads that are surrounded by bare ground or short grass with high perches nearby and grazed, level pastures with high density of burrows. Brushy margins or woodland openings and prairie shrubs.	Fairly common to rare Yes, potential suitable nesting habitat.
Burrowing Owl	*Athene cunicularia*	Well-drained, level to gently sloping areas characterized by sparse vegetation and bare ground within short-grass or grazed mixed-grass prairie. They require underground burrows dug by mammals.	Uncommon Yes, potential suitable nesting habitat and known nest within 5-miles of the Project.
Chestnut-collared Longspur	*Calcarius ornatus*	Arid, short- to mixed-grass prairie that has been recently grazed or mowed with vegetation height <20– 30 cm. Nests are placed on the ground in a depression excavated by the female often beside cattle dung and usually under a clump of grass.	Abundant to common Yes, potential suitable nesting habitat.
Dickcissel	*Spiza americana*	Grassland, savanna, and cropland. Nests placed near ground level, but not on the ground, in areas containing dense grasses and forbs or 3-4 meters above the ground on woody plants.	Uncommon Yes, potential suitable nesting habitat.
Ferruginous Hawk	*Buteo regalis*	Flat and rolling terrain in grassland or shrub steppe regions. Nests either placed on the ground or in topographically elevated nest sites such as boulders, creek banks, knolls, low cliffs, trees, or bushes.	Fairly common Yes, potential nesting habitat and known nests within 15-miles of the Project.
Golden Eagle	*Aquila chrysaetos*	Rugged portions of the badlands, buttes overlooking native prairie, large trees (cottonwoods), and often associated with prairie dog towns. Nests located on cliffs, trees, ground, river banks, or human-made structures.	Uncommon. Yes, suitable nesting habitat and known nests within 1-mile of the Project.
Grasshopper Sparrow	*Ammodramus savannarum ammolegus*	Moderately open grassland and prairie with patchy bare ground. Distinctive ground nest is very difficult to locate and usually domed with overhanging grasses.	Common. Yes, potential suitable nesting habitat.
Horned Grebe	*Podiceps auritus*	Inland bodies of water such as rivers and small lakes and coastal areas. Nests located in fairly shallow, moderately sized freshwater ponds and marshes with beds of emergent vegetation.	Uncommon west of the Missouri River. Potential suitable habitat unlikely.
Least Tern (Interior)	*Sternula antillarum*	Segments of the Missouri River system with sparse vegetation along sand and gravel bars within wide river channels, salt flats along lake shorelines, dike fields, and several artificial habitats (i.e. sand and gravel pits)	Rare Yes, potential suitable habitat may occur along the Little Missouri River
Lewis's Woodpecker	*Melanerpes lewis*	Open woodlands with a brushy understory offering ground cover, dead or downed woody material, available perches, and abundant insects. Nest cavities excavated in trunk or large branches of large trees that are burned or dead and decaying.	Common Yes, potential suitable habitat.

TABLE 3.11.1-1 (cont'd)

Bear Den Project
Migratory Bird Species of Concern[a] Potentially Encountered by the Project

Common Name	Scientific Name	Nesting Habitat	Likely to Nest in Project Area
Loggerhead shrike	*Lanius ludovicianus*	Pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands. Nests located in trees with thorns that l kely provide increased protection from predators.	Fairly common to uncommon Yes, potential suitable habitat.
Long-billed Curlew	*Numenius americanus*	Open, sparse grassland. Ground nests are located in shortgrass or mixed-grass prairie with flat to rolling topography on relatively dry, exposed sites.	Rare Yes, potential suitable habitat.
Marbled Godwit	*Limosa fedoa*	Nests built in short, grassy cover in sparsely vegetated landscapes, grasslands, or wetlands in Northern prairies of Canada and U.S.	Fairly common Yes, potential suitable habitat.
McCown's longspur	*Rhynchophanes mccownii*	Restricted to open habitat and sparse vegetation provided by the semi-arid shortgrass steppe. Nests are constructed in shallow depressions on the ground. Only one track of native prairie is known to have breeding individuals in southwest corner of state.	Rare Not likely to nest in the Project area.
Mountain Plover	*Charadrius montanus*	Generally a bird of open, flat, dry tablelands with low, sparse vegetation. Nests on bare ground in shortgrass prairie of the Great Plains region.	Rare Not likely to nest within the Project area.
Peregrine Falcon	*Falco peregrinus anatum*	Nest on cliffs from about 25–1,300 feet high. Other sites include electricity transmission towers, quarries, silos, skyscrapers, churches, and bridges. Only known nest in the state is on a building in Fargo.	Rare Yes, potential nesting habitat and migratory stopover habitat.
Pinyon Jay	*Gymnorhinus cyanocephalus*	Dry environments with cliffs or bluffs and shrub-steppe deserts. Nests are placed on ledges, crevices, bluffs, isolated rock outcrops, human-made structures, in trees in pinyon-juniper woodlands, sagebrush, scrub oak, and chaparral communities, and sometimes in pine forests.	Uncommon No, does not generally nest in the state.
Piping Plover (Interior)	*Charadrius melodus*	Prairie alkali lakes and free flowing portions of the Missouri River and the Yellowstone River with barren river sandbars.	Uncommon Yes, potential suitable habitat may occur along the Little Missouri River.
Prairie Falcon	*Falco mexicanus*	Nests are on overhanging, south-facing cliffs up to 500 feet high. They also nest in trees, on powerlines, on buildings, in caves, or in stone quarries. They inhabit grasslands, shrub-steppe, deserts, and other open areas.	Uncommon Yes, potential nesting habitat and known nests within 1-mile of the Project.
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Found in deciduous woodlands, especially with beech or oak, lowland and upland habitats, river bottoms, and open wood, groves of dead and dying trees. Nests are made in dead trees or in dead portions of live trees.	Common to rare Yes, potential nesting habitat.
Sage Sparrow	*Amphispiza belli*	Prefers semi-open habitats with evenly spaced shrubs 1–2 m high. Nests mainly in shrubs but also in bunchgrass and occasionally on ground under shrubs.	Rare No, does not generally nest in the state
Sage Thrasher	*Oreoscoptes montanus*	Shrub-steppe dominated by big sagebrush. Nests most commonly in big sagebrush and three-tip sagebrush, and occasionally uses other species such as low sagebrush.	Rare No, does not generally nest in the state
Sharp-tailed Grouse	*Tympanuchus phasianellus*	Tracks of relatively undisturbed mixed-grass prairie with scattered patches of small trees and shrubs or near the margins of woodlands. Occasionally uses agricultural cropland. Year-round resident.	Fairly common Yes, potential nesting habitat and known leks within 1-mile of the Project.
Short-eared Owl	*Asio flammeus*	Typically large expanses of prairie and coastal grasslands, heathlands, shrub-steppe, and tundra. Ground nests are typically located in large expanses of prairie and coastal grasslands, heathlands, shrub-steppe, and tundra.	Fairly common to uncommon Yes, potential suitable nesting habitat.

TABLE 3.11.1-1 (cont'd)

Bear Den Project
Migratory Bird Species of Concern[a] Potentially Encountered by the Project

Common Name	Scientific Name	Nesting Habitat	Likely to Nest in Project Area
Sprague's Pipit	*Anthus spragueii*	Native grasslands of intermediate height and sparse to intermediate vegetation density, low forb density, a little bare ground. Disturbed grasslands may be used; most frequently in idle grasslands. Prefer well-drained areas in open grassland for nesting. Area sensitive, requires large grasslands at least 190 ha.	Uncommon. Yes, potential nesting habitat and known nests within 14-miles of the Project.
Upland Sandpiper	*Bartramia longicauda*	Uses dry grasslands with low to moderate forb cover, low woody cover, moderate grass cover, moderate to high litter cover, and little bare ground. Nests found in native grassland, seeded grassland, grazed pastures, un-grazed grasslands, hayfields, and crop fields.	Common Yes, potential suitable nesting habitat.
Yellow Rail	*Coturnicops noveboracensis*	Wet sedge meadows. Nests located in wet sedge meadows dominated by *Carex lasiocarpa* with moist substrate to standing water.	Rare, generally found east of the Missouri River. Potential suitable nesting habitat not likely.
Whooping Crane	*Grus americana*	Roosting and feeding along migration in a variety of habitats including submerged sandbars in wide, unobstructed river channels isolated from human disturbance, freshwater wetlands with shallow areas, and croplands.	Rare Occasional migrants using potential suitable stopover habitat.

[a] List of species is from Birds of Conservation Concern (FWS, 2008); and/or Birds of Management Concern and Focal Species (FWS, 2011).

As described in Table 3.11.1-1, based on USFS data, prairie falcons, ferruginous hawks, golden eagles, Sprague's pipits, Baird's sparrows, sharp-tailed grouse, and burrowing owls are the migratory bird species of concern that are known to nest in or near the Project area (USFS, 2013). Raptor surveys conducted in April and May 2013 located 3 active golden eagle nests within 1.0 mile of the project area.

3.12 Aquatic Wildlife

3.12.1 Affected Environment

A total of 65 waterbodies were identified during the 2012 survey conducted by WEST. The field surveys were conducted from August 28-October 9, 2012 and the area surveyed was 200-feet-wide along the proposed Project centerline (100 feet on either side), 25 feet on either side of the proposed access roads, and the acreage associated with the storage/transfer facilities, contractor yards and aboveground facilities. Several types of wetlands, rivers, streams, creeks, and unnamed drainages are present within the Project area. The major perennial streams/rivers crossed by the proposed pipeline route include the Little Missouri River, Cherry Creek, Bear Creek, Big Gulch, Cottonwood Creek, Deep Creek, Lost Bridge, Elkhorn Creek, Rough Creek, Lower Crosby Creek and Spring Creek.

The central and northern Great Plains region (essentially the Missouri River drainage) is home to approximately 200 species of fish (Iierkley et al., 1998). Minnows (Cyprinidae), perches (Percidae), suckers (Catostomidae), and catfishes (Ictaluridae) comprise about 70 percent of the native fish fauna. Historic information on the aquatic environments and resources is limited for the Little Missouri River drainage located within the Project area. The most recent assessments of the fish fauna of the Little Missouri River were completed in 1993 (Iierkley et al., 1998). Iierkley sampled the fish community at 11 stations during June and September within the Little Missouri River drainage north of Medora. Eleven species were collected: goldeye, longnose dace, channel catfish, fathead minnow, plains minnow, western silvery minnow, sauger, creek chub, flathead chub, white sucker, and brook stickleback (EPA and National Park Service [NPS], 1998).

3.13 Terrestrial Wildlife

3.13.1 Affected Environment

The Project area is located entirely within the Northwestern Great Plains ecoregion encompassing the Missouri Plateau section of the Great Plains of west-central North Dakota. The landscape consists of a semi-arid rolling plain of shale, siltstone, and sandstone, punctuated by agriculture and rolling plains topography with isolated sandstone buttes and badland formations and minimal wetland basins. Upland and wetland wildlife habitats that are present include cultivated cropland, introduced perennial grassland and forbland, native grassland, shrubland, forest and woodland, riparian areas, and herbaceous wetlands. Mixed grassed prairie is the prominent vegetation cover type along the Project area followed by cultivated crops and agriculture. Based on these habitat associations, wildlife species that may occur along the majority of the Project route include large and small mammals, raptors, waterfowl, game and non-game birds, reptiles, and amphibians.

Mammal species present in the Project area are typical of those inhabiting mixed short-grass prairie and agricultural areas in northwestern North Dakota. Wildlife diversity and abundance is highest in the native grasslands and agricultural lands, and along fence rows, ditches, and in wetland and riparian areas. The mosaic of these habitats provides wildlife with areas for foraging, cover, and breeding.

Big game species that occur in this region include pronghorn (*Antiocapra Americana*), mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), elk (*Cervus elaphus*), and Rocky Mountain bighorn sheep (*Ovis canadensis*). The Rocky Mountain bighorn sheep is a USFS/BLM Sensitive Species and is discussed further in Section 3.9 Special Status Animal Species. According to NDGFD, habitat for big game species can be classified as primary and secondary based on relative species abundance. Primary range refers to the areas where a species is most abundant, and secondary range refers to the areas where a species is not abundant, but is still present (NDGFD, 2012). White-tailed and mule deer populations in North Dakota are managed by NDGFD in permanent deer management units. Pronghorn are managed in units different from those for white-tailed and mule deer. Pronghorn tend to inhabit grasslands and shrublands on flat to rolling topography, especially sagebrush throughout the year. During winter, pronghorn typically utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and east-facing slopes (Fitzgerald et al., 1994). Pronghorn occur throughout the majority of the Project area. Mule deer feed on a wide variety of plants including forbs, grasses, sedges, shrubs, and trees, and in the winter occur in areas of relatively high sagebrush densities and overall low snow accumulation, on south- and east-facing slopes (Fitzgerald et al.,1994). Mule deer occur throughout the majority of the Project area, inhabiting virtually all vegetation types. White-tailed deer occur throughout the entire state, are considered widespread and common, inhabiting woodlands, riparian areas and agricultural lands (NDGFD, 2012d). In winter, white-tailed deer congregate in woodland habitat (Fitzgerald et al., 1994). Elk occur in a variety of habitats in the Project area including woodlands, shrublands, grasslands, and agricultural areas.

Small game species that occur in the Project area include upland game birds, furbearers, waterfowl, and small mammals. Furbearers that occur along the Project route include beaver (*Castor canadensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitus mephitus*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), long-tailed weasel (*Mustela frenata*), badger (*Taxidea taxus*), bobcat (*Felis rufus*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*) (NDGFD, 2012d). These species have wide distributions in North Dakota and are found within all habitat types present in the Project area. Numerous species of waterfowl nest in, and migrate through, the Project area, utilizing the wetland/waterbody habitats present there. Common waterfowl species in the Project area include Canada goose (*Branta canadensis*), mallard (*Anas platyrhyncos*), green-winged teal (*Anas crecca*), northern pintail (*Anas acuta*), gadwall (*Anas strepera*), and American wigeon (*Anas americana*) (Stokes and Stokes, 1996). A diversity of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupies a variety of trophic levels and habitat types in the Project area. Common nongame wildlife species include small mammals, such as bats, voles, gophers, prairie dogs, woodrats, and mice. These small mammals provide a substantial prey base for predators in the Project area, including larger mammals (coyote, badger, bobcat), raptors (eagles, buteos, accipiters, owls), and reptiles (snakes).

3.14 Cultural Resources

A cultural resource is a definite location of human activity, occupation, or use identifiable through field survey, historical documentation, or oral evidence (BLM Manual 8100). Cultural resources generally must be at least 50 years old, and encompass a diverse array of property types including buildings, structures (e.g., bridges, canals, railroads), sites, objects, and districts. In addition, certain cultural resources may be defined as cultural landscapes, which are classified either as historic sites, historic designed landscapes, historic vernacular landscapes, or ethnographic landscapes (NPS, 1998). Finally, certain areas that are associated with the cultural practices or beliefs of a living community or cultural group may qualify for consideration as traditional cultural properties (Parker and King, 1998).

Applicable Federal Laws and Regulations

Federal historic preservation laws provide a mandate and procedures for the identification, documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings, which can include private undertakings operating under federal license, or on federally managed lands. The NEPA requires federal agencies involved in undertakings to consider the potential effects to the "human environment"—an all-encompassing term that has been interpreted to include historical and archaeological resources.

The National Historic Preservation Act (NHPA) requires federal agencies to consider an undertaking's effects on "historic properties," which are defined as cultural resources listed or determined eligible for listing on the National Register of Historic Places (NRHP). Section 106 of the NHPA and accompanying implementing regulations specified in 36 CFR 800 ("Protection of Historic Properties") establish a collaborative consultation/review process and specific sequential procedures that enable federal agencies to identify historic properties that may be directly or indirectly affected by a proposed federal undertaking. The Archaeological Resources Protection Act (ARPA) requires federal agencies to protect archaeological resources and sites located on public and Indian lands. The Native American Graves Protection and Repatriation Act (NAGPRA) requires federal agencies to return cultural items including human remains, funerary objects, sacred objects, or objects of cultural patrimony, to culturally affiliated Indian tribes and establishes procedures for the inadvertent discovery of these cultural items on federal or tribal lands. NDCC 23-06-27 protects unmarked human burials and Century Code 55-02-07 protects historic and prehistoric sites located on land owned by the state of North Dakota.

The National Register of Historic Places (NRHP) Eligibility Criteria

The NRHP is the nation's inventory of historic properties. Resources determined officially NRHP-eligible through consultation with the SHPO, as well as those already listed on the NRHP, warrant impact assessment under Section 106 of the NHPA. To qualify as a historic property, a property generally must be at least 50 years old, and must meet the NRHP Criteria for Evaluation (36 CFR 60.4):

> "The quality of significance in American history, architecture, archeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association and meet at least one of the following criteria:
>
> **Criterion A** – are associated with events that have made a significant contribution to the broad patterns of our history; or
>
> **Criterion B** – are associated with the lives of persons significant in our past; or
>
> **Criterion C** – embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

Criterion D – have yielded, or may be likely to yield, information important in prehistory or history."

3.14.1 Affected Environment

The Project area is located within the Missouri Plateau and Little Missouri Badlands physiographic provinces and the Little Missouri River Study Unit (LMRSU) and the Knife River Study Unit (KRSU) as defined by the North Dakota State Historic Preservation Office. The following cultural history is a brief synopsis of the published work by Gregg and Bleier (2008a and 2008b). Paleoindian materials are sparse in the Project area. Although Paleoindian occupations within the western United States as a whole have evidence for extensive movement and large mobility ranges, the lithic materials from this area indicate a preference for locally available source material rather than exotic materials. Paleoindian occupations may have been intense but short lived, perhaps part of a much larger round of group movements. Plains Archaic Period sites (2800-400 B.C.) are common throughout this area, with Middle and Late Archaic sites being more common. Settlement models have been proposed suggesting that Middle Archaic McKean peoples settled the badlands establishing a long-term camp while utilizing a series of smaller, periphery camps. Subsistence strategies during the Middle Archaic appear to have centered on large game including bison, elk, deer, and antelope. By the Late Archaic, the predominance of bison indicates a shift in subsistence strategies. Plains Woodland tradition sites (400 B.C.–A.D. 1200) have been found throughout the project area, with Middle and Late Woodland being more common. Stone circle sites, large base camps, hunting camps, and quarry sites have been identified near the Project area. The presence of substantial quantities of fire-cracked rocks suggest that plant materials were processed during this time. Plains Village Period sites (A.D. 1200–1780) are infrequent in this area. Eagle trapping sites, which often include conical lodges, are found in this period. Much of the area was traditionally Hidatsa territory while other groups passed through as they traveled to their hunting territories.

The Lewis and Clark expedition passed through the region in 1804. A series of short-lived fur trade posts established the Dakota fur trade in the early 1800s, which wanted by the mid-1850s. The extension of the Northern Pacific Railroad into North Dakota spurred Euroamerican settlement of far west-central North Dakota, with large numbers of homesteads established between 1900 and 1910. Early settlers along the Little Missouri River attempted intensive agriculture though the majority of these homesteaders engaged in cattle or sheep ranching. The drought of the 1920s and 1930s led to a land utilization movement to purchase privately owned lands in order to reform land use by revegetating cropland and converting it to pasture. The Land Utilization Program, developed in 1934 as part of the New Deal, allowed for the purchase of much land in this area, which is now part of the LMNG. Large deposits of lignite coal were discovered in McKenzie County, which led to a flourishing of the mining industry beginning in the 1930s and continues to this day.

Area of Potential Effects

The area of potential effects (APE) is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking."

The APE should include the following:

- all alternative locations for all elements of the Project;
- all locations potentially subject to ground disturbance resulting from construction activities;
- all locations from which elements of the Project (e.g., aboveground facilities; a pipeline trench scar on the landscape) might be visible; and

- all locations in which the Project might cause permanent changes to traffic patterns, land use, and public access.

The direct APE encompasses the 50 – 125-foot-wide construction ROW, additional temporary workspaces (ATWS), aboveground facilities (storage/ transfer facility, block valves, and other ancillary facilities), construction equipment and pipe storage yards, and access roads created or upgraded for pipeline construction and maintenance.

Cultural Resources Investigations

In the fall of 2012, a Class I Inventory (file search) and Class III Inventory (pedestrian survey) was conducted of the APE to identify and evaluate the NRHP-eligibility of all cultural resources that could be impacted by Project construction (Chandler and Mueller, 2012). The Class I file search involved a review of site records and survey reports on file at SHPO within a 1-mile-wide corridor centered on the proposed pipeline centerline. The file search identified a total of 107 previously recorded cultural resources, including 27 prehistoric sites (including 23 lithic scatters; two large, contiguous multicomponent site complexes; one lithic scatter and trail; and one stone circle), 24 historic sites (18 of which are farm/farmsteads and other site types suggesting architecture), 41 prehistoric isolated finds (IFs), 6 historic IFs, and 9 IFs of unknown cultural or temporal affiliation.

The Class III cultural resources inventory involved an intensive-level pedestrian survey of the proposed pipeline route, identified access roads, proposed wellhead facility locations, and an approximately 40-acre storage and transfer facility. The survey corridor was 200 feet wide centered on the proposed pipeline centerline, 100 feet wide centered on the proposed access roads, and a 600-foot-radius circle was surveyed at each proposed wellhead facility location (where the well pad to be serviced was yet to be developed). Approximately 2,365 acres was surveyed for the Project. The Class III Inventory identified 17 cultural resources within the APE, consisting of eight sites and nine IFs/site leads. One historic homestead (32MZ718) and one prehistoric site (32MZ487/32DU1285) are historic properties determined eligible for listing in the NRHP. One IF is a rock cairn (32MZx1282) of undetermined age.

Site 32MZ487/32DU1285 is a large prehistoric site that is on the Little Missouri National Grassland and private land. The site is within pasture lands along a large ridge in the Little Missouri Badlands of eastern McKenzie and western Dunn counties. The site has been heavily disturbed by cultivation and the installation of two pipelines which parallel each other across the site. The site was originally recorded in 1980 and was described as a large site complex on a ridge. The ridge was covered by a low-density scatter of chipped stone, bone, fire-cracked rock (FCR), and ceramics, with concentrations on many knolls. Temporally diagnostic stone tools and ceramics indicated intermittent occupation throughout the Plains Archaic, Late Prehistoric, Plains Woodland, and Plains Village periods. Subsequent testing determined there was a shallow soil development of windblown silt and fine sand overlying bedrock. Sixty-nine artifacts were recovered from the testing units, the majority of which were lithic debitage. The site was revisited in 2012 for the current project. As a result of the visit, five artifacts were noted in disturbances within the grass pastures. Two pieces of chert debitage were found on top of an abandoned rodent burrow and three chert artifacts located in a two-track road. Limited testing was conducted in the area where the debitage was identified during the current project inventory; no cultural material was identified during this limited testing.

Site 32MZ718 is a historic homestead located on the Little Missouri National Grassland and private land, situated on the western side of Cherry Creek about a mile north of its confluence with the Little Missouri River. This site was originally recorded in 1984 as a historic homestead comprised of a standing cabin, a partly standing cabin, remnants of a log building, a flowing well, and a scatter of historic artifacts. The artifacts identified included a wide array of domestic debris including purple glass, crockery, screen, stove parts, lumber, cans, brick, and nails. The site represents the remains of a single occupation historic homestead which was likely occupied between 1908 and 1933. Given the early date for the homestead, the property would have been one of the first properties settle after the 1905 creation of McKenzie County.

Table 3.14.1-1 lists the cultural resource sites identified during the Class III Inventory, as well as their site type and NRHP eligibility. The BLM submitted the Class III Inventory report to the North Dakota SHPO on March 7, 2013 and requested concurrence with these findings. In a letter dated April 5, 2013, the SHPO concurred with the BLM's determination and recommendations.

TABLE 3.14.1-1

Bear Den Project
Cultural Resource Sites Identified

Site No.	Site Type	Site Description	National Register of Historic Places Eligibility
32MZ416	Historic railroad	Great Northern Railroad segment	Not Eligible
32MZ487/32DU1285	Archaic and late prehistoric artifact scatter	Artifact scatter	Eligible
32MZ718	Historic farmstead	Farmstead	Eligible
32MZ1102	Historic farmstead	Farmstead	Not Eligible
32MZ2023	Historic artifact scatter	Artifact scatter/possible dump	Not Eligible
32MZ2084	Historic corral	Corral	Not Eligible
32MZ2085	Historic homestead	Unknown depression/possible homestead	Not Eligible
32MZ2468	Historic homestead	Homestead	Not Eligible

3.14.2 Tribal Treaty Rights and Interests

The federal government has a unique and distinctive relationship with federally recognized American Indian Tribes as set forth in the Constitution of the United States, and various treaties, statutes, Executive Orders, judicial decisions, and agreements. This relationship is different from the federal government's relationship with state and local governments or other entities as the United States recognizes American Indian tribes as distinct sovereign nations. The United States government has a trust responsibility to federally recognized American Indian tribes that covers lands, resources, money, or other assets held by the federal government in trust and the ability of those tribes to exercise their tribal rights.

Indian treaties are negotiated contracts made pursuant to the Constitution of the United States and are considered the "supreme law of the land." They take precedence over any conflicting state laws because of the supremacy clause of the Constitution (Article 6, Clause 2). Treaty rights are not gifts or grants from the United States, but are bargained for concessions. These rights are grants-of-rights from the tribes rather than to the tribes. The reciprocal obligations assumed by the federal government and Indian tribes constitute the chief source of present-day federal Indian law.

The BLM, and represented federal agencies, have the responsibility to identify and consider potential impacts of the proposed action and project alternatives on Indian trust resources. The BLM, as lead federal agency, also has the responsibility to ensure that meaningful consultation and coordination concerning the impacts of the project on tribal treaty rights and trust resources are conducted on a government-to-government basis with federally recognized tribes.

During the 1850s and 1860s, the United States negotiated treaties with some tribes in order to acquire Indian lands for homesteading. Tribes who are consulting parties on the project with traditional or cultural affiliation with the project area have the right to conduct traditional and cultural activities on federal lands crossed by the Project. Several tribes also have treaty rights which enable them to hunt, fish, and gather on unoccupied federal lands within the Project area. Treaties which apply to the Project area include the Treaty with the Sioune and Oglala Tribes, 1825; the Treaty with the Mandan Tribe, 1825; the Fort Laramie Treaty of 1851; the Treaty with the Sioux—Sisseton and Wahpeton Bands, 1851; the Treaty with the Yankton Sioux, 1858; the Treaty with the Sioux—Lower Brulé Band, 1865; the Treaty with the Northern Cheyenne and Northern Arapaho, 1868; and the McCumber Agreement of 1892/Turtle Mountain

The *Handbook of North American Indians*, published by the Smithsonian Institution, is intended to be the most up-to-date and comprehensive encyclopedic summary of what is known about the prehistory, history, and cultures of the aboriginal peoples of North America. Volume 13 (Parts 1 and 2) is devoted exclusively to the cultures of the Plains Indians (DeMallie, 2001). According to DeMallie (2001), the proposed project area is located within the somewhat overlapping aboriginal territories of the Mandan, Hidatsa, Arikara, and Assiniboine (Nakota) peoples. The area was also known to have been traditionally utilized by the Lakota and Dakota Sioux groups primarily for hunting and gathering activities. The Project is located on lands established as the Fort Berthold Indian Reservation for the Arikara, Mandan, and Hidatsa Tribes of Indians by the Fort Laramie Treaty of 1851. These lands were later ceded by the Three Affiliated Tribes of the Mandan, Hidatsa, and Arikara Nation to the U.S. Government by Executive Order in 1880. In 1887, the General Allotment Act (also known as the Dawes Act) was signed which issued land allotments to individual tribal members instead of setting up reservations. Members of the Turtle Mountain Band of Chippewa were granted allotments at this time and they currently hold public allotments within the Project area. The Cheyenne River Sioux Tribe has recently passed a resolution banning the construction of pipelines within their aboriginal territory, which also overlaps the Project area.

Tribal consultation by federal agencies is required by Executive Order 13175, which states, “Each agency shall have a process to ensure meaningful and timely input by tribal officials in the development of regulatory policies that have tribal implications.” The BLM has engaged and would continue to engage with the appropriate tribal governments in official government-to-government consultation, in accordance with all applicable mandates, including Section 101[d][6] of the NHPA; the American Indian Religious Freedom Act (AIRFA); ARPA; Executive Order 13007 (Indian Sacred Sites); Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments); Executive Order 12898 (Environmental Justice); Presidential Memorandum on Government to Government Consultation with Native American Tribal Governments issued on April 29, 1994; and the Presidential Memorandum on Tribal Consultation issued on November 5, 2009. The purpose of these consultations is to ensure meaningful and timely input by tribal officials and representatives in the environmental and cultural analyses for the proposed Project, as well as determine if the Project will have an effect on any known traditional cultural properties, sacred sites, or other sites of religious or cultural importance. On October 29, 2012, the BLM sent letters initiating government to government consultation with 17 tribes who have tribal treaty interests in, and/or traditional connections to, western North Dakota. These tribes are the Lower Sioux Tribe, Lower Brule Sioux Tribe, Northern Cheyenne Tribe, Fort Peck Assiniboine and Sioux Tribes, Sisseton-Wahpeton Oyate Tribe, Three Affiliated Tribes: Mandan, Hidatsa, and Arikara, Flandreau Santee Sioux Tribe, Yankton Sioux Tribe, Spirit Lake Sioux Tribe, Fort Belknap Tribes, Oglala Sioux Tribe, Santee Sioux Tribe, Cheyenne River Sioux Tribe, Rosebud Sioux Tribe, Crow Creek Sioux Tribe, Standing Rock Sioux Tribe, and the Turtle Mountain Band of Chippewa.

Tribal consultation for the Bear Den Project has to date included over 150 telephone conversations and 75 emails with THPOs and other tribal representatives, several formal letters, and three face-to-face meetings (with teleconferencing capabilities provided for those unable to attend in-person). On October 18, 2012 the project was introduced and briefly discussed at an intertribal meeting held in Spearfish, South Dakota. On February 13, 2013, a tribal coordination meeting was held in Dickinson, North Dakota to formally present the project and provide the opportunity for the tribes to ask questions and provide comments. Tribal representatives at this meeting included THPOs and representatives of the Sisseton-Wahpeton Oyate Tribe, Standing Rock Sioux Tribe, Rosebud Sioux Tribe of Indians, and Three Affiliated Tribes: Mandan, Hidatsa, Arikara, Yankton Sioux Tribe, and Oglala Sioux Tribe. The Standing Rock Sioux Tribe participated in person and the other tribes participated by telephone. Line officers and representatives of the BLM, USFS, and SHPO, as well as project managers from CEBCS, NRG, and Alpine Archaeological Consultants were also present.

An additional tribal consultation meeting was held on March 26 and 27, 2013 in Spearfish, South Dakota to discuss the Project. Participants included THPOs and designated representatives from the Cheyenne River Sioux Tribe, Crow Creek Sioux Tribe, Fort Peck Assiniboine and Sioux Tribe, Northern Cheyenne Tribe, Oglala Sioux Tribe, Rosebud Sioux Tribe, Sisseton-Wahpeton Oyate Tribe, Standing Rock Sioux Tribe, Three Affiliated Tribes: Mandan, Hidatsa, Arikara, Turtle Mountain Band of Chippewa, and Yankton Sioux Tribe. Council members from the Yankton Sioux and Cheyenne River Sioux Tribes also were

present at the meeting. Line officers and representatives of the BLM, USFS, and SHPO, as well as project managers from CEBCS, NRG, and Alpine Archaeological Consultants were also present.

The results of the Class III Inventory were presented to the consulting tribes by letter, email, and at the two meetings. The purpose of these consultations are to ensure that the consulting tribes have a reasonable opportunity to identify their concerns about historic properties, advise on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, articulate their views on the Undertaking's effect on historic properties, and participate in the resolution of adverse effects (see 36 CFR Part 800.2 (c)(2)(ii)(A). Many of the consulting tribes expressed concern about the identification of historic properties of traditional religious and cultural importance and asked that a tribal cultural survey of the project area be done.

At the March 26 and 27, 2013 consultation meeting, the participating 11 tribes caucused and drafted a scope of work for tribal survey of sites of traditional cultural and religious significance. The draft scope of work was provided to BLM on April 9 as representing a group proposal submitted by all of the participating tribes. The BLM, Forest Service, and CEBCS reviewed the draft scope of work for a group tribal inventory and had many concerns, particularly regarding the lack of a clear timeline and cost estimate, and the lack of a consistent field methodology and list of deliverables for providing the necessary documentation to complete Section 106 of the NHPA requirements. On April 30, BLM sent a letter to the tribes outlining these concerns and provided the opportunity to discuss these concerns in a conference call on May 10. The Northern Cheyenne, Sisseton-Wahpeton Oyate Sioux Tribes, Standing Rock Sioux Tribe, Cheyenne River Sioux Tribe, and Yankton Sioux Tribe participated in the May 10 conference call. At the request of the participating tribes, CEBCS developed an alternative proposal that took into consideration the tribes' initial group proposal while at the same time meeting project schedule and BLM's obligations in methodology and documentation for completing the Section 106 process. CEBCS's proposal was submitted to the tribes on May 16. Several follow-up phone calls were made the week of May 20 to discuss the alternative proposal with the tribes. On May 23, six of the participating tribes (Cheyenne River Sioux Tribe, Northern Cheyenne Tribe, Rosebud Sioux Tribe, Standing Rock Sioux Tribe, Sisseton-Wahpeton Oyate Tribe, and Yankton Sioux Tribe) called the BLM in a conference call to discuss the reasons why these tribes would not accept the CEBCS's alternative proposal. A few of the six tribes that called on May 23 provided counter offers to CEBCS's proposal on May 24; however, none of the suggested alternatives appeared to meet the timing and fiduciary constraints of CEBCS or the documentation requirements of the BLM. BLM made the decision on May 28 to move forward with the tribes that wanted to participate in CEBCS's proposal for tribal survey. The Fort Peck Assiniboine and Sioux Tribes, Yankton Sioux Tribe, Northern Cheyenne Tribe, and Crow Creek Sioux Tribes accepted CEBCS's alternative proposal and sent tribal representatives to participate in a survey of the project area. Fieldwork is scheduled for the week of June 3. Results of the survey are pending and will be included in the final decision for this project.

Shortly after the March meeting and before the group tribal inventory scope of work was submitted to BLM on April 9, 2013 the Turtle Mountain Band of Chippewa and the Three Affiliated Tribes: Mandan, Hidatsa, and Arikara withdrew their support of a group tribal inventory effort and submitted a separate scope of work to BLM and CEBCS that addressed the cultural resource identification needs of those tribes. In May 2013, representatives from the Turtle Mountain Band of Chippewa and the Three Affiliated Tribes: Mandan, Hidatsa, Arikara, conducted a reconnaissance survey of approximately 10% of the project area focusing on landforms in undisturbed areas. The purpose of the survey was to provide information to the BLM in order for the Authorized Officer to make an informed decision about historic properties of traditional religious and cultural importance. Representatives from these tribes also visited two previously recorded cultural resources (32MZ487/32DU1285 and 32MZx1282) and provided recommendations concerning eligibility and effect. These tribes indicated that site 32MZ487/32DU1285 had been significantly altered by modern disturbances (roads, existing pipelines, and cultivation) to such an extent that site integrity for meaningful tribal relevance is nearly destroyed. The visit to site lead 32MZx1282 revealed that the large cairn was the result of field clearing and the age of the other cairn was indeterminate. No evidence of indigenous sites of traditional religious and cultural importance were observed or recorded during the survey.

3.15 Paleontological Resources

3.15.1 Affected Environment

Regulatory Structure

The Paleontological Resources Preservation Act (PRPA, 16 USC 470aaa *et seq.*) became law in 2009 with the passage of PL 111-011, Title VI, Subtitle D (BLM, 2011). The PRPA includes specific provisions addressing management of these resources by the BLM, NPS, Bureau of Reclamation (BOR), FWS, and USFS. It affirmed the authority for many policies that those agencies already had in place for the management of paleontological resources such as issuing permits for collecting paleontological resources, curation of paleontological resources, and confidentiality of locality data. The PRPA only applies to federal lands and does not affect private lands. It provides authority for the protection of paleontological resources on federal lands including criminal and civil penalties for fossil theft and vandalism. Consistent with policy up to the passage of the act, the PRPA also includes provisions for casual or hobby collecting of common invertebrate and plant fossils without a permit on federal lands managed by the BLM, the BOR, and the USFS, under certain conditions. Casual collecting is not allowed within national parks or other lands managed by the NPS. The Act directed federal agencies to begin developing regulations, establishing public awareness and education programs, and inventorying and monitoring federal lands.

The BLM also managed paleontological resources (fossils) on federal lands under the following statutes and regulations (BLM, 2011):

- Federal Land Policy and Management Act of 1976 (PL 94-579);
- NEPA (PL 91-190); and
- various sections of BLM's regulations found in Title 43 CFR that addresses the collection of invertebrate fossils and, by administrative extension, fossil plants.

In addition to the statutes and regulations listed above, fossils on public lands are managed through the use of internal BLM guidance and manuals. The BLM's Instructional Memorandum (IM) 2008-009 (2007), Manual H-8720-1 (1998), IM 2009-011 (2008), and IM 2012-140 (2012) provide general procedural guidelines for the management of paleontological resources. Management objectives include locating, evaluating, managing, and protecting paleontological resources, as well as ensuring that proposed land-use projects do not inadvertently damage or destroy important paleontological resources.

North Dakota has two laws (passed in 1989) that deal with the management of paleontological resources (NDGS, 2007). The North Dakota Paleontological Resource Protection Act (Section 54-17.3, NDCC), gives the North Dakota Industrial Commission, acting through the office of the State Geologist, the responsibility to protect paleontological resources located on state land. The second law gives the NDGS authority to operate and maintain a public repository for North Dakota fossils.

Potential Fossil Yield Classification System

The BLM has adopted the Potential Fossil Yield Classification (PFYC) system to identify and classify fossil resources on federal lands (BLM, 2011). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants and invertebrates) and the sensitivity to adverse impacts. A higher class number indicates higher potential. The PFYC is not intended to be applied to specific

paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions. The BLM intends for the PFYC system to be used as a guideline as opposed to rigorous definitions. Descriptions of the potential fossil yield classes are summarized in Table 3.15.1-1.

TABLE 3.15.1-1

Bear Den Project
Summary of the Potential Fossil Yield Classification

Class	Description	Basis
1	Igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservation environments that are not likely to contain recognizable fossil remains.	• Fossils of any kind known not to occur except in the rarest of circumstances. • Igneous or metamorphic origin. • Landslides and glacial deposits.
2	Sedimentary geologic units which are not likely to contain vertebrate fossils or scientifically important invertebrate fossils.	• Vertebrate fossils known to occur very rarely or not at all. • Age younger than 10,000 years before present. • Recent aeolian origin deposits. • Diagenetic alteration.
3	Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.	• Units with sporadic known occurrences of vertebrate fossils. • Vertebrate fossils and significant invertebrate fossils known to occur inconsistently; predictability known to be low. • Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance. • Surface-disturbing activities may require field assessment to determine appropriate course of action.
4	Class 4 geologic units contain a high occurrence of significant fossils. Vertebrate fossils or scientifically significant invertebrate or plant fossils are known to occur and have been documented, but may vary in occurrence and predictability.	• Vertebrate fossils and significant invertebrate and plant fossils known to occur with regularity, although their distribution maybe uneven. • The probability for impacting significant paleontological resources is moderate to high. • A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities.
5	Highly fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant invertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.	• Vertebrate fossils and/or scientifically significant invertebrate fossils are known and documented to occur consistently, predictably, and/or abundantly. • Unit is exposed; little or no soil/vegetative cover. • Outcrop erodes readily; may form badlands. • Easy access to extensive outcrop in remote areas. • Other characteristics that increase the sensitivity of both known and unidentified fossil localities. • A field survey by a qualified paleontologist is usually necessary prior to surface disturbing activities.

Source: BLM, 2007

3.16 Visual Resources and Scenic Byways

3.16.1 Affected Environment

The Project would be located entirely within the Northwestern Great Plains Ecoregion. The landscape in the Project area consists of a semi-arid rolling plain of shale, siltstone, and sandstone; punctuated by agricultural land and rolling plains topography with isolated sandstone buttes and badland formations. The dominant existing vegetation communities in the Project area consist of grassland, cultivated agricultural land, shrubland, and developed land, and the primary existing land uses in the area consist of oil and gas development, utility corridors, grazing, and wildlife habitat.

The Project would be located on BLM-managed lands, USFS-administered lands, North Dakota State lands, and private lands. According to the BLM's Visual Resource Management (VRM) Manual 8400, visual resources are the visible physical features of a landscape such as land, water, vegetation, animals, structures, and other features. The BLM's 1988 North Dakota Resource Management Plan does not apply the VRM System to BLM-managed lands crossed by the Project; therefore, no visual value has been assigned to the area. The document directing management of USFS-administered lands within the Project area is the 2001 LRMP for the Dakota Prairie Grasslands. Currently, the LRMP does not contain visual quality objectives in the area of the Project. Private lands and North Dakota State lands that would be crossed by the Project are not subject to visual management standards.

3.17 Hazardous or Solid Wastes

3.17.1 Affected Environment

According to the North Dakota Multi-Hazard Plan, published in 2011, there have been 486 hazardous material releases in North Dakota between 2003 and 2010 that required national notification and response (ND Multi-Hazard Mitigation Plan). The previous Multi-Hazard Mitigation Plan, published in 2008, covered the 10-year period between 1997 and 2006, and reported 615 hazardous material releases in North Dakota, 55 of which were related to pipelines. In 2008, both Dunn and McKenzie County were rated as having a "low" hazardous material release hazard based on the potential damage that could be done to critical infrastructure and key resources. In the latest Multi-Hazard Plan, Dunn County is rated as having a "low" hazardous material release hazard while McKenzie County was rated as "Moderate-High." Both counties have seen a major increase in oil and gas development in recent years, and McKenzie County in particular has seen significant growth in infrastructure.

The Project route would not cross any areas defined as a "uranium deposit" based on exploration boring logs. Uranium is a naturally occurring radioactive material.

The NDDH has compiled a list of oilfield waste management facilities that handle hazardous waste related to oil and gas development, none of which are located in Dunn County or McKenzie County. No hazardous materials are known to have been used, stored, or disposed of at sites within the Project area.

Hazardous Materials

The terms "hazardous material" and "hazardous substance" are defined by multiple regulatory programs as follows:

- U.S. Department of Transportation (USDOT) regulations (49 CFR 105);
- Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 103);
- Resource Conservation and Recovery Act (RCRA) (40 CFR 261); and
- Superfund Amendments and Reauthorization Act (SARA) (42 USC 116).

The term "oil" is defined by the Oil Pollution Act of 1990 (33 USC 2701). Crude oil is considered a hazardous material and is regulated by the USDOT when it is in transit through a pipeline. The EPA has determined that an oil spill be deemed harmful to the public or the environment, when it violates water quality standards, causes a film or discoloration of surface water, or causes a sludge to be deposited on land or beneath the water surface. Any oil discharge that meets any of those qualifications must be federally reported. If a hazardous substance is released in an amount greater than or equal to its reportable quantity, it also must be federally reported. The EPA's National Response Center (NRC) receives all reports of oil and hazardous substance releases when a release requires federal notification. Between 1997 and 2006, the NRC responded to 1 hazardous material release related to pipelines in Dunn County, and 11 in McKenzie County.

Solid Waste

In the context of pipeline projects, "solid waste" is defined by the EPA as materials discarded from industrial, commercial, or mining operations or activities such as garbage, refuse, and other materials. RCRA subsection D includes regulations regarding non-hazardous solid waste.

3.18 Social and Economic Conditions

This section discusses past and present social and economic conditions of the two counties (Dunn and McKenzie) in North Dakota that could be affected by the project. More specifically, this section would summarize the effects of the project on population, economic conditions, income, employment, housing, local government facilities and services, and local government fiscal conditions of these two counties.

3.18.1 Affected Environment

Population

The project location is largely rural, with the combined population of both counties being around 10,000 residents (U.S. Census Bureau, 2010). Both counties are lightly populated, with Dunn and McKenzie counties having a distribution of 1.8 and 2.3 persons per square mile respectively. Table 3.18.1-1, below, shows the population change from the year 2000 to 2010 for the state of North Dakota as a whole, and Dunn and McKenzie county individually (U.S. Census Bureau, 2010).

TABLE 3.18.1-1

Bear Den Project
Population Changes in the Project Area

Location	Population 2000	Population 2010	Population 2012 (estimate)	April 2010 to July 2012 Percent Change	2010 Single Person Households (percent)	2010 Multiple Person Households (percent)
North Dakota	642,195	672,591	699,628	4	32	61
Dunn County	3,600	3,536	3,967	12.2	27	70
McKenzie County	5,737	6,360	7,987	25.6	25	70

Table 3.18.1-1 shows that the population of McKenzie County is increasing at a rate of more than double the rate for the state of North Dakota over the same period of time. A recent study completed by the North Dakota Industrial Commission explored the power demand of North Dakota's counties that produce energy and estimated that the population of those counties would increase by 52 percent over the next 20 years as a result of the increase in oil production (North Dakota Department of Commerce, 2012). Watford City is the largest town within the two counties and has an estimated population of less than 2000 according to the US Census's estimate for 2011.

Economic Conditions

The energy industry is the third largest industry in the state (North Dakota Department of Commerce, 2012), and the state produced nearly 153 million barrels of crude oil in 2011 alone (U.S. Energy Information Administration, 2012). Oil production in North Dakota has more than quadrupled between the years of 2001 and 2011 (North Dakota Department of Mineral Resources, 2012) and this increase has boosted other industries as a result. The North Dakota Industrial Commission's recent study also showed that McKenzie County's electricity needs could grow by 339 percent over the next 20 years which has prompted the need for more power plants in the region (North Dakota Department of Commerce, 2012).

Income

Table 3.18.1-2 shows income statistics for Dunn and McKenzie County as compared to North Dakota as a whole between the years 1999 and 2009. Income increases were sizable for both median household income and per capita income over that time period and the percent change was bigger in both counties than for North Dakota as a whole.

TABLE 3.18.1-2

Bear Den Project
Project Area Income Statistics

Location	Median Household Income 1999	Median Household Income 2009	Per Capita Income 1999	Per Capita Income 2009	Percent Change Median Household Income 1999-2009	Percent Change Per Capita Income 1999-2009
North Dakota	$34,604	$47,898	$17,769	$24,978	38	41
Dunn County	$30,015	$44,681	$14,624	$25,006	49	71
McKenzie County	$29,342	$49,465	$14,732	$26,100	67	77

Source U.S. Census Bureau 2010.

Table 3.18.1-3 shows the change in income for various occupation categories in North Dakota Regions 1 and 8 between 2005 and 2010.

TABLE 3.18.1-3

Bear Den Project
2010 Occupational Annual Wages

Occupation	Average Weekly Wage 2005	Average Weekly Wage 2010	Average Employment 2005	Average Employment 2010	Percent Change Average Weekly Wage 2005-2010	Percent Change Average Employment 2010
Region 1 (McKenzie County)						
Mining, Quarrying, and Oil and Gas Extraction	$1,110	$1,556	1,527	5,381	40	252
Construction	$754	$1,105	549	1,313	47	139
Transportation and Warehousing	$843	$1,469	438	1,276	74	191
Agriculture, Forestry, Fishing, and Hunting	-- [a]	-- [a]	-- [a]	-- [a]	Not applicable	Not Applicable
Healthcare and Social Assistance	$519	$685	1,931	1,884	32	2
Public Administration	$547	$728	1,168	1,408	33	21
Region 8 (Dunn County)						
Mining, Quarrying, and Oil and Gas Extraction	$1,027	$1,678	600	1,764	63	194
Construction	$615	$1,233	865	1,476	100	71
Transportation and Warehousing	$725	$1,168	541	1,137	61	110
Agriculture, Forestry, Fishing, and Hunting	$412	$553	101	162	34	60
Healthcare and Social Assistance	$480	$599	2,711	2,762	25	2
Public Administration	$524	$651	1,090	1,145	24	5

[a] Denotes non-disclosable data.
Source: North Dakota Workforce Intelligence Network 2012.

Employment

Table 3.18.1-3 (above) shows that in both Regions 1 and 8 employment in Mining, Quarrying, and Oil and Gas Extraction has increased substantially. According to the North Dakota Workforce Intelligence Network, employment in this industry is projected to continue increasing at a rate of 9.8 percent per year between the years of 2010 and 2020. As shown in Table 3.18.1-4 (below), unemployment has dropped significantly for both Dunn and McKenzie Counties.

TABLE 3.18.1-4

Bear Den Project
Project Area Socioeconomic Labor Force Statistics

County	2001	2005	2009	2012 August	Change 2001-2012 (percent)
Dunn County					
Labor Force	1739	1732	1780	4767	174
Employment	1684	1673	1703	4717	180
Unemployment	55	59	77	50	-9
Unemployment Rate	3.2	3.4	4.3	1	-69
McKenzie County					
Labor Force	2708	2694	2910	5977	121
Employment	2637	2593	2812	5908	124
Unemployment	71	101	98	69	-3
Unemployment Rate	2.6	3.7	3.4	1.2	-54

Source U.S. Bureau of Labor Statistics 2012

Housing

The recent increase in population size of both Dunn and McKenzie County has put a strain on the existing housing market and has created a need for additional residences. Table 3.18.1-5 shows the increase in number of residential building permits issued in 2011 as compared to 2005 for each county.

TABLE 3.18.1-5

Bear Den Project
Project Area Residential Building Permit

County	Residential Building Permits 2005	Residential Building Permits 2011	Change 2005-2011 (percent)
Dunn County	4	11	175
McKenzie County	1	28	2700

Source: North Dakota Workforce Intelligence Network 2012.

The Dunn county Comprehensive Plan acknowledges that the increase in oil production has increased the need for housing, but instead of building temporary “man camps,” the county would prefer that a variety of permanent housing be built in the interest of the long-term success of the county. Part of Senate Bill 2371 includes the creation of a fund used to finance new housing in North Dakota’s oil-producing regions offers a tax break to people who contribute to it with the hope of improving the current shortage of housing in the region (North Dakota Office of the Governor, 2011).

Local Government Facilities and Services

The Dunn County Comprehensive Plan also notes that the oil boom has increased the need for government facilities that operate on more of a full time basis. Currently, volunteer operations play a large role in firefighting and paramedic services. Other services such as public school and childcare would also need to grow to serve the growing population (Dunn County Comprehensive Plan). McKenzie County also has limited services, offering one hospital, three full time Police Department personnel, and a volunteer fire department. McKenzie County recently received a grant totaling over $1 million to be used by local government facilities such as fire departments, the police force, and emergency responders to update their facilities and equipment to better serve the growing population (McKenzie County Economic Development). The grants came from Oil Impact Funding and were awarded by the North Dakota Department of Trust Lands. Dunn County received a quarter million dollar grant to pay for water trucks for dust control and to aid the volunteer fire department (North Dakota Department of Trust Lands).

Local Fiscal Conditions

The state of North Dakota taxes pipelines by first determining the full value of the pipeline. The taxable value is found by determining the assessed value (half of the full value) and taking 10 percent of that value. The taxable value is subject to a county mill rate which is the property tax owed for that pipeline. The revenue from property taxes is a large source of income for the county (North Dakota Department of Commerce).

3.19 Land Use, Range Management, and Recreation

3.19.1 Affected Environment

The Project would be located within the Little Missouri Badlands and the Missouri Plateau of the Northwestern Great Plains Ecoregion. Existing land characteristics along the proposed Project route consist of prairie lands, crop lands, shrub lands, badlands, canyons, wetlands, and flood plains. The Project would cross lands under the regulatory control of the COE and lands managed by the USFS, the BLM, and NDTL, as well as private lands.

Oil and gas development began in the area in the 1950s, and exploration and production of oil began to increase considerably in Dunn County around 2005, and in McKenzie County around 2007 (North Dakota Department of Mineral Resources [NDDMR] 2012). At the end of 2012, there were approximately 1,500 wells operating in McKenzie County, and approximately 950 operating wells in Dunn County (NDDMR, 2012). Along with active wells, infrastructure in the area consisting of gathering systems and midstream transportation pipelines are operational or are being planned/permitted/constructed to support the increase in oil and gas production.

There are no designated recreational areas in the Project area. Recreational opportunities in the Project vicinity could include wildlife viewing, hunting, fishing, hiking, camping, snowmobiling, and off-road vehicle (ORV) use.

Land cover within the Project area is listed by vegetation cover type in Table 3.7.1-1. Prairie lands (approximately 67 percent) and cultivated crop lands (approximately 15 percent) are the primary land types that would be affected by the Project. Much of the prairie land is suitable as rangeland for cattle and/or bison.

3.20 Access and Transportation

3.20.1 Affected Environment

The proposed pipeline route would intersect 21 roads, with 4 of those being major roads. For the purpose of this discussion, a road is considered major if the North Dakota Department of Transportation (NDDOT) kept records of the daily traffic flow during the year 2012. Table 3.20.1-1 shows the traffic levels for major roads and highways that would be crossed by the pipeline.

TABLE 3.20.1-1

Bear Den Project
Average Daily Traffic in 2012 for Major Roads Crossed by the Pipeline [a]

Road	Average Daily Traffic	Average Daily Commercial Truck Traffic [b]
15th Street	30	0
22nd Street	45	0
23rd Street	240	0
120th Avenue	155	0

[a] Extrapolated from NDDOT data
[b] Approximately 84 trucks currently travel to the project area daily to transport oil and water

Materials for construction would be transported by truck to areas established for construction headquarters and material storage. There would be three staging areas associated with the Project, located as follows:

- Township 149 North, Range 98 West, SW1/4 SW1/4 Section 29 off of 125th Avenue NW
- Township 147 North, Range 97 West, SW1/4 SE1/4 Section 11, off of 117th Avenue NW
- Township 147 North, Range 96 West, NE1/4 NW1/4 Section 16, off of 111th Avenue NW

3.21 Public Safety

3.21.1 Affected Environment

The State of North Dakota's Enhanced Multi-Hazard Mitigation Plan (Mitigation Plan) identifies major hazards that could threaten the people, property, and economy of North Dakota. Of those identified, hazardous material release and wildland fires were listed as moderate hazards, and transportation accidents were listed as low hazards. These 3 hazards could pose a threat to public safety during the construction and/or operation of the Project.

Crude oil is considered a hazardous material and is regulated by the USDOT when it is in transit through a pipeline. Hazardous materials are described more fully in Section 3.17, Hazardous or Solid Waste. The EPA has determined that an oil spill be deemed harmful to the public or the environment, when it violates water quality standards, causes a film or discoloration of surface water, or causes a sludge to be deposited on land or beneath the water surface. Any oil discharge that meets any of those qualifications must be federally reported. If a hazardous substance is released in an amount greater than or equal to its reportable quantity, it also must be federally reported. The EPA's NRC receives all reports of oil and hazardous substance releases when a release requires federal notification. Between 1997 and 2006, the NRC responded to 1 hazardous material release related to pipelines in Dunn County, and 11 in McKenzie County.

Wildland fires were identified by the Mitigation Plan as being common in North Dakota, with more than 600 wildfires occurring annually, and result almost entirely from some form of human activity. Wildfire season for North Dakota is April 1st through October 31st, with a peak season of September 1st-October 31st.

Transportation accidents in North Dakota are primarily small and tend to not have much of an effect on the community as a whole. Both Dunn and McKenzie County were identified as being areas of low transportation hazard in the Mitigation Plan. Increased traffic due to oil exploration and production has been identified as a concern in the area by the Montana Department of Transportation. High levels of truck traffic have put a strain on the existing road infrastructure; however, many road improvements have been made in recent years to help alleviate this strain. The current conditions of traffic and roads are more fully described in Section 3.20, Access and Transportation.

4.0 ENVIRONMENTAL EFFECTS

4.1 Air Quality

4.1.1 Direct and Indirect Effects – Air Quality

Construction

Emissions of criteria pollutants are expected during the construction phase; however, these emissions would be temporary and are not expected to contribute or cause a violation of the NAAQS. Activities that would produce emissions during construction include the combustion of diesel fuel in construction equipment, worker travel to and from the construction site, and fugitive dust emissions from equipment operating on unpaved roads and disturbed areas, specifically from exposed soils associated with project construction within the ROW, TWS, and ATWS.

GHG emissions would result from the combustion of diesel fuel in various pieces of construction equipment and from worker travel to and from the construction site. Emissions of GHG's associated with construction activities for the Project are likely to be under the 25,000 metric tons per year threshold to be considered for further quantitative and qualitative assessment (CEQ, 2010). The amount of GHG emissions released during construction are expected to minimally contribute to national and statewide GHG emission inventories, therefore, impacts to air quality resulting from the production of GHG emissions during construction are considered negligible.

Operation

There is one central storage facility associated with the Project that would receive the crude oil and produced water for transfer or temporary storage. Emission sources at the facility include:

- two 840,000 gallon crude oil storage tanks;
- two 21,000 gallon used oil tanks;
- two 21,000 gallon produced water tanks;
- one 365 horsepower (hp) emergency generator;
- one 282 hp emergency generator;
- one 50 MMBtu/hr hot oil heater;
- one 150 gallon antifreeze storage tank;
- one 150 gallon lube oil storage tank;
- one 420,000 gallon fire water storage tanks; and
- various processes which have the potential to emit fugitive emissions including: meters, flanges, compressor seals, open ended lines, and relief valves.

Table 4.1.1-1 below lists estimated criteria pollutant emissions from the equipment located at the facility.

TABLE 4.1.1-1

Estimated VOC Emissions from Receipt Facility Storage Tanks
Losses Per Tank Type (pounds per year)

Tank Type	Rim Seal Losses	Withdrawal Losses	Deck Fitting Losses	Deck Seam Losses	Total Annual VOC Emissions
Crude Oil Tank (840,000 gallons)	0.00	0.00	0.00	2.26	0.00
Crude Oil Tank (840,000 gallons)	0.00	0.00	0.00	2.26	0.00
Used Oil Tank (21,000 gallons)	0.00	0.00	0.00	<0.01	0.00
Used Oil Tank (21,000 gallons)	0.00	0.00	0.00	<0.01	0.00
Produced Water Tank (21,000 gallons)	0.00	0.00	0.00	<0.01	0.00
Produced Water Tank (21,000 gallons)	0.00	0.00	0.00	<0.01	0.00
Emergency Generator (398 hp)	0.00	0.16	0.02	0.01	0.00
Emergency Generator (282 hp)	0.00	0.11	0.10	0.01	0.00
Hot Oil Heater (50 MMBtu/hr)	0.13	20.94	17.59	1.15	1.59
Fugitives	0.00	0.00	0.00	0.06	0.00
Antifreeze Storage Tank (150 gallon)	0.00	0.00	0.00	<0.01	0.00
Antifreeze Storage Tank (150 gallon)	0.00	0.00	0.00	<0.01	0.00
Lube Oil Storage Tank (150 gallons)	0.00	0.00	0.00	<0.01	0.00
Lube Oil Storage Tank (150 gallons)	0.00	0.00	0.00	<0.01	0.00
Fire Water Storage Tank (420,000 gallons)	0.00	0.00	0.00	0.00	0.00
Diesel Storage Tank (1,000 gallons)	0.00	0.00	0.00	<0.01	0.00
Diesel Storage Tank (500 gallons)	0.00	0.00	0.00	<0.01	0.00
Total	**0.13**	**21.21**	**17.71**	**5.85**	**1.59**

Fugitive emissions other than those listed in Table 4.1.1-1 are likely to occur outside of the facility as a result of the proposed Project. Fugitive emissions outside of the fence line would be considered negligible and are unlikely to cause or contribute to a violation of the NAAQS or SAAQS and were therefore not quantified in this EA. Project facilities outside of the storage/transfer facility fence line with associated fugitive emissions are:

- the pig receiver assembly at the terminus of the crude oil delivery lateral pipeline at Line AR-16;
- the automated wellhead facilities at each of the 31 well pad sites;
- the pig launcher and receiver site at Line AR at MP 0.0;
- the automated block valve site at Line AR-30 at MP 11.0;
- the 35 lateral pipeline interconnect sites located at each of the gathering pipeline lateral interconnects; and
- the intermediate block valve sites located at Line AR at MP 7.0, Line AR-14 at MP 0.4, and Line AR-30 at MP 1.2.

More detailed descriptions regarding the project facilities can be found in Section 2.1.1.

Currently, the crude oil and produced water is transported by heavy duty diesel trucks via surface public and leased roads. Though some air emissions would occur as a result of the operation and maintenance of the Project an overall decrease in current levels of air emissions is expected as the need to haul the material from the wells using heavy duty diesel trucks would be eliminated. A total of 84 trucks, each traveling 136 miles round trip for a total of 11,424 miles per day, would be replaced by the newly constructed pipeline. Using figures from a similar project the estimated pollutant reductions expected on a per truck basis, daily basis, and annual basis have been calculated and are listed below in Table 4.1.1-2.

TABLE 4.1.1-2

Estimated Emissions Reductions from Reduced Truck Traffic

Pollutant	Tons/Truck-day	(Tons/Day)	(Tons/Year)
NO_X	9.74E-04	8.18E-02	29.87
CO	2.96E-03	2.48E-01	90.69
SO_2	1.97E-06	1.66E-04	0.06
VOC	7.04E-04	5.91E-02	21.58
Benzene	1.43E-05	1.20E-03	0.44
Toluene	1.05E-05	8.85E-04	0.32
Ethylbenzene	2.18E-06	1.83E-04	0.07
Xylene	7.46E-06	6.27E-04	0.23
Formaldehyde	8.33E-05	7.00E-03	2.55
n-Hexane	1.12E-06	9.42E-05	0.03
CO_2	2.26E-01	1.90E+01	6,932.23
CH_4	9.30E-06	7.81E-04	0.29
N_2O	1.85E-06	1.56E-04	0.06
CO_2e	2.26E-01	1.90E+01	6,932.23

Climate Change

Generally, climate change is measured on a global scale and it is difficult to determine the impacts a specific project would have on global temperatures and weather. However, the operational phase of the Project should experience an overall decrease of GHG emissions due to the replacement of tanker trucks with pipeline. GHG emissions associated with the Project would contribute minimally to the state and nationwide inventories.

4.1.2 Mitigation – Air Quality

Construction

Air emissions would be mitigated by the application of dust suppressants (water) to access roads and the active construction ROW to reduce fugitive dust particles. In addition, routine maintenance and servicing would be required on all contractor vehicles to ensure they operate with acceptable emissions outputs.

Operation

All emissions related to operations of the facilities would be properly permitted and maintained in compliance with the appropriate permits and regulations.

4.2 Noise

4.2.1 Direct and Indirect Effects - Noise

Construction

The nearest noise receptor, an industrial or agricultural use area, is approximately 370 feet from the construction ROW and aboveground facilities. Noise resulting from construction activities would be short-

term (2 to 3 weeks in any given area) in duration and limited to daylight hours. Based on construction noise analyses conducted for other pipeline projects (EPA, 1974), noise levels of 60 dBA or above could extend perpendicularly up to 12,000 feet (2.5 miles). These levels could occur sporadically over the construction period, and the zone of impact would be limited to the local area of construction activities as construction activities progress along the construction ROW. The terrain along portions of the Project route is more diverse and occasionally would pass through areas where the terrain enhances the noise levels during construction. As a result of the short duration of construction (approximately 4 months), the daylight-only construction period, and generally rural alignment of the construction ROW, noise levels should not be overly disruptive.

Operation

Operation-related noise would be limited to the storage/transfer facility where tanker trucks would be periodically loading produced and other water at storage tanks as well as to support vehicles and equipment that would be used by maintenance personnel. Additional periodic noise would occur when emergency backup generators, which are located at the proposed storage/transfer facility, are used during power outages or other periods of time when required. The noise associated with the use of backup generators to provide temporary power to the storage/transfer facility is assumed to be minimal and sporadic. The closest residence is located more than 3,800 feet from the storage/transfer facility and only three residences are located within 7,000 feet of the storage/transfer facility. Impacts to these residences are not anticipated as a result of operational activities.

4.2.2 Mitigation – Noise

All equipment and vehicles would be equipped with mufflers and properly maintained to minimize any noise emissions.

4.3 Geology and Minerals

4.3.1 Direct and Indirect Effects - Geology

Construction

Construction activities would include disturbances to the topography along the Project route and at associated aboveground facilities due to grading and trenching that may result in slope instability. Since the Project route crosses landslide prone areas on either side of the Little Missouri River crossings and within the Sentinel Butte badland topography, construction activities could result in instability through undercutting of slopes or changes in drainage and surface flow.

Construction over undetected underground mining voids could pose dangers for construction workers, result in loss of equipment, and potentially pose a threat to shallow groundwater through spills of fuel and lubricants.

Blasting is not anticipated for the Project. If hard bedrock is encountered it can be disaggregated by using rippers, trenchers, or other equipment.

Operation

As previously identified, landslide areas would be crossed by the Project route. Operation of the Project would not alter the geological and physiographic conditions.

Mine subsidence has the potential to create ground instability with a risk of damaging the proposed pipeline, disruption of service, and possible contamination from leaks.

Because there are no identified active faults along the Project route, no impacts due to ground deformation caused by fault movement would be expected. The Project would be in an area not likely to experience strong ground motion during a maximum credible earthquake, therefore impacts due to ground motion would not be anticipated.

4.3.2 Direct and Indirect Effects – Minerals

Construction

As described above, the Project route would cross active oil and gas fields. In addition, the Project route may cross aggregate resources (e.g., gravel, sand) in alluvial valleys and river terraces. Nevertheless, construction would have very minor and short-term impacts to current mineral extraction activities due to the temporary and localized nature of pipeline construction activities. Construction of the Project would not be expected to impact gravel mining operations.

It is possible that non-project related oil and gas wells may be close to the Project route and surface facilities. Construction activities potentially could damage wells, associated underground fluid lines and pipelines, and disrupt normal operations and routine maintenance. Also, damage to oil and gas facilities, should it occur, could present health and safety and contamination hazards. Abandoned wells also could be impacted because construction potentially could remove existing abandoned well markers and damage near surface cement plugs. Because oil and gas are produced at depths considerably deeper than the excavation depth, construction of the Project would not be expected to affect the oil and natural gas producing formations. Rather, any construction-related impacts would be limited to surface or near-surface components of the wells and gathering systems, which would temporarily disrupt production until repairs are made.

Operation

The primary issues of concern regarding mineral resources and operation of the proposed pipeline are the potential for reduced access to underlying minerals and interference with future mineral extraction operations.

Long-term operation of a pipeline has the potential to preclude access to mineral resources. Overall, the Project does not pose a hindrance for accessing oil and gas resources. With the current propensity to drill horizontal laterals or directionally drill wells to access oil and gas resources, the proposed pipeline would not restrict access to those resources. Although the Project would be within an area of coal and uranium resources, no current plans to mine such resources along the Project route were identified.

Additionally, impacts to future mineral development would not constitute a substantial loss of mineral resource or mineral availability because of the narrow, linear nature of the pipeline ROW relative to the expanse of areas with mineral resource potential. The pipeline trench would be backfilled with materials derived from the trench excavation, and it might be necessary to obtain some construction sand and gravel from local, existing commercial sources for use as pipe padding, road base, or surface facility pads. These demands for sand and gravel would not affect the long-term availability of construction materials in the area.

4.3.3 Mitigation – Geology and Minerals

Construction of the Project would not worsen unfavorable geologic conditions in the area, and it is unlikely that the project facilities would suffer significant damage from geologic hazards or other naturally occurring events. Construction of the Project would not impede recoverable mineral activities in the Project area. In the event that blasting were required in areas with hard bedrock, blasting plans would be developed that meet or exceed applicable regulations. CEBCS has identified 50 locations along the Project route that may be prone to subsidence or landslides. CEBCS would plan to bore these unstable slopes to minimize the potential for slumping or creating long-term stabilization issues. Although unknown historic mines are not anticipated along the Project route, if one is encountered during construction then appropriate measures would be taken to secure the pipeline from the risk of damage and notify the appropriate landowner of the discovery.

4.4 Soil Resources

4.4.1 Direct and Indirect Effects – Soil Resources

Soil characteristics such as susceptibility to erosion and the potential for revegetation are important to consider when planning for construction activities and stabilization of disturbed areas. These hazards or limitations for use are a function of many physical and chemical characteristics of each soil, in combination with the climate and vegetation.

Activities associated with the Proposed Action (e.g., clearing, grading and trenching) would remove protective vegetative cover from the affected soils thereby accelerating the erosion process. Grading, trenching, and backfilling activities associated with pipeline construction could cause mixing of the soil horizons which could result in reduced soil fertility and reduced revegetation potential.

Several soil types (68 percent, see Tables 3.4.1-1 and 3.4.1-2) are coarse-textured and moderately to excessively drained; and therefore would prove difficult to revegetate upon the completion of construction.

Construction equipment, increased vehicle use, and removal of vegetation could cause surface soil compaction that could lead to lower absorption levels and increases in surface runoff and sedimentation. Water erosion of soils associated with construction activities could result in a net loss of valuable topsoil by sheet, rill, and gully erosion.

Any leaks or spills of hazardous substances (e.g. diesel fuel) could compromise the productivity of affected soils. Because pipelines are buried, soil absorption of spilled crude oil or produced water could occur, thus impacting the soils. If crude oil or produced water is released in soil at pipeline depth, the released substances can volatize, sorb to soil particles, constituents can dissolve into the groundwater, or remain in residual form (AECOM, 2013). The movement of crude oil across the soil surface is governed by slope, soil permeability, and, to a lesser extent, ambient temperature. Subsurface releases to soil tend to disperse slowly and are generally located within a contiguous and discrete area, often limited to the less consolidated soil (lower soil bulk density) within the pipeline trench (AECOM, 2013). The majority of volatile hydrocarbon fractions would evaporate quickly from pooled oil on the soil surface (AECOM, 2013). The rates of evaporation are primarily controlled by soil porosity and soil temperature. Crude oil would usually bind most strongly with soil particles in organic soils; crude oil would usually bind less strongly with soil particles in sandy soils. If crude oil was released into sandy soils along the Project area, it would likely become visible to aerial surveillance due to product on the soils surface or discoloration of nearby vegetation, which would facilitate emergency response and soil remediation efforts (AECOM, 2013). With time, soil microorganisms capable of consuming crude oil generally increase in number and the biodegradation process naturally remediates the previously contaminated soil (AECOM, 2013). It is difficult to precisely estimate the volume of soil that might be contaminated in the event of a spill. Site-specific environmental conditions (i.e., soil type, weather conditions) and release dynamics (i.e., leak rate, leak duration) would result in substantially different surface spreading and infiltration rates, which in turn, affect the final volume of affected soil to be remediated (AECOM, 2013). Based on historical data, soil remediation involved 100 cubic yards of soil or less at the majority of spill sites where soil contamination occurred, and only 3 percent of the spill sites required remediation of 10,000 cubic yards or more (AECOM, 2013). Productivity of soils would be compromised until cleanup and reclamation efforts are successful. Decreased soil productivity would hinder reclamation efforts and leave soils further exposed to erosional processes.

4.4.2 Mitigation – Soil Resources

To mitigate soil erosion and potential increased sedimentation and salt leaching, all disturbed areas affected by the Proposed Action shall be reclaimed as quickly as possible and as close to their original condition as possible. Interim reclamation at project locations along the pipeline ROW would follow the applicable Conditions of Approval outlined in the 2001 LRMP for the Dakota Prairie Grasslands and as identified in the Plan of Development (POD) and the CRMP (POD Appendix E) including:

- When preparing the site, all suitable topsoil would be removed from the full ROW to avoid pulverization or rutting during wet periods and would be stored in a separate pile from sub-soil until reclamation occurs.
- If topsoil is expected to be stored for more than six months, BLM requires that stored soils have an erosion fabric installed to protect it from wind and water erosion.
- Spills and leaks, once detected, would be cleaned up by removing contaminated soil and replacing it with clean soil or by bioremediation onsite. This would occur depending on the volume of the spill, under direction of the BLM or USFS when on federally administered lands.
- Slopes within the disturbed area shall be stabilized by non-vegetative practices designed to hold the soil in place and minimize erosion. Vegetative cover shall be reestablished to increase infiltration and provide additional protection from erosion.
- When erosion is anticipated, sediment barriers shall be constructed to slow runoff, allow deposition of sediment, and prevent it from leaving the site.
- Disturbed areas shall be restored as nearly as possible to its original contour.
- Fill materials shall be pushed into cut areas and up over backslopes. Leave no depressions that would trap water or form ponds, except on steep slopes where pocking would be used to minimize erosion and create micro habitats for soil collection and enhanced seed germination.
- Topsoil would be distributed evenly over the location and prepare a seedbed by using a disk, field cultivator, drag rake, or similar implement. Drill seeding would be accomplished on contour at a depth no greater than ½ inch. In areas that cannot be drilled, broadcasting at double the seeding rate and harrowing seed into the soil would be performed.
- Seed that is certified or registered by the state of North Dakota (or the state of origin) would be used. Seed certification tags would be submitted to the BLM Authorized Officer (AO) and USFS McKenzie Ranger District prior to seeding efforts.
- Surveys identifying and quantifying noxious weeds and non-native invasive plant species would be performed prior to disturbance within the area of direct and indirect use (project disturbance and a 200 foot buffer), including all access roads, pipelines, or other associated surface disturbance.

4.5 Surface and Ground Water

4.5.1 Direct and Indirect Effects – Surface and Groundwater

4.5.1.1 Surface Water

Construction

A total of 61 waterbodies occur within the construction ROW of the Bear Den Project: 1 spring, 24 perennial waterbodies, 35 intermittent waterbodies, and 1 ephemeral waterbody. The proposed route crosses the Little Missouri River at two locations as well as other perennial waterbodies in the project area. Crossing methods including HDDs and open-cut crossings are discussed in Section 4.6.

The construction and permanent ROW where a single pipeline is proposed would be 60- and 50-feet wide, respectively, through wetlands and waterbodies. Where two pipelines are proposed, the construction and permanent easement ROW would be 75 and 50 feet, respectively, through wetlands and waterbodies. Because of the reduced construction ROW width, ATWS would be needed to facilitate equipment turnarounds, parking areas, pipe and pipe fitting storage, and steep slope construction, as well as for segregating topsoil and assuring the safe handling of materials and operation of equipment. Vegetation buffers of appropriate width would be left between ATWS and waterbodies and wetlands.

In areas where HDDs are not employed, the temporary construction ROW would be cleared of trees and obstructions and graded to provide a relatively flat surface to accommodate construction equipment, while preserving natural drainage to the extent possible. CEBCS anticipates stripping topsoil over the full ROW width through most of the Project area. Any conserved topsoil and excavated soils would be stockpiled along one side of the ROW allowing the other side to be used for access, material transport, and pipe assembly. After grading, the pipeline trenches would be dug in sequence, and at stream and wash crossings, the trench would be a minimum of 6 feet below the streambed or, if not viable, at a depth deep enough to minimize the environmental impacts to the streambed. Pipe trench backfill would generally consist of the material originally excavated from the trench. During backfilling, procedures would be implemented to minimize erosion, to restore the natural contour of the ground, and to allow normal surface drainage. After construction of the pipeline is completed, permanent soil stabilization efforts in uplands may include construction of water bars and/or silt barriers along surface contours of the disturbed area, which would direct runoff away from any waterbody and into areas of low erosion potential.

After the trench is backfilled, the pipeline would be pressure-tested with water according to DOT specifications to ensure structural integrity. It is anticipated that hydrostatic test water would either be collected and hauled off to an approved disposal facility or discharged overland along the edges of the construction ROW using energy dissipation devices to minimize erosion and sedimentation. Some test water could be reused for testing more than one section of pipe. Sources, volumes, and discharge locations of hydrostatic test water are identified in CEBCS' Hydrostatic Test Plan (POD Appendix P).

Proposed Project activities including any clearing, grading, and soil stockpiling could temporarily change natural surface water recharge patterns. Construction equipment, increased vehicle use, and removal of vegetation could cause surface soil compaction which could in turn lead to lower absorption levels and increases in sedimentation and surface runoff to surface waters in the Little Missouri River systems. The level and extent of the potential impacts would depend on a variety of factors including; soil type, soil depth, slope, vegetation, and the timely implementation and success/failure of mitigation measures.

Potential construction impacts to surface water would depend on the construction techniques employed and the physical characteristics of the streams and watersheds crossed by the Project route. Construction of the Project could affect surface water in several ways. Clearing, grading, trenching and soil stockpiling activities could temporarily alter overland flow. Surface soil compaction caused by the operation of heavy equipment could reduce the soil's ability to absorb water, which could increase surface runoff and the potential for ponding. These impacts would be localized and temporary. Areas of disturbance adjacent to and directly upslope of streams might contribute to temporary impacts of surface water through increased rates of erosion that contribute sediment to the streams during storm runoff

events. Other temporary impacts, mainly in the form of erosion and sedimentation effects on surface water quality, would be generally expected from land disturbance during construction.

4.5.1.2 Groundwater

Construction

Impacts, if any, to groundwater resources would be temporary and limited to that portion of a groundwater system that is near or within the Project construction work area. Construction and operation of the Project is not expected to adversely affect groundwater resources in the Project area or its vicinity. Blasting is not anticipated as a means for trench excavation. No measurable alteration of aquifer recharge should occur. The trench excavated for pipe placement would be above the water table along the proposed ROW in most locations, with the exceptions of surficial alluvial aquifers along streams and shallow glacio-fluvial aquifer zones. Portions of the route in the immediate vicinity of these features may encounter shallow groundwater during excavation. Following backfilling of the trench, these areas would be returned to their original condition, and groundwater impacts would not be expected. No unpermitted withdrawals of groundwater would occur. Therefore, impacts to groundwater resources due to construction of the Project are not anticipated.

Some dewatering of construction areas and the pipeline trench may occur; however, relatively small volumes are expected and effects on the overall groundwater system would be small and temporary. Because of the relatively small amount of water removed, the short duration of the activity, and the local discharge of the water, groundwater levels would quickly recover after pumping stops. If temporary dewatering of groundwater is required during construction activities, trench water would be discharged in compliance with a National Pollutant Discharge Elimination System (NPDES) permit.

At perennial stream crossings where HDD is employed, inadvertent releases of drilling fluids and lubricants through seepage may occur, which sometimes can reach surface water or shallow groundwater. Development and implementation of CEBCS' Horizontal Directional Drill and Contingency Plan (POD Appendix G) would reduce the potential for these impacts by necessarily including measures to address these types of occurrences and the nature of the materials potentially involved.

Local groundwater could also be impacted if any leaks or spills of hazardous materials during construction or operations and maintenance (O&M) are not identified and rectified in a timely manner and are thus able to infiltrate soils. If local groundwater is impacted it could then contaminate nearby surface water if recharge is occurring. Given implementation of CEBCS' SPCC Plan, short and long-term impacts to groundwater resources would be greatly reduced or eliminated. Impacts to bedrock aquifers are not expected.

Operation and Maintenance

During operations, impacts to surface water resources would occur if a pipeline leak or rupture released crude oil or produced water. The severity and duration of such an impact would depend on its location, the volume of material released, and the spill response and countermeasures implemented. If released into water, the crude oil or produced water will float to the water's surface. If left on the surface, some constituents of the oil will evaporate, others will dissolve, and eventually some materials may sink as sedimentation occurs (AECOM, 2013). A crude oil or produced water leak will eliminate ecosystem function of the waterbody until it has been removed or disintegrate.

Crude oil or produced water could be released to water resources if the pipeline is breached or leaks occur. To establish the potential for a spill, baseline resultant incident frequencies were calculated from historical national pipeline incident data associated with earlier (i.e., the 1970s or earlier) pipeline design and construction methods that often do not meet the current best management standards. Consequently, the spill frequency is considered extremely conservative and over-estimates the perceived probability of a spill. The resultant incident frequency for a pipeline leak is 8.83E-04 (or 0.000883) incidents/mile-year, equivalent to one incident in 1,100 years per mile of pipe (AECOM, 2013). Based on the spill frequency and a total of 129 miles of pipeline, which conservatively considers both the crude oil pipeline and associated produced water pipeline mileage, this analysis estimates that there could be 1.1 spills during a

10-year period (AECOM, 2013). The chance of a spill occurring at any specific waterbody along the pipeline is low (AECOM, 2013). Of the 1.1 spills postulated to occur during a 10-year period, about 0.007 spills would be expected to occur within a waterbody (equivalent to no more than one spill every 1,416 years)(AECOM, 2013). If any release did occur, it is likely that the total release volume of a spill likely would be three barrels or less based on historical spill volumes (AECOM, 2013). The Pipeline Risk Assessment and Environmental Analysis (PRAECA) report (AECOM, 2013) provides additional information regarding impacts to water resources and an analysis of the likelihood and potential magnitude from a potential spill event.

Ground water aquifers underlie the proposed project. Vulnerability of these aquifers is a function of the depth to groundwater and permeability of the overlying soils. While routine operation of the Project would not affect groundwater, there is the possibility that a release could migrate through the overlying surface materials and enter a groundwater system. Depending on soil properties, the depth to ground water, and the amount of crude oil in the unsaturated zone, localized groundwater contamination can result from the presence of free crude oil and the migration of its dissolved constituents. Crude oil is less dense than water and would tend to form a floating pool after reaching the groundwater surface. Movement of crude oil is generally quite limited due to adherence with soil particles, ground water flow rates, and natural attenuation (i.e. microbial degradation).

4.5.2 Mitigation – Surface and Ground Water

The potential for impacts to waterbodies would be minimized by the implementation of Best Management Practices (BMPs), including preparation and implementation of a SPCC Plan. The SPCC Plan addresses preventive and mitigation measures that would be used to avoid or minimize the potential impact of hazardous material spills during construction as well as operation of the system. CEBCS would implement a Construction, Reclamation, and Monitoring Plan (POD Appendix D) during construction to minimize the possibility of erosion. Additionally, as stated above, both temporary and permanent erosion control structures would be installed during construction to minimize the potential for soil loss due to wind and water erosion. Temporary erosion and sediment control BMPs would be installed across the entire width of the construction ROW as needed. No silty/turbid discharge water from the trench dewatering operations would be allowed to enter any waterbody or wetland.

The Project would be designed and constructed so it would not impede the flow of any waterway. The Project pipelines would be installed below the bed of the waterway, at a level so the channel bed gradient does not change. CEBCS plans to cross a total of 40 waterbodies using the HDD crossing technique, which will generally avoid surface disturbance and direct impacts to those waterbody features. These HDDS include both crossings of the Little Missouri River. Where implemented, HDD crossings would minimize the potential for impacts from stream crossing construction. Temporary impacts would be most likely to occur during open-cut construction at flowing intermittent streams. Trench excavation at perennial streams or intermittent streams with streamflow at the time of construction would result in increases of sediment available for transport by the water. This would temporarily result in elevated levels of total suspended sediment (TSS) and increases in turbidity at and downstream from the stream crossing. TSS and turbidity levels would be expected to recover within several days after the completion of in-stream construction activities.

During construction, the pipeline would be pressure tested with water or air in the pipeline to ensure the system is capable of withstanding the operating pressure for which it was designed. Water for pressure testing would be obtained from municipal or commercial sources and in accordance with federal, state, and local regulations. Internal test pressure and durations would be in accordance with Title 49 CFR Part 195. Environmental impacts from withdrawal and discharge of hydrostatic test water would be minimized by applying the measures in CEBCS' Hydrostatic Test Plan. The use of specific construction practices would prevent further water quality impacts to these waterbodies from the discharge of hydrostatic test water.

Periodic ground and aerial inspections of the route by CEBCS O&M personnel should detect areas of erosion (i.e., formation of gullies, deposition of sediment, etc.) and uncontrolled runoff (i.e., berm washouts) before significant impacts occur. In addition, O&M personnel would conduct annual

inspections during the summer of the first five years following reclamation to assess the condition of the ROW and the effectiveness of the erosion control measures. In association with erosion control and runoff inspections, CEBCS representatives would visually assess the condition of bed and bank stabilization measures installed during restoration at the waterbody crossings. In addition, a number of dry washes that drain into high quality streams off-site would also be assessed for bed and bank stability.

Water quality could be impacted if construction equipment and vehicles leaked or spilled petroleum products, lubricants, solvents, or other hazardous materials into or near waterbodies. Pipeline safety provisions and monitoring procedures and equipment would minimize the potential for such impacts during operations. Protective measures are presented in the Project SWPPP and SPCC Plan provided as separate appendices to the POD. Per CEBCS' SPCC Plan, vehicles would be maintained and operated so as to prevent accidental leaks or spills. To minimize adverse environmental impacts from spills, the following measures would be taken:

- All spills would be reported immediately to the environmental inspector (EI) who would direct cleanup efforts and notify appropriate agency officials.
- Some construction equipment and all refueling trucks would be equipped with spill control kits (e.g., shovels, plastic bags, portable bags, portable dams, absorbent material, etc.).
- Accidental leaks would be cleaned up immediately, and contaminated material would be disposed of at an approved facility.
- Servicing, refueling, and storing of fuels and lubricants would occur in the ROW, staging areas, or off-site at an appropriate facility and would not occur within 100 feet of any ephemeral or perennial streams. Used oil or unused lubricants would be stored in appropriate containers, removed from the site regularly, and disposed of at an approved facility. Service truck operators would not allow residual fuels or lubricants to drain on the ground.
- When not in use, construction equipment would be stored in staging areas or off-site at appropriate facilities.

The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system, during operation, the pipelines would be monitored 24 hours a day, 365 days a year using a sophisticated Supervisory Control and Data Acquisition (SCADA) system. This system would provide real time data used to detect leaks and allow CEBCS to initiate a system shutdown if a leak is detected. In addition, direct observation of the ROW will occur approximately once every two weeks. These monitoring efforts would include aerial surveys, ground surveys, and a public and landowner awareness program for leak detections. The PRAECA report (AECOM, 2013) provides additional information regarding mitigation measures for leak detection during operation.

4.6 Wetlands and Riparian Zones

4.6.1 Direct and Indirect Effects

The impact analysis area for wetland and floodplain resources encompasses the Project Area. The primary issues associated with wetland resources include direct and/or indirect impacts to wetlands and floodplains, and impacts associated with the potential introduction and/or spread of noxious weed species and potential for accidental oil spills.

Based on the NWI data and NRG's review of WEST's Wetland Survey Report, construction and operation of the Project would primarily affect PEM wetland types (see Table 4.6.1-1 below).

TABLE 4.6.1-1

Bear Den Project
Wetland Crossing Method and Construction Impacts

Line	Milepost In	Milepost Out	Wetland ID	Wetland Type	Crossing Method [b]	Temporary Construction Right-of-Way Impacts (acres)	Permanent Easement Impacts (acres)	Total Disturbance Impacts (acres)
AR	9.9	9.9	w-mc-b-011	PEM	Open-cut	0.01	0.04	0.05
AR	12.2	12.2	w-mc-b-012	PEM	Open-cut	0.01	0.04	0.05
AR-15/ARW-15	0.4	0.4	w-du-b-008	PEM	HDD	0.00	0.00	0.00
AR-16	0.1	0.2	w-mc-b-013b	PEM	HDD	0.00	0.00	0.00
AR-17/ARW-17	0.3	0.4	w-du-b-014[a]	PEM	Open-cut	0.01	0.00	0.01
AR-19/ARW-19	0.1	0.2	w-du-b-011	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.8	0.8	w-du-b-018a	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.8	0.8	w-du-b-018b	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.8	0.8	w-du-b-018c	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.9	0.9	w-du-b-018d	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.9	0.9	w-du-b-018e	PEM	HDD	0.00	0.00	0.00
AR-20/ARW-20	0.9	0.9	w-du-b-018f	PEM	HDD	0.00	0.00	0.00
AR-21/ARW-21	0.1	0.1	w-du-b-021a	PEM	HDD[b]	0.01	0.00	0.01
AR-21/ARW-21	0.1	0.1	w-du-b-021b	PEM	HDD[b]	0.01	0.00	0.01
AR-22/ARW-22	0.8	0.8	w-du-b-010	PEM	HDD	0.00	0.00	0.00
AR-23/ARW-23	0.5	0.5	w-du-b-006	PEM	Open-cut	0.02	0.03	0.05
AR-24/ARW-24	0.9	0.9	w-mc-c-001a	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	0.9	0.9	w-mc-c-001b	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	0.9	0.9	w-mc-c-001c	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	0.9	0.9	w-mc-c-001d	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	0.9	1	w-mc-c-001f	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	0.9	1	w-mc-c-001g	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	1	1	w-mc-c-001h	PEM	HDD	0.00	0.00	0.00
AR-24/ARW-24	1.1	1.1	w-mc-c-006c	PEM	HDD	0.00	0.00	0.00
AR-25/ARW-25	1.6	1.7	w-mc-b-005	PEM	Open-cut	0.21	0.18	0.39
AR-25/ARW-25	3	3	w-mc-c-007	PEM	HDD	0.00	0.00	0.00
AR-25/ARW-25	0.5	0.5	w-mc-c-011a	PEM	HDD[b]	0.02	0.00	0.02
AR-25/ARW-25	0.8	0.8	w-mc-c-012a	PEM	HDD[b]	0.02	0.00	0.02
AR-25/ARW-25	1	1	w-mc-c-012b	PEM	Open-cut	0.02	0.02	0.04
AR-25/ARW-25	1.2	1.2	w-mc-c-013a	PEM	HDD	0.00	0.00	0.00
AR-25/ARW-25	1.2	1.2	w-mc-c-013b	PEM	HDD	0.00	0.00	0.00
AR-26/ARW-26	0.2	0.6	w-du-b-013a	PEM	Open-cut	1.23	0.91	2.14
AR-26/ARW-26	0.9	0.9	w-du-b-013b	PEM	Open-cut	0.01	0.06	0.07
AR-26/ARW-26	1	1	w-du-b-014[a]	PEM	Open-cut	0.01	0.01	0.02
AR-29/ARW-29	2	2	w-du-b-023a	PEM	Open-cut	0.00	0.04	0.04
AR-29/ARW-29	1.9	1.9	w-du-b-023b	PEM	Open-cut	0.00	0.00	0.00
AR-29/ARW-29	1.8	1.8	w-du-b-024	PEM	Open-cut	0.00	0.05	0.05
AR-29/ARW-29	1.6	1.7	w-du-b-025	PEM	HDD[b]	0.08	0.00	0.08
AR-30/ARW-30	9.4	9.4	w-du-b-015a	PEM	Open-cut	0.12	0.21	0.33
AR-30/ARW-30	6.8	6.8	w-du-b-016a	PEM	HDD[b]	0.01	0.00	0.01
AR-30/ARW-30	6.9	6.9	w-du-b-016b	PEM	Open-cut	0.01	0.00	0.01
AR-30/ARW-30	7.2	7.2	w-du-b-017	PEM	HDD	0.00	0.00	0.00
AR-30/ARW-36	5.1	5.1	w-du-b-019a	PEM	Open-cut	0.02	0.06	0.08
AR-30/ARW-36	5.1	5.1	w-du-b-019b	PEM	Open-cut	0.00	0.00	0.00
AR-30/ARW/36	4.8	4.8	w-du-b-018g	PEM	HDD[b]	0.01	0.00	0.01

TABLE 4.6.1-1 (cont'd)

Bear Den Project
Wetland Crossing Method and Construction Impacts

Line	Milepost In	Milepost Out	Wetland ID	Wetland Type	Crossing Method [b]	Construction Right-of-Way Impacts (acres)	Permanent Easement Impacts (acres)	Total Disturbance Impacts (acres)
AR-30/ARW-36	3.7	3.7	w-du-c-003a	PEM	HDD[b]	0.11	0.00	0.11
AR-30/ARW-36	3.7	3.8	w-du-c-003b	PEM	HDD[b]	0.02	0.00	0.02
AR-30/ARW-36	3.8	3.8	w-du-c-003c	PEM	HDD[b]	0.05	0.00	0.05
AR-31/ARW-31	6.7	6.7	w-du-b-001	PEM	Open-cut	0.04	0.10	0.14
AR-31/ARW-31	6.4	6.5	w-du-b-002	PEM	Open-cut	0.03	0.12	0.15
AR-31/ARW-37	4.2	4.2	w-mc-b-004g	PEM	HDD	0.00	0.00	0.00
AR-31/ARW-37	4.2	4.2	w-mc-b-004h	PEM	HDD	0.00	0.00	0.00
AR-31/ARW-31	4.3	4.4	w-mc-b-010a	PEM	Open-cut	0.01	0.01	0.02
AR-31/ARW-37	2.6	2.6	w-mc-c-002b	PEM	HDD	0.00	0.00	0.00
AR-31/ARW-37	0.1	0.1	w-mc-c-008	PEM	HDD	0.00	0.00	0.00
AR-31/ARW-37	2.3	2.3	w-mc-c-009	PEM	Open-cut	0.01	0.00	0.01
AR-31/ARW-37	2.3	2.3	w-mc-c-010a	PEM	Open-cut	0.01	0.01	0.02
AR-31/ARW-37	2.3	2.3	w-mc-c-010b	PEM	Open-cut	0.01	0.00	0.01
AR-34/ARW-34	2.6	2.6	w-du-b-009a	PEM	HDD	0.00	0.00	0.00
AR-34/ARW-34	2.6	2.6	w-du-b-009b	PEM	HDD	0.00	0.00	0.00
AR-34/ARW-34	2.6	2.6	w-du-b-009c	PEM	HDD	0.00	0.00	0.00
AR-34/ARW-34	2.5	2.5	w-du-b-009d	PEM	Open-cut	0.01	0.02	0.03
AR-35/ARW-35	0.3	0.4	w-mc-b-007	PEM	HDD	0.00	0.00	0.00
AR-35/ARW-35	0.6	0.6	w-mc-b-008	PEM	HDD[b]	0.05	0.00	0.05
AR-30/ARW-30	11.4	11.4	w-du-b-012	PFO	HDD	0.00	0.00	0.00
AR-30/ARW-36	3.7	3.7	w-du-c-004a	PFO	HDD[b]	0.02	0.00	0.02
AR-30/ARW-36	3.8	3.8	w-du-c-004b	PFO	HDD[b]	0.02	0.00	0.02
AR-31/ARW-31	6.2	6.3	w-du-b-003	PSS	Open-cut	0.27	0.28	0.55
AR-31/ARW-31	9.2	9.3	w-du-b-005	PSS	HDD	0.00	0.00	0.00
					Total (acres)	**2.5**	**2.2**	**4.7**

[a] Wetland crosses two lines, AR-17 and AR-26.
[b] HDD requires temporary 15-foot access lane.

Construction

Localized disturbances of wetland and riparian features could cause brief releases of sediment into channels, cause erosion, change channel morphology, displace native or desirable vegetation along channel banks, or disturb the natural function of a seep or spring. Direct and indirect impacts would be avoided or minimized by implementing BMPs and through the avoidance and minimization measures described in CEBCS' POD. With proper implementation of minimization and mitigation measures during construction and operations of the pipeline system, no long-term impacts to wetlands and riparian areas downstream of local disturbance are expected.

Direct impacts from Project-related activities would include the temporary disturbance of approximately 4.7 acres of wetland vegetation, hydric soils, and potential hydrologic functionality as a result of compaction, clearing/trenching/blading of surface cover, and direct removal of aboveground and belowground vegetation and substrate. Indirect impacts as a result of Project implementation may include the potential establishment of noxious weed species in areas of vegetation removal or soil disturbance, in areas where reclamation is unsuccessful or prolonged, or in areas of higher soil erosion or lower vegetative cover. Noxious weed species can be introduced to the Project area via weed-

contaminated vehicles, equipment, and erosion control devices (e.g., straw bales) and, if not controlled, can displace native plant species, rendering infested areas unproductive.

Operation

Crude oil or produced water could be released into wetlands if the pipeline is breached or leaks occur. If an accidental spill were to occur within a wetland during operation, CEBCS would employ a facilities specific spill prevention, contingency plans, and SPCC Plan. If released into water, the crude oil or produced water would float to the surface. If left on the surface, some constituents of the oil would evaporate, others would dissolve, and eventually some materials may sink as sedimentation (AECOM, 2013). A crude oil or produced water leak would eliminate ecosystem function of the affected wetland until it has been removed or disintegrate as described above.

To establish the potential for a spill, baseline resultant incident frequencies were calculated from historical national pipeline incident data associated with earlier (i.e., the 1970s or earlier) pipeline design and construction methods that often do not meet the current best management standards. Consequently, the spill frequency is considered extremely conservative and over-estimates the probability of a spill. The resultant incident frequency for a pipeline leak is 8.83E-04 (or 0.000883) incidents/mile-year, equivalent to one incident in 1,100 years per mile of pipe (AECOM, 2013). Based on the spill frequency and a total of 129 miles of pipeline, which conservatively considers both the crude oil pipeline and associated produced water pipeline mileage, this analysis estimates that there could be 1.1 spills during a 10-year period (AECOM, 2013). The chance of a spill occurring at any specific wetland or riparian area along the pipeline is low (AECOM, 2013). Of the 1.1 spills postulated to occur during a 10-year period, about 0.007 spills would be expected to occur within wetland or riparian areas (equivalent to no more than one spill every 1,416 years)(AECOM, 2013). If any release did occur, it is likely that the total release volume of a spill likely would be three barrels or less based on historical spill volumes (AECOM, 2013). In the unlikely event of a leak, wetlands or riparian areas would be inundated with crude oil or produced water eliminating ecosystem functions if a wetland or riparian area. The probability of these adverse effects is unlikely, since there would be a low probability of a spill, and a spill would have to occur in a wetland. The PRAECA report (AECOM, 2013) provides additional information regarding potential impacts to wetlands and an analysis of the likelihood and potential magnitude from a potential spill event.

4.6.2 Mitigation – Wetlands and Riparian Zones

To minimize environmental impacts from the proposed Project on wetlands and riparian zones, CEBCS would implement the environmental protection measures described below. Minimization measures include the exclusion of permanent facilities within wetlands, and the implementation of BMPs (e.g., installation of erosion control devices to reduce sediment transport into wetlands). The Construction, Reclamation, and Monitoring Plan (POD Appendix D) outlines the procedures to be followed during construction and reclamation, and the subsequent mitigation necessary to return all wetland and waterbodies to pre-disturbance conditions. CEBCS would coordinate with the COE and other regulatory agencies as appropriate to identify restoration and mitigation measures; and develop appropriate revegetation seed mixtures if needed.

HDD implementation would avoid all direct surface disturbance to 37 wetlands in the project area, but temporary surface disturbances, in the form of clearing of a 15-foot-wide travel lane, would occur at 11 of the planned 37 HDD crossings of riparian and wetland habitats. Such travel lanes would only be utilized where no reasonable alternative means of ingress or egress exists to access remote portions of the project construction ROW. Additionally, BMPs would be implemented where appropriate when accessing those locations (e.g., cutting vegetation at ground level, removing only those stumps necessary for safe travel, use of timber mats to prevent rutting and compaction, etc.).

In areas where a HDD cannot be used, CEBCS would minimize construction width in riparian areas to reduce the extent of disturbance. For example, when crossing a wetland or riparian community, the nominal construction ROW would be reduced from 125 feet to 75 feet through and within a 50-foot buffer of the resource where possible. Where clearing of riparian areas cannot be avoided, at the direction of the applicable land management agency or land owner CEBCS would spread wheatgrass to provide temporary cover while allowing native herbaceous and woody vegetation to become re-established without excessive competition.

In areas where avoiding direct disturbance of wetland or riparian features would not be possible, CEBCS would notify the COE of any potentially jurisdictional areas and/or any wetland or riparian areas that would be affected by the proposed Project. Copies of all correspondence with the COE would be submitted to BLM, North Dakota Field Office as well as the USFS. CEBCS would comply with all applicable COE conditions for Nationwide Permit authorization issued for the Project.

The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system, during operation, the pipelines would be monitored 24 hours a day, 365 days a year using a sophisticated SCADA system. This system would provide real time data used to detect leaks and allow CEBCS to initiate a system shutdown if a leak is detected. In addition, direct observation of the ROW would occur of the ROW once every two weeks. These monitoring efforts would include aerial surveys, ground surveys, and a public and landowner awareness program for leak detections. The PRAECA report (AECOM, 2013) provides additional information regarding mitigation measures for leak detection during operation.

4.7 Vegetation

4.7.1 Direct and Indirect Effects

Construction

The construction ROW where a single pipeline is proposed would be 50, 100, and 100 feet on federal, NDTL and private lands, respectively; whereas, the permanent easement would be smaller in width at 20, 33, and 50 feet, respectively. Where two pipelines are proposed, the construction ROW would be 80, 125, and 125 feet on federal, NDTL and private lands, respectively compared to a permanent easement width of 50, 33, and 50 feet, respectively. ATWS along, but outside the nominal ROWs would be needed to facilitate equipment turnarounds, parking areas, pipe and pipe fitting storage, and steep slope construction, as well as for segregating topsoil and assuring the safe handling of materials and operation of equipment. The locations and acres of the ATWS outside of the typical construction ROW required for the Project are provided in Table 2.1.1-2.

Direct effects from construction of the Project would include the removal of vegetation within the construction ROW as a result of topsoil stripping and segregation. Indirect effects could include the spread of noxious weeds and non-native invasive plant species. Table 4.7.1-1 below summarizes the acreage of each vegetation cover type disturbed by proposed Project activities. Construction within the pipeline ROW and use of ATWS would temporarily affect about 910.3 acres of land, of which about 454 acres would be retained as permanent easement but will be allowed to revegetate. Other than the storage/transfer facility and developed aboveground facility sites (40.5 acres), the entire linear ROW would be returned to prior use following construction.

TABLE 4.7.1-1

Bear Den Project
Vegetation Types and Acres Impacted

Vegetation Type	General Vegetation Description	Acres Impacted
Cultivated Cropland	Lands tilled and planted to annual herbaceous small grain and row crops	131.2
Developed, Open Space	Open space is mostly landscaped vegetation, Areas are most commonly large lots with single family homes and recreation settings.	3.4
Disturbed, Non-specific	Barren or low vegetation due to human alteration or management. Tend to be associated with heavy grazing	3.8
Inter-Mountain Basins Big Sagebrush Steppe	Patchy distribution of shrubs among grassland habitat.	0.1
Inter-Mountain Basins Greasewood Flat	Moderate shrublands mixed with salt desert scrub. Typically occur on stream terraces where the water table is high enough to support vegetation.	0.1
Introduced Upland Vegetation – Perennial Grassland and Forbland	Significantly altered landscape with no natural vegetation. All non-native perennials and forbs.	1.9
Northwestern Great Plains Mixedgrass Prairie	Typically dominated by cool season grasses with scattered forbs and shrubs, including green needlegrass, needle and thread grass, Western wheatgrass, blue grama prairie sagewort, and prairie coneflower.	613.2
Northwestern Great Plains Shrubland	Occurs near slopes or on upper terraces of rivers and streams and has fine to sandy loam soils and has a shrub den	11.3
Open Water (Fresh)	Areas of open water with less than 25% vegetative cover	0.7
Pasture/Hay	Vegetation cover mainly comprised of introduced or enhanced native forage species used for livestock grazing.	4.4
Southwestern Great Plains Canyon	A complex mosaic of grasslands, shrublands, and woodlands within the canyon system.	2.9
Western Great Plains Badland	Rugged, eroded lands that lie well above or below local base level and are relatively free of vegetative cover.	6.3
Western Great Plains Depressional Wetland Systems	Occur in lowland depressions with a permanent water source through most of the year and have high species diversity.	20.7
Western Great Plains Dry Bur Oak Forest and Woodland	This ecosystem includes the bur oak-dominated upland woods of bluffs and ravines, primarily in the mixed-grass prairie environment	3.7
Western Great Plains Floodplain Systems	Alluvial soils with periodic flooding dominated by floodplain forests, wet meadows, and gravel flats with grass cover under trees.	47
Western Great Plains Sand Prairie	Contain elements of tallgrass and shortgrass prairies that are very susceptible to wind erosion because of the soil composition and vegetative cover.	7.5
Western Great Plains Wooded Draw and Ravine	Occur on steep northern slopes or canyon bottoms with higher moisture levels than what is common for the area. Green ash, elm, and boxelder maples are common.	51.8
Total		**910.3**

Prior to construction of the proposed pipeline facilities, CEBCS would clear vegetation from the construction ROWs and ATWS. CEBCS would perform topsoil segregation in actively cultivated agricultural lands, which include permanent or rotated croplands, hayfields, or improved pastures, and in other areas at the request of resource agencies or landowners. All suitable topsoil would be removed from the full ROW and would be stored in a separate pile from sub-soil until reclamation occurs. Topsoil stripping and segregation from trench spoil would protect and retain the inherit fertility of the surface layer.

Construction of the proposed Project would result in short- to long-term and limited permanent impacts to vegetation. Short-term effects are associated with the length of time to return the construction ROW and other temporary work areas to pre-construction conditions. The primary impact of construction of the Project on vegetation would be the short- to long-term alteration of cover on managed pasture/hay land and prairie grassland.

Operations and Maintenance

The primary impact of operation of the Project on vegetation would occur where the Project would convert vegetated land to permanent aboveground facilities (40.5 acres). In order to maintain accessibility of the rights-of-way, to accommodate pipeline integrity surveys, and to maintain visibility of pipeline markers, vegetation along the permanent pipeline easement will be periodically maintained. The goal of such vegetation maintenance activities will be to establish and retain a low-growing, herbaceous vegetative ground cover. As conditions require, it will be necessary to periodically remove woody vegetation (shrubs and trees) from the permanent pipeline easement on federal, NDTL, and private lands. However, no maintenance clearing of woody vegetation will generally be required in wetland and riparian areas within the permanent pipeline easement corresponding to segments of pipeline installed via HDD. Given the prevailing short-grass vegetative cover in the project area, regular maintenance mowing of the permanent pipeline easement is not anticipated. In the unlikely event that maintenance mowing is identified as required, CEBCS would coordinate with BLM and the USFS prior to conducting any such activities on federal lands traversed by the Project pipeline.

4.7.2 Mitigation – Vegetation

During Project development, CEBCS took measures to avoid sensitive habitats like wetlands, forested riparian areas, and grasslands. In many areas, HDDs were employed to avoid sensitive habitats such as steep slopes, wetlands, and riparian areas.

The construction ROW would be reclaimed to preconstruction conditions. Disturbed areas would be restored to approximate the original contour of the land as closely as possible. Topsoil would be segregated and would not be mixed with spoil material before or during replacement. Only topsoil would be re-spread over the surface of disturbed areas to provide plant-essential nutrients that are generally found at or near the surface. In upland soils, CEBCS would disk or harrow the disturbed construction ROW to roughen the surface to enhance water and root penetration. All areas disturbed by construction activities on NDTL and private lands crossed by the Project would be reclaimed using native vegetation including western wheatgrass (*Agropyron smithii*), green needlegrass (*Stipa* viridula), and prairie sandreed (*Calamovilfa longifolia*), or in accordance with landowner request. All areas disturbed by construction activities on federal land crossed by the project will receive a seed mix with up to nine different species including cool and warm season grasses and forb species including: western wheatgrass, green needlegrass, Canada wildrye (*Elymus Canadensis*), blue grama (*Bouteloua gracilis*), prairie sandreed, little bluestem (*Schizachyrium scoparium*), purple prairieclover (*Dalea purpurea*), stiff sunflower (*Helianthus pauciflorus*), and purple coneflower (*Echinacea angustifolia*). Seed mixes were developed in cooperation with the USFS, BLM, and private landowners and were developed for the land types within the Project area. Seed that is certified or registered by the state of North Dakota (or the state of origin) would be used. Seed certification tags would be submitted to the BLM Authorized Officer (AO) and USFS McKenzie Ranger District prior to seeding efforts. If moisture conditions are favorable, permanent seeding would be done in the early fall (September) before the ground freezes. If moisture conditions in September are not favorable for seed germination, permanent seeding would be completed in October and November as recommended by the BLM. Seeding will not occur if snow or frozen soils are present. If needed, revegetation may occur during the following spring, depending on weather or construction scheduling. CEBCS would revegetate disturbed areas consistent with its CRMP (POD Appendix E), other permit requirements, and site-specific landowner requests.

The success of revegetation would depend on the local climate and soil moisture conditions at the time of planting, subsequent rainfall, soil type, seed, and seeding method. While CEBCS' reclamation efforts would reestablish vegetation along the ROW, the amount of time required for complete recovery of the ROW to preconstruction conditions would vary depending on the species, with some areas restored to pre-construction conditions in 1 to 3 years (i.e., wetlands), while others, such as native prairie, possibly taking 10 years or more for full recovery.

If the supply of a specific seed is limited or unavailable at the time of revegetation, CEBCS would consider alternative species subject to land management agency approval. To assess the effectiveness

of the reclamation treatments and to evaluate the condition of the ROW, CEBCS would implement a monitoring program consisting of field inspections and vegetative analysis. A report of the condition of the ROW and the status of sensitive resources affected during construction would be submitted to the BLM. The monitoring program would also identify remedial measures that would be considered by CEBCS to mitigate environmental degradation if the initial treatments were not effective in achieving the objectives of the reclamation program. On federal lands, vegetation monitoring would occur on an annual basis for the first five years or until revegetation is successful. Successful reclamation performance would be based on revegetation success, the absence of noxious weeds, stability of the construction ROW, waterbody bed and bank stability, and visual aesthetics. CEBCS would consider long-term revegetation to be successful if approximately 70 percent of the background cover is reestablished in disturbed areas. Specific reclamation success criteria would be established in coordination with the BLM, USFS, and other applicable land management agencies. Additional reclamation monitoring criteria and techniques can be found in CEBCS CRMP (POD Appendix E).

Construction activities could potentially result in the spread of noxious weeds, further described in Section 4.8. Construction equipment carrying soil with weed seeds and propagules could introduce noxious weeds to the Project area. To mitigate the spread of any noxious weeds, CEBCS would implement BMPs and weed control practices discussed in its Weed Management Plan (POD Appendix K).

4.8 Noxious Weeds and Invasive Species

4.8.1 Direct and Indirect Effects

Construction

Table 3.8.1-1 lists the invasive and noxious weeds occurring along the proposed ROW during surveys conducted in August and September 2012 by WEST. A total of 200 acres of the project area have current weed infestations or populations, of which approximately 107 acres would be retained as new permanent ROW.

As part of the proposed Project, the improvement and increased use of existing roads during construction could promote the expansion and recruitment of noxious weed and invasive plant species to otherwise remote areas.

Operations and Maintenance

After pipeline construction has been completed, CEBCS would be responsible for monitoring, maintaining, and inspecting the operation of the pipeline system which would allow for early detection of noxious and invasive weed species infestations. Weed controls would be used in accordance with existing regulations and landowner or agency agreements, including USFS's Dakota Prairie Grasslands Noxious Weed Management Project. As stated in CEBCS' Weed Management Plan (POD Appendix K), post-construction control measures along the ROW may include mechanical means, such as disking, or herbicide application in cultivated or bare ground areas. In native areas, disking would not be performed and any herbicide application on federal lands would be consistent with the USFS' stipulations for herbicide use as found in the Dakota Prairie Grasslands Noxious Weed Management Project.

4.8.2 Mitigation – Noxious Weeds and Invasive Species

To limit the success of invasive species, the construction ROW would be re-contoured, stabilized, and revegetated after pipeline construction. In the construction ROW topsoil would be segregated and would not be mixed with spoil material before or during replacement. Once the disturbed areas have been de-compacted as needed, topsoil would be re-distributed over the entire disturbed area from which it was salvaged and re-contoured (see CEBCS' CRMP for details; POD Appendix E). Final revegetation would occur within the approved seeding window as outlined in the CRMP (POD Appendix E). Successful revegetation would help minimize the spread of noxious weeds. Contractor vehicles and equipment would arrive to the Project area clean and weed-free as verified by the EI on each construction spread at

a pre-approved inspection station site. Prior to leaving a work site infested with noxious weeds along the Project ROW, vehicles and equipment would first be cleaned with an air compressor to limit the spread of noxious weeds during construction. Straw bales or mulch, used on the Project for sediment barrier installations, will be certified weed-free. CEBCS developed a Weed Management Plan (POD Appendix K) which identifies the specific location of weed populations and measures that would be implemented to manage noxious and invasive weeds during and after construction, based on recommendations from the BLM, USFS, NRCS, and local weed control authorities. Limiting the source and amounts of nonnative invasive species may reduce recruitment of these plants into potential breeding or foraging habitat for special status species and other wildlife and aquatic resources.

CEBCS plans to implement both mechanical and chemical treatment methods to prevent the spread of weeds along the Project rights-of-way and ancillary facilities. All weed controls would be used in accordance with existing regulations and landowner or agency agreements, including USFS's Dakota Prairie Grasslands Noxious Weed Management Project. During and after construction, CEBCS proposes to periodically monitor the Project ROW during pipeline operations to allow for early detection of noxious and invasive weed species infestations. If such species are found in numbers that are significantly different from existing nearby off ROW locations, appropriate control measures would be implemented in an attempt to control the identified weed infestations along the ROW and to reduce the spread or proliferation of weeds, recognizing that eradication would be difficult if not impossible to achieve given that CEBCS could only implement such measures with the Project ROW where it has access and operational responsibility.

4.9 Special Status Animal Species

4.9.1 Direct and Indirect Effects

The impact analysis area for special status species is defined by the Project area and relevant areas associated with the life histories of these species. The Project area includes the construction ROWs, pipe storage and contractor yards, aboveground facilities, access roads, and ATWS.

The Project would result in both direct and indirect impacts to special status species. Direct impacts to special status wildlife could include mortalities or displacement related to pipeline construction and operation. Indirect impacts to special status wildlife could include short-term displacement of mobile species (e.g., larger mammals, adult birds) in response to temporary habitat loss, increased noise levels, and human activity along the ROW and permanent easement. Impact levels depend upon timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

Construction

Federally Listed Species

No direct impacts to least terns, piping plovers, and whooping cranes are anticipated during construction.

Direct impacts to suitable whooping crane stopover habitat due to construction of the pipeline through wetlands, waterbodies, and croplands would be temporary until the impacted areas are reclaimed or are allowed to naturally revegetate (i.e., wetlands or waterbodies crossed by open-cut methods).

Pallid sturgeon could potentially be impacted by contamination related to inadvertent spills (if they enter surface waters) of hazardous materials used for construction. Least terns, piping plovers, and whooping cranes could potentially be indirectly impacted by contamination related to inadvertent spills of hazardous materials used for construction if they were to occur within potential feeding or breeding habitat.

If water withdrawals were to occur from surface waters within the Little Missouri River potential impacts could result in mortality of pallid sturgeon or impacts to potential spawning and nursery habitats downstream in Lake Sakakawea. Indirect impacts could occur to potential breeding and feeding habitat of least tern and piping plovers due to surface disturbance associated with water withdrawals and the

potential for increased sedimentation and turbidity to adjacent waters. Fish and insects, prey items for piping plovers, least terns, and whooping cranes, could also become entrained on equipment used to withdraw water from surface waters. However, water for hydrostatic testing would be obtained from a municipal or commercial water source and will not come from surface waters within the Project area, thus avoiding these potential impacts.

Surface disturbing activities near waterbodies could contribute increased sedimentation and turbidity to adjacent waters. This could directly impact potential pallid sturgeon habitat. Increased amounts of fine sediments deposited on streambeds is a major cause of changes in species structure and abundance and may even lead to local extinctions of invertebrates and fish species (USGS, 2012). Indirect impacts due to increased sedimentation to streams and wetlands could potentially indirectly impact prey items, fish and insects, of least terns, piping plovers, and whooping cranes.

Potential indirect impacts to least terns, piping plovers and whooping cranes could result from increased noise and human presence during construction. These indirect impacts could result in individuals avoiding stopover habitat (whooping crane), nest abandonment (least terns and piping plovers) or avoidance of potential feeding areas.

Indirect impacts to least tern, piping plover, and whooping crane potential habitat could result from the expansion and recruitment of noxious or non-native invasive plant species due to the creation of the ROW. Additional potential indirect impacts due to the temporary increased use of unpaved roads which may increase particulate matter into the air could affect whooping cranes, piping plovers, and least terns if they are present.

<u>USFS/BLM Sensitive Species</u>

Birds

The burrowing owl may potentially be disturbed by human presence and construction activities that occur within sight and sound of their nesting, feeding, and/or roosting areas. If present, active burrowing owl burrows and alternate burrows may be destroyed by construction activities including clearing of the ROW, trenchline digging, and burying of the pipeline system.

Potential direct impacts to Baird's sparrows, Sprague's pipits, loggerhead shrikes, and long-billed curlews during construction could result in direct mortalities of individuals and nests due to the use of heavy construction equipment. Potential indirect impacts to these avian species could result from contamination related to spills of hazardous products within breeding or feeding habitats. Potential indirect impacts to these avian species could result from increased noise and human presence during construction which could lead to nest abandonment, and avoidance of potential breeding and/or feeding areas. Potential indirect effects to these species would result in the incremental reduction of potentially suitable habitat, alteration and fragmentation of habitat area during construction of the permanent easement. The removal of woody vegetation along the ROW for construction may reduce the number of hunting perch and prey impalement locations for loggerhead shrikes. Some species could benefit from the reduction of woody vegetation and the control of invasive noxious species along the ROW if those activities occur outside of the breeding season.

Additional indirect impacts due to the temporary increased use of unpaved roads which may increase particulate matter into the air that could potentially affect those birds listed as USFS/BLM Sensitive Species.

Mammals

Black-tailed prairie dogs are year round residents and four small colonies, between 6.06 acres and 27.54 acres in size, occur within the Project area on private land. The Project may result in direct mortalities of individuals as a result of crushing from construction activities, vehicles, and equipment. There would be

direct impacts to their habitat and potentially to their burrow systems on private land. There would be 5.81 acres of temporary impacts within the construction ROW and 4.16 acres of impacts within the permanent easement within the four black-tailed prairie dog colonies on private land. Therefore, the Project would impact a total of 9.97 acres of prairie dog colonies on private land. Prairie dogs would be allowed to recolonize the Project ROW following Project completion. The ground disturbance activities may provide areas that are readily used by black-tailed prairie dogs to reconstruct their burrow systems. Reclamation of the ROW would encourage native plants to recolonize the area and may potentially provide a food source for the prairie dog colonies along the Project on private land. Additional impacts may result from human presence and noise during construction and increased habitat fragmentation due to creation of the ROW.

Potential direct impacts to bighorn sheep from construction activity include mortality to individuals due to roads and construction equipment through bighorn sheep habitat. Disturbance associated with construction would be short-term, and it is assumed that animals would return to the area following the completion of Project construction. Potential direct impacts to bighorn sheep include the short-term loss of potential forage areas and an increase in habitat fragmentation. Big game species tend to move away from areas of human activity and roads, therefore, reducing habitat utilization near disturbance areas (Cole et al., 1997; Sawyer et al., 2006; Sayre, 1996). The loss of foraging habitat would be temporary in nature and in most instances suitable foraging habitat would be available for bighorn sheep adjacent to disturbed areas. Potential indirect impacts to bighorn sheep would result from increases in noise levels and human presence during construction. Bighorn sheep exhibit increased levels of stress caused by human activities near them and such stressors can lead to negative physiological and physical effects (Dyke et al., 2011). If Project construction activities occur between April 1 and June 15, the disturbance may result in the avoidance of lambing habitat therefore lambs may become more susceptible to various mortality factors (Dyke et al., 2011). Lambing areas are the most critical habitats use by bighorn sheep and, because such areas are very limited in North Dakota, are the most significantly impacted by human-caused disturbances (Dyke et al., 2011).

Fish

Potential impacts to redbelly dace during pipeline construction are dependent on the resources, construction methods, time of the crossing, duration of in-stream construction activities, water volume and velocity of flow, and mitigation measures employed during construction. If in-stream project related activities were to occur in perennial waterbodies, the redbelly dace could potentially experience a temporary loss of habitat. Potential impacts resulting from open-cut crossing methods include disturbance of the streambed, resulting in impacts to subsurface macroinvertebrates and potential interference with hyporheic flows (mixing of shallow groundwater and surface water). Construction would result in potential reduction of habitat, alteration of habitat structure, alteration of substrate and bank structure, and changes in benthic invertebrate communities.

Surface disturbing activities near waterbodies could contribute increased sedimentation and turbidity to adjacent waterbodies. This may occur when open-cut methods are used to cross perennial or intermittent streams, when stripping vegetation from the ROW, or when accessing specific HDD sites by crossing a waterbody. The redbelly dace is a sight-feeding predator that depends on relatively clear water therefore increased sedimentation and turbidity could adversely impact the species. Increased amounts of fine sediments deposited on streambeds is a major cause of changes in species structure and abundance and may even lead to local extinctions of invertebrates and fish species (USGS, 2012).

Hydrostatic testing activities are not anticipated to withdraw water from surface water sources and therefore no depletions are expected from construction activities. However, if any water withdrawals were to occur for the Project, fish could also become entrained on equipment used to withdraw water from surface waters. If hazardous chemicals associated with noxious weed control enter streams along the Project, water quality could be reduced in potential redbelly dace habitat or they could potentially contaminate their food supply.

Invertebrates – Butterflies

The Project could potentially impact individuals or habitat of USFS/BLM sensitive butterfly species during construction of the Bear Den Project. Potential impacts to Dakota skippers, ottoe skippers, regal fritillaries, and tawny crescents because of construction activity and the use of heavy equipment, include temporary loss of habitat and mortality to adults along the Project area. The temporary loss of vegetation along the construction ROW could reduce adult nectar sources, larval food sources, and potential nest structures for larvae. The Project could result in the fragmentation and degradation of potential sensitive butterfly habitat by the creation of a ROW followed by a slow restoration process for reclaimed prairie habitats that can take a decade or more to recover (FWS, 2012). In addition, mortality to larvae could occur when clearing and grading the construction ROW and when digging a trenchline.

Operations

Federally Listed Species

The maintenance of woody vegetation within wetlands along the permanent easement may temporarily disturb whooping cranes if present; however, pruning woody vegetation within the ROW through wetlands may improve the habitat by reducing visual obstructions.

Pallid sturgeon could potentially be directly impacted by contamination related to inadvertent spills of crude oil and produced water flowing in the pipelines. Whooping cranes, piping plover, and least terns could also potentially be indirectly impacted by contamination related to inadvertent spills of crude oil and produced water flowing in the pipelines. To establish the potential for a spill, baseline resultant incident frequencies were calculated from historical national pipeline incident data associated with earlier (i.e., the 1970s or earlier) pipeline design and construction methods that often do not meet the current best management standards. Consequently, the spill frequency is considered extremely conservative and over-estimates the probability of a spill. The resultant incident frequency for a pipeline leak is 8.83E-04 (or 0.000883) incidents/mile-year, equivalent to one incident in 1,100 years per mile of pipe (AECOM, 2013). Based on the spill frequency and a total of 129 miles of pipeline, which conservatively considers both the crude oil pipeline and associated produced water pipeline mileage, this analysis estimates that there could be 1.1 spills during a 10-year period (AECOM, 2013). If any release did occur, it is likely that the total release volume of a spill would be three barrels or less based on historical spill volumes (AECOM, 2013). In the unlikely event of a leak, any direct contact with crude oil by pallid sturgeon and their larvae and ingestion of crude oil from contaminated prey and water could result in adverse effects including mortality. In the unlikely event of a leak, any direct contact with crude oil by whooping cranes, least terns, or piping plovers could result in adverse effects due to oiling of plumage, ingestion of crude oil from contaminated plumage or prey, and transfer of crude oil to eggs and young. The probability of these adverse effects impacting these federally listed species is unlikely, since there would be a low probability of a spill, and a spill would have to coincide with the presence of a whooping crane, piping plover, or least tern in the Project area. Crude oil would have to travel over a significant distance in large volumes and remain undetected in order to reach the waters of Lake Sakakawea, where pallid sturgeon and piping plovers are known to occur.

USFS/BLM Sensitive Species

Birds

If present, the burrowing owl could potentially be disturbed by human presence and increased noise during maintenance activities that occur within sight and sound of their nesting, feeding, and/or roosting areas. Active burrowing owl burrows and alternate burrows could potentially be driven over during maintenance operations and inspections.

If present, potential direct impacts to Baird's sparrows, Sprague's pipits, loggerhead shrikes, and long-billed curlews during maintenance of woody vegetation along the permanent easement could result in

direct mortalities of individuals and nests. Potential indirect effects to these species would result in the incremental reduction of potentially suitable habitat, and alteration and fragmentation of habitat area during continued maintenance of the permanent easement. The removal of woody vegetation along the permanent easement to maintain pipeline integrity may reduce the number of hunting perch and prey impalement locations for loggerhead shrikes. The control of noxious plants along the permanent easement and construction ROW could potentially indirectly impact the prey items (insects) of these sensitive avian species if control occurs within the breeding season. Additional potential indirect impacts to these avian species could result from increased noise and human presence during maintenance which could lead to nest abandonment, and avoidance of potential breeding and/or feeding areas.

Mammals

The Project may result in potential direct mortalities of black-tailed prairie dogs as a result of crushing from maintenance vehicles. Inspections would be primarily performed from aircraft therefore direct impacts to individuals or active colonies/habitat along the permanent easement would be minimal. Additional impacts could potentially result from human presence and noise during maintenance.

Potential direct impacts to bighorn sheep from maintenance activities could include mortality to individuals by the operation of vehicles along the permanent easement within bighorn sheep habitat. Potential indirect impacts to bighorn sheep would result from increases in noise levels, increased human presence, and aerial surveys during pipeline maintenance and operation procedures. Bighorn sheep exhibit increased levels of stress caused by human activities near them and such stressors can lead to negative physiological and physical effects (Dyke et al., 2011). If Project maintenance activities occur between April 1 and June 15, the disturbance could potentially result in the sheep avoiding lambing habitat therefore lambs may become more susceptible to various mortality factors (Dyke et al., 2011). Lambing areas are the most critical habitats used by bighorn sheep and, because such areas are very limited in North Dakota, are the most significantly impacted by human-caused disturbances (Dyke et al., 2011).

Fish

Maintenance activities would not occur within the Little Missouri River therefore no impacts related to maintenance of the pipelines are expected. Redbelly dace could potentially be directly impacted by contamination related to inadvertent spills of crude oil and produced water that would be carried within the pipelines. To establish the potential for a spill, baseline resultant incident frequencies were calculated from historical national pipeline incident data associated with earlier (i.e., the 1970s or earlier) pipeline design and construction methods that often do not meet the current best management standards. Consequently, the spill frequency is considered extremely conservative and over-estimates the probability of a spill. The resultant incident frequency for a pipeline leak is 8.83E-04 (or 0.000883) incidents/mile-year, equivalent to one incident in 1,100 years per mile of pipe (AECOM, 2013). Based on the spill frequency and a total of 129 miles of pipeline, which conservatively considers both the crude oil pipeline and associated produced water pipeline mileage, this analysis estimates that there could be 1.1 spills during a 10-year period (AECOM, 2013). If any release did occur, it is likely that the total release volume of a spill likely would be three barrels or less based on historical spill volumes (AECOM, 2013). In the unlikely event of a leak, any direct contact with crude oil by redbelly dace and their larvae and ingestion of crude oil from contaminated prey and water could result in adverse effects including mortality. The probability of these adverse effects impacting this species is unlikely, since there would be a low probability of a spill, and a spill would have to coincide with the presence of redbelly dace.

Invertebrates – Butterflies

The Project could impact individuals or habitat of USFS/BLM sensitive butterfly species during operation of the Bear Den Project. Potential impacts to Dakota skippers, ottoe skippers, regal fritillaries, and tawny crescents by the maintenance of woody vegetation along the permanent easement could include mortality to adults or larvae by operations vehicles. The use of herbicides to control noxious weeds could potentially indirectly impact USFS/BLM sensitive butterfly species.

4.9.2 Mitigation – Special Status Animal Species

Mitigation measures that apply to most if not all the federally listed species and USFS Sensitive Species that may occur in the Project area include the following:

- CEBCS would reduce the Project construction ROW and permanent easement widths where possible. Construction ROW widths where a single pipeline is proposed would be 50, 100, and 100 feet on federal, NDTL and private lands, respectively, whereas the permanent easement would be smaller in width at 20, 33, and 50 feet, respectively. Where two pipelines are proposed, the construction ROW would be 80, 125, and 125 feet on federal, NDTL and private lands, respectively compared to a permanent easement width of 50, 33, and 50 feet, respectively;
- CEBCS would avoid sensitive habitats (i.e. wetlands, waterbodies, native prairie) during project planning to the extent practicable;
- CEBCS would collocate 58 percent of the Project with other ROWs (i.e., electric transmission, railroad, road) to decrease the amount of new ground disturbing activity and fragmentation in the region;
- trenchless HDD methods with an operational Horizontal Directional Drill and Contingency Plan would be used when crossing the Little Missouri River (twice), as well as at 38 other waterbody and 45 wetland crossings;
- temporary construction bridges would be installed across waterbodies in all construction areas (if crossed for HDD or open-cut construction) prior to ROW grading and would be removed once construction and restoration has been completed;
- little or no grading would occur in wetlands and there would be no use of mulch, lime or fertilizers in wetlands;
- to avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation (if soils are not saturated), and excavation would be limited to the area immediately over the trenchline;
- efforts would be taken to salvage and segregate topsoil in native prairie (and other habitat types along the Project) to maintain the native seed sources for reclamation of impacted areas;
- there would be no depletion of water from the Little Missouri River and its tributaries to conduct hydrostatic testing of the pipeline, water would be obtained from municipal or commercial water sources;
- prior to moving equipment onto the construction ROW, CEBCS' contractor would visually inspect equipment for cracks, excessive corrosion, or other flaws that may compromise the integrity of fuel, hydraulic, or cooling systems;
- by implementing the SPCC Plan, the project's short- and long-term impact on groundwater and surface water resources would be greatly reduced or limited;
- various permanent and temporary resource protection measures would be used to protect the integrity of the ROW and prevent sediment deposition into sensitive wetland and waterbody resources;
- contractor vehicles and equipment would arrive to the Project clean and weed-free;

- air compressors would be used to remove seeds and vegetation of noxious weeds at approved cleaning stations where vehicles leave an infested area along the Project;
- if straw sediment barriers are used they would be certified weed-free to prevent the further spread of invasive non-native vegetation;
- seed that is certified or registered by the state of North Dakota (or the state of origin) would be used. Seed certification tags would be submitted to the BLM Authorized Officer (AO) and USFS McKenzie Ranger District prior to seeding efforts;
- the Weed Management Plan identifies specific weed populations and control measures during and after construction that would be implemented to manage noxious plant species;
- construction vehicles would be properly muffled to minimize noise;
- fugitive dust from both access roads and the construction ROW itself shall be controlled as outlined in the CRMP (POD Appendix E);
- the location of the pipeline would be marked to prevent third party excavation damage;
- where the Project crosses ecologically sensitive HCAs, areas mostly associated with river systems (AECOM, 2013), CEBCS is required to increase their level of pipeline inspection, as per 49 CFR Part 195, in order to reduce the chance of pipeline incident;
- emergency shut-off block valves are proposed on either side of the Little Missouri River and are placed along the project ROW to meet federal regulations (49 CFR 195) to help reduce the amount of crude oil or produced water that could potentially spill into sensitive areas along the Project;
- a remote leak detection and monitoring system would be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be identified and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance;
- CEBCS would follow a written manual of procedures for conducting normal maintenance activities and for handling abnormal operations and emergencies; and
- at the end of the useful life of the pipeline system, CEBCS would obtain the necessary authorizations from the BLM AO and other applicable local, state, and federal agencies to implement an acceptable facility abandonment plan.

Additional mitigation measures are summarized below.

Birds

An EI would be trained on the proper identification and habitat requirements of whooping cranes, least terns, and piping plovers. An MBTA Coordinator and their assistants would implement the mitigation and compliance requirements outlined in the Migratory Bird Impact Assessment, Mitigation, and Compliance Plan. If whooping cranes are observed within 1 mile, and if least terns or piping plovers are observed within a half of mile of the Project area, the FWS would be immediately contacted and construction activities within 1-mile or a half mile radius of the sighting would be curtailed until the individuals have left the area. Additional protection measures for whooping cranes, least terns, or piping plovers could be determined in consultation with the FWS. The MBTA Coordinator would also be responsible for pre-construction surveys from May through June to look for active nests of migratory bird species within the Project area. If the BLM/USFS sensitive bird species are nesting along the Project, they would receive a

30-foot buffer from construction activities, with signage if required, and would be monitored weekly during construction until the young have fledged. Construction activities within 0.25 miles of an active burrowing owl nest from April 15 until August 31 would be avoided. In accordance with recommendations received from the FWS, two aerial surveys for raptor nests were conducted within 1-mile of the construction right-of-way in April and May 2013 to determine if there are active raptor nests in the Project area. A total of three active golden eagle nests were located within 1.0 mile of the proposed construction corridor (WEST, 2013). No activity will occur within a 0.5 mile buffer of the active golden eagle nests until the young have fledged or the nest has failed.

Mammals

CEBCS would avoid Project construction and pipeline maintenance during the lambing season along approximately 11 miles of the construction ROW where it crosses sensitive lambing habitat on BLM, NDTL, and private land. Table 4.9.2-1 shows where Project construction as well as maintenance activities (i.e. control of woody vegetation) would be avoided during the sensitive lambing period from April 1 through June 15. The project areas identified in Table 4.9.2-1 were identified by BLM staff during a pre-construction meeting held in Dickinson, North Dakota on February 13, 2012.

TABLE 4.9.2-1

Bear Den Project
Locations of Construction and Maintenance Time of Year Restrictions (April 1 to June 15) to Protect Bighorn Sheep Lambing Areas along the Project

Segment	Milepost	Landowner
AR-13	Entire segment	Private
AR-17	Entire segment	Private
AR-20	Entire segment	BLM, Private
AR-21	0 – 0.3	Private
AR-26	Entire segment	NDTL, Private
AR-29	1.4 – 2.2	BLM, Private
AR-30	4.4 – 10.9	BLM, NDTL, Private

Invertebrates – Butterflies

Approximately 108.8 acres of native grasslands would be impacted on Federal lands potentially impacting Dakota skippers, ottoe skippers, regal fritillaries, and tawny crescents. Following construction, approximately 68.0 acres of grasslands would remain within the permanent pipeline easement to be retained during operation of the facilities on Federal land. These habitats would be restored as near as practicable to pre-construction condition using plant species recommended by the USFS (CRMP; POD Appendix E). The remaining 40.8 acres would be restored in the same manner, but would not be part of the permanent easement. Accordingly, CEBCS would provide funds for the purchase of approximately 109 acres of grassland conservation easements to compensate for the potential loss of habitat for USFS sensitive butterflies on Federal land.

4.9.3 Effects Determination Summary

Table 4.9.3-1 summarizes the effects determinations for the Project under Section 7 of the ESA and the February 2011 Regional Forester's Sensitive Species List for Region 1 analyzed above.

TABLE 4.9.3-1

Bear Den Project
Special-Status Animal Species with the Potential to Occur within the Project Area

Common Name	Scientific Name	Listed Status [a]	Effect Determination
Birds			
Bald eagle	*Haliaeetus leucocephalus*	FS, BGEPA	NI
Baird's sparrow	*Ammodramus bairdii*	FS	MI
Burrowing owl	*Athene cunicularia*	FS	NI
Greater sage-grouse	*Centrocercus urophasianus*	FC, FS	NI
Greater prairie-chicken	*Tympanuchus cupido*	FS	NI
Interior least tern	*Sterna antillarum athalassos*	FE	NLAA
Loggerhead shr ke	*Lanius ludovicianus*	FS	MI
Long-billed curlew	*Numerus americanus*	FS	MI
Piping plover	*Charadrius melodus*	FT	NLAA
Sprague's pipit	*Anthus spragueii*	FC, FS	NLJ
Whooping crane	*Grus Americana*	FE	NLAA
Mammals			
Gray wolf	*Canis lupis*	FE	NE
Black-tailed prairie dog	*Cynomys ludovicianus*	FS	NI
Rocky Mountain bighorn sheep	*Ovis Canadensis*	FS	MI
Black-footed ferret	*Mustela nigripes*	FE	NE
Fish			
Pallid sturgeon	*Scaphirhynchus albus*	FE	NLAA
Northern redbelly dace	*Phoxinus eos*	FS	MI
Invertebrates			
Arogos skipper	*Atrytone arogos iowa*	FS	NI
Broad-winged skipper	*Poanes viator*	FS	NI
Dakota skipper	*Hesperia dacotae*	FC, FS	NLJ
Dion skipper	*Euphyes dion*	FS	NI
Mu berry wing	*Poanes massasoit*	FS	NI
Ottoe skipper	*Hesperia ottoe*	FS	MI
Poweshiek skipperling	*Oarisma poweshiek*	FC, FS	NI
Regal fritillary butterfly	*Speyeria idalia*	FS	MI
Tawny crescent	*Phyciodes batesii*	FS	MI

[a] FE – Federal Endangered
FT – Federal Threatened
FC – Federal Candidate
FS – USFS/BLM Sensitive Species
BGEPA – Bald and Golden Eagle Protection Act

[b] NI - No Impact
MI - May impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species
NE - No Effect (ESA Determination)
NLAA - May Affect But Not L kely To Adversely Affect (ESA Determination)
NLJ- May Affect, but is not likely to jeopardize a proposed species or adversely modify critical habitat (Candidate Species Determination)

4.10 Special Status Plant Species

4.10.1 Direct and Indirect Effects

The impact analysis area for special status and watch list plant species is defined by the Project area and relevant areas associated with the habitat requirements of these species. The Project area includes the construction ROW, aboveground facilities, pipe storage and contractor yards, access roads, and ATWS.

The Project would result in both direct and indirect impacts to special status and watch list plant species. Direct impacts to two populations (contain 19 individuals total) of a watch list plant species on BLM land would include injury to or destruction of the plants, or seed displacement occurring at occupied habitat related to pipeline construction and operation. Indirect impacts to special status plant species and watch list plant species would include potential invasion of the habitat by non-native and noxious plant species, thus increasing competition for water, sunlight, space, or other resources. Impact levels depend upon timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

A summary of potential impacts to special status and watch list plant species that are known to occur or where habitat may exist within the Project area on federal lands can be found below.

Construction

Direct impacts to habitat for sensitive and watch list plant species as a result of construction activities would occur due to the removal of vegetation followed by the segregation and storage of topsoil along a majority of the project within the construction ROW. Disturbed areas often harbor noxious weeds and invasive non-native plant species. Indirect impacts to potential habitat of sensitive and watch list plant species may include invasion by noxious or non-native invasive plant species, thus increasing competition for water, sunlight, space, or other resources.

Direct impacts to sensitive and watch list plant species occurring within the construction ROW due to construction activities and the use of heavy equipment include injury to or destruction of the plants, or seed displacement occurring at occupied habitat during ground disturbing activities within the Project area. Fugitive dust from project related activities may indirectly cover plants during their aboveground stages, potentially reducing productivity and growth temporarily.

There were six documented individuals of the USFS Sensitive Species *Townsendia hookeri* along USFS land during the Project survey (see Table 4.10.1-1). One individual of *Townsendia hookeri* exists within the construction ROW on USFS land; however, HDD methods are proposed to avoid impacts to the individual.

TABLE 4.10.1-1

Bear Den Project
Location, Number of Populations and Individuals, Distance from Right-of-Way/Easement, and Potential Project Impacts on *Townsendia hookeri*

Line – Milepost (MP)	Property Owner	No. of Populations/ No. of Individuals	Feet from Right-of-Way/Easement	Project Impacts
AR-25 at MP 0.6	U.S. Forest Service	One population/two individuals	One within permanent easement	No impact – HDD proposed
			One 5 feet from construction right-of-way	No Impact – 25-foot buffer and signage would be installed
AR-31 at MP 3.6	U.S. Forest Service	Three populations/four individuals	Four identified during Project survey, 16 feet from right-of-way	No impacts – HDD proposed and 25-foot buffer and signage would be installed

A total of 14 potential populations of white locoweed (*Oxytropis sericea*), a watch list plant, were documented along or adjacent to the Project area on USFS and BLM land during biological surveys on

federal and NDTL land and an additional 4 populations were documented on private lands (see Table 4.10.1-2 below). These populations each contained between one and 200 individuals (see Table 4.10.1-2 below). Three populations fall within the Project construction ROW; however, at least two of these populations would be avoided and protected with a 25-foot buffer and signage because they are along the outer edge of the ROW. One population along Line AR-25 at MP 0.6 that contains 15 plants of white locoweed (0.017 acres) on USFS land would be avoided by HDD or adjustments to the construction work area. Two populations (19 individuals) of *Oxytropis sericea* would be impacted on BLM land however these populations are not listed as a Watch or Sensitive Species by the BLM. The other 10 populations (up to 247 individuals) of *Oxytropis sericea* occur on federal land approximately 70-feet to over 600-feet from of the construction ROW and would not be directly impacted by construction or operation of the pipelines. Populations on NDTL and private land may occur along the periphery of the construction ROW but will be protected during construction and will not be impacted.

TABLE 4.10.1-2

Bear Den Project
Location, Landowner, Number of Populations and Individuals, Distance from Right-of-Way, and Potential Project Impacts on *Oxytropis sericea*[a]

Line – Milepost (MP)	Property Owner[b]	No. of Populations/ No. of Individuals	Feet from Right-of-Way (ROW)	Project Impacts
AR at MP 6.1	U.S. Forest Service (USFS)	One population/ 20 individuals	26-feet	No impacts; 25-foot buffer and signage would be installed
AR-24 at MP 0.0	USFS	One population/ 15 individuals	600-feet	No impacts
AR-25 at MP 0.6	USFS	One population/15 individuals	Within permanent easement and temporary ROW	No impacts; HDD methods used to avoid population; 25-foot buffer and signage would be installed
AR-29 at MP 0.4	Bureau of Land Management	Two populations/ 19 individuals	Within temporary ROW	Project would impact these populations
AR-30 at MP 9.2	BLM	One population/10 individuals	40 feet from temporary ROW	No impacts; 25-foot buffer and signage would be installed.
AR-30 at MP 10.1	Private	One population/12 individuals	20 feet from temporary ROW	No impacts; buffer and signage would be installed
AR-31 at MP 2.1	USFS	One population/ 200+ individuals	70 feet	No impacts; 25-foot buffer and/or signage would be installed
AR-31 at MP 3.6	USFS	Four populations/ 15 individuals	Closest occurs along periphery of HDD location	No impacts; 25-foot buffer and signage would be installed
AR-31 at MP 5.4	NDTL	1 population/30 individuals	Population occurs along periphery of temporary ROW	No impacts; buffer and signage would be installed
AR-31 at MP 5.6	NDTL	1 population/40-50 individuals	Population occurs along periphery of temporary ROW	No impacts; buffer and signage would be installed
AR-33 at MP 0.0	USFS	1 population/ 15 individuals	680-feet	No impacts
AR-35 at MP 2.1	USFS	Two populations/ 17 individuals	Within 20 feet of HDD location	No impacts; 25-foot buffer and signage would be installed
AR-35 at MP 2.1	Private	1 population/3 individuals	Within 20 feet of HDD location	No impacts; 25-foot buffer and signage would be installed

[a] *Oxytropis sericea* was past flower during botanical survey restricting species identification; CEBCS would assume that these populations are the watch list species, Oxytropis sericea.

[b] Surveys were formally conducted on federal and NDTL properties; where identified on private land have been included in the table.

Operation and Maintenance

Potential direct impacts to the sensitive plant species and watch list species caused by project related activities include injury to or destruction of the plants, or seed displacement occurring at occupied habitat when removing woody vegetation along the permanent easement to maintain pipeline integrity. In order

to maintain pipeline integrity woody vegetation along the permanent easement would be removed therefore where the easement crosses woodlands, riparian woodlands and shrublands, these areas would be maintained in an herbaceous state. Where HDD methods are used to place the pipeline in these sensitive forested and shrubland habitats, maintenance of the woody vegetation would generally not be required. This change in habitat type in limited areas along the pipeline could indirectly impact those plant species that require woodland habitats and could positively impact those species that require open and herbaceous areas.

At the end of the pipelines useful life, potential direct impacts to the sensitive and watch list plant species caused by removal of the pipeline include injury to or destruction of the plants, seed displacement occurring at occupied habitat, and/or impact to potential habitat.

4.10.2 Mitigation – Special Status Plant Species

CEBCS would propose various mitigation measures to reduce, minimize, and avoid impacts to sensitive and watch listed plant species and their potential habitat within the Project area. These measures would include:

- CEBCS would reduce the Project construction ROW and permanent easement widths where possible to reduce impacts to sensitive habitats. Construction ROW widths where a single pipeline is proposed would be 50, 100, and 100 feet on federal, NDTL and private lands, respectively, whereas the permanent easement would be smaller in width at 20, 33, and 50 feet, respectively. Where two pipelines are proposed, the construction ROW would be 80, 125, and 125 feet on federal, NDTL and private lands, respectively compared to a permanent easement width of 50, 33, and 50 feet, respectively;
- 58 percent of the Project would be collocated with other ROWs (i.e., electric transmission, railroad, road) to decrease the amount of new ground disturbing activity in the region;
- trenchless HDD methods with an operational Horizontal Directional Drill and Contingency Plan would be used when crossing the Little Missouri River (twice), as well as at 38 other waterbody and 45 wetland crossings, and at two locations along Line AR-25 (MP 0.6) and Line AR-31 (MP 3.6) to avoid impacting sensitive and watch list plants on USFS land;
- a 25-foot buffer with signage would be installed around sensitive and watch list plant populations (identified in Tables 4.10.1-1 and 4.10.1-2) prior to construction and would be maintained during construction and reclamation efforts;
- populations of sensitive and watch list plants that are adjacent or just within the Project area would be noted on alignment sheet;
- little or no grading would occur in wetlands and there would be no use of mulch, lime or fertilizers in wetlands;
- 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;
- topsoil would be stripped, segregated, and stockpiled separately from subsoil along the entire ROW in order to maintain the native seed sources for reclamation of impacted areas;
- a majority of disturbed areas would be reclaimed following the CRMP (POD Appendix E);

- various permanent and temporary resource protection measures (i.e., sediment barriers, temporary slope breakers) would be used to protect the integrity of the ROW and prevent sediment deposition into sensitive wetland and waterbody resources;
- erosion control barriers would be removed and disposed of in a proper receptacle once the areas are deemed stable;
- contractor vehicles and equipment would arrive to the Project clean and weed-free as verified by an EI at check station;
- air compressors would be used to remove seeds and vegetation of noxious weeds at approved cleaning stations where vehicles leave an infested area along the Project;
- if straw sediment barriers are used they would be certified weed-free to prevent the further spread of invasive non-native vegetation;
- all areas disturbed by construction activities on federal land would be reclaimed using a seed mix of 9 native species including cool and warm season grasses and forb species and up to three warm and cool season native grasses will be used on NDTL and private lands disturbed by construction activities;
- seed that is certified or registered by the state of North Dakota (or the state of origin) would be used. Seed certification tags would be submitted to the BLM Authorized Officer (AO) and USFS McKenzie Ranger District prior to seeding efforts;
- the Weed Management Plan identifies specific weed populations and control measures during and after construction that would be implemented to manage noxious species;
- fugitive dust from both access roads and the construction of the ROW itself shall be watered as outlined in the CRMP (POD Appendix E) to control dust emissions;
- CEBCS would follow a written manual of procedures for conducting normal maintenance activities and for handling abnormal operations and emergencies;
- emergency shut-off block valves are proposed on either side of the Little Missouri River and are placed along the project ROW to meet federal regulations (49 CFR 195) to help reduce the amount of crude oil or produced water that could potentially spill into sensitive areas along the Project;
- a remote leak detection and monitoring systems would be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be discussed immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance; and
- at the end of the pipelines useful life, CEBCS would obtain the necessary authorizations from the BLM AO and other applicable local, NDTL, and federal agencies to agree on an acceptable facility Abandonment Plan; pipelines would not be removed from the ground if abandoned.

4.10.3 Effect Determination Summaries

Table 4.10.3-1 summarizes the effects determinations for the Project under Section 7 of the ESA and the February 2011 Regional Forester's Sensitive Species List for Region 1 analyzed above.

TABLE 4.10.3-1

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Effect Determination[b]
Smooth goosefoot	*Chenopodium subglabrum*	S1	NI
Dakota buckwheat	*Eriogonum visheri*	S2S3	MI
Blue lips	*Collinsia parviflora*	S2	MI
Torrey's Cryptantha	*Cryptantha torreyana*	S1	MI
Nodding buckwheat	*Eriogonum cernuum*	S1	NI
Missouri foxtail cactus	*Escobaria missouriensis*	SNR	MI
Sand lily	*Leucocrinum montanum*	S2	MI
Dwarf Mentzelia	*Mentzelia pumila*	S1	MI
Alyssum-leaved phlox	*Phlox alyssifolia*	S1S2	NI
Limber pine	*Pinus flexilis*	S1	NI
Lanceleaf cottonwood	*Populus x acuminate*	S2	MI
Alkali sacaton	*Sporobolus airoides*	S2	MI
Easter daisy	*Townsendia exscapa*	SNR	MI
Hooker's Townsendia	*Townsendia hookeri*	S1	MI
Spike bentgrass	*Agrostis exarata*	W	NA
Indian mi kvetch	*Astragalus astralis (astragalus aboriginum)Astragalus australis*	W	NA
Drummond's milkvetch	*Astragulus drummondii*	W	NA
Bentflower mi kvetch	*Astragulus vexilliflexus*	W	NA
Smooth spike-primrose	*Epilobim pygmaeum (Boisduvalia glabella)*	W	NA
Mountain brome	(*Bromus marginatus*)	W	NA
Dry spike sedge	*Carex siccata (Carex foenea)*	W	NA
Bulrush sedge	*Carex scirpoidea (Carex scirpiformis)*	W	NA
Rock clematis	*Clematis Columbiana var. tenuiloba (Clematis tenuiloba)*	W	NA
Spreading fleabane	*Erigeron divergens*	W	NA
Taproot fleabane	*Erigeron radicatus*	W	NA
Yellow fritillary	*Fritillaria pudica*	W	NA
Bristly mousetail	*Myosurus apetalus var.montanus*	W	NA
Cutleaf evening primrose	*Oenothera laciniata*	W	NA
Louisiana broomrape	*Orobanche ludoviciana ssp. Ludoviciana (Orobanche multiflora)*	W	NA
White locoweed	*Oxytropis sericea*	W	MI
Prairie fameflower	*Phemeranthu parviflorus (Talinum parviflorum)*	W	NA
Pondweed	*Potamogeton diversifolious*	W	NA
Varileaf potentilla	*Potentilla diversifolia*	W	NA
Balm-of-gilead	*Populus x jackii*	W	NA
Shrubby fivefingers	*Sibbaldiopsis tridentata (potentilla tridentata)*	W	NA
Heartleaf buttercup	*Ranunculus cardiophyllus*	W	NA
Persistent sepal yellowcress	*Rorippa calycina*	W	NA
Upright Carrionflower	*Smilax ecirrhata*	W	NA

TABLE 4.10.3-1 (cont'd)

Bear Den Project
U.S. Forest Service Sensitive and Watch List Plant Species with Potential to Occur within the Project Area

Common Name	Scientific Name	Status[a]	Effect Determination[b]

[a] North Dakota State Rank:
S1 – Critically Imperiled. At high risk because of extremely limited and/or rapidly declining population numbers, range, and/or habitat, making it highly vulnerable to global extinction or extirpation in the state;
S2 – Imperiled. At risk because of very limited and/or potentially declining population numbers, range, and/or habitat, making it vulnerable to global extinction or extirpation in the state.
S3 – Vulnerable. Potentially at risk because of limited and/or declining numbers, range, and/or habitat, even though it may be abundant in some areas
SNR – Not ranked.
W – Watch List Species.

[b] NI - No Impact
MI - May impact individuals or habitat, but would not likely contribute to a trend towards federal listing or cause a loss of viability to the population or species
NA - Not Applicable - Watch list plants do not have a statutory status until documented on USFS Land

4.11 Migratory Birds

4.11.1 Direct and Indirect Effects

The impact analysis area for migratory bird species is defined by the Project area and relevant areas associated with the life histories of these species. The Project area includes the construction rights-of-way, lots, access roads, and temporary, additional, or extra workspace areas.

The Project would result in both direct and indirect impacts to migratory bird species. Direct impacts to migratory bird species would include mortalities or displacement related to pipeline construction and operation. Indirect impacts to migratory bird species would include short-term displacement of mobile species (e.g., adult birds) in response to temporary habitat loss, increased noise levels, and human activity along the ROW. Impact levels depend upon timing and type of construction, sensitivity of the impacted species, and seasonal use patterns.

A summary of potential impacts to migratory bird species can be found below. A BA has been prepared for the Project to determine impacts to federally listed species (migratory birds include the whooping crane, piping plover, and least tern) as well as a federal candidate species (Sprague's pipit) that are likely to occur in the Project area. A BE has been prepared for the Project to determine impacts to USFS/BLM Sensitive Species and this includes five of the species included in Table 3.9.1-1 above (bald eagle, Baird's sparrow, burrowing owl, loggerhead shrike, and long-billed curlew).

Construction

Upland and wetland habitats crossed by the pipeline ROW may, such as cultivated cropland, introduced perennial grassland and forbland, native grassland, shrubland, forest and woodland, riparian areas, and herbaceous wetlands, provide suitable nesting, foraging, and/or breeding habitat for many birds listed under the MBTA as well as the BGEPA. Vegetation and ground disturbing activities as part of Project construction have the potential to affect migratory birds or their nests, if present at the time of construction activities. Disturbance to migratory bird species, including raptor species, during nesting is dependent on site-specific conditions, including vegetation types, terrain, tree abundance, line of sight, and adaptation of the species to development. Nesting eagles can be very sensitive to disturbances near the nest site and may abandon the nests as a result of low disturbance levels, even those from pedestrian traffic. Short-term impacts to migratory birds would consist of loss of habitat or the temporary displacement due to construction activities and increased noise and traffic. Upland and wetland forested habitats would be affected most substantially, with a long-term conversion of wooded areas to successional stages in the construction ROW and a permanent conversion to scrub-shrub or herbaceous levels within the

permanent pipeline ROW. The permanent pipeline ROW width is variable along the Project and ranges from 20-feet on federal lands where a single pipeline is proposed up to 50-feet along a majority of the Project where two pipelines are proposed. A permanent 33-foot-wide ROW is proposed on all NDTL lands. The permanent conversion of upland and wetland habitats to scrub-shrub and/or herbaceous habitats along the permanent ROW is approximately 3.6 acres. Habitat fragmentation created by the temporary loss of habitat and the creation of open early successional and induced edge habitats could also decrease the quality of habitat and food sources (e.g., insects) for some grassland bird species.

Operation and Maintenance

After pipeline construction has been completed, CEBCS would be responsible for monitoring, maintaining, and inspecting the operation of the pipeline system in accordance with federal and state regulations. Aerial inspection of the pipelines would be conducted approximately every two weeks, not to exceed three weeks, with follow-up ground inspections as necessary based on aerial inspection results. Indirect impacts to migratory birds could result from increased noise and human presence during pipeline maintenance. Additionally, CEBCS plans to periodically clear woody vegetation within the permanent ROW in order to maintain accessibility to the rights-of-way and to accommodate pipeline integrity.

4.11.2 Mitigation – Migratory Birds

As part of the preliminary routing process, CEBCS would reduce migratory bird impacts in several ways by avoiding sensitive and rare habitats (i.e., mineral deposits, talus slopes, and native prairie) where possible, reducing the ROW widths, collocating the pipeline with existing utility corridors (i.e., other pipelines, powerlines, etc.), and placing additional temporary workspace (ATWS) at least 50 feet from sensitive resources. Where practicable, CEBCS would use the HDD method to minimize and avoid surface impacts to riparian areas. Specifically, CEBCS would avoid most surface disturbance at 40 (11 of these crossings would require a temporary 15-foot wide travel lane to access remote ROW) of the 61 waterbody crossings and 45 (13 of these crossings would require a temporary 15-foot wide travel lane to access remote ROW) of the 69 wetlands crossed during construction of the Project.

CEBCS would commit to conservation efforts to ensure that environmental impacts to migratory birds have been reduced or minimized during Project construction and during operations as described above and as detailed in their Migratory Bird Impact Assessment, Mitigation, and Compliance Plan (POD Appendix H). A protection measure includes conducting pre-construction surveys (ground surveys and aerial surveys for raptor nests) to identify, protect, and avoid nests during construction. Migratory birds that are Species of Concern would receive a 30-foot nest buffer. Raptor species would be protected as outlined in Table 4.11.2-1 below. All other migratory bird nests would be protected but there would not be an established buffer distance for these species; nest buffers would vary depending upon the species and their tolerance to activities near them (FWS, 2012).

CEBCS would also comply with the provisions of the BGEPA, which prohibits anyone without a permit issued by the Secretary of the Interior from taking bald and golden eagles, including their parts, nests, or eggs. If CEBCS identifies any active nesting sites during construction, construction would be stopped in the specific area and the FWS would be contacted for further direction. Additionally, CEBCS would maintain a minimum buffer around identified raptor nest sites during the proposed dates as outlined in table 4.11.12-1 below.

TABLE 4.11.2-1

Bear Den Project
Minimum Distance and Timing Limitations of Disturbance of Active Raptor Nests from Oil and Gas Structural Developments.

Species – Nest	Minimum Distance from Oil and Gas Structural Developments (miles)	Minimum Distance and Timing Limitation for Noise of Activities (miles and dates)
Bald Eagle	1.0	1.0 from 2/1 to 7/31
Golden Eagle	0.5	0.5 from 2/1 to 7/31
Peregrine Falcon	1.0	1.0 from 2/1 to 7/31
Prairie Falcon	0.25	0.25 from 4/1 to 7/31
Merlin	0.5	0.5 from 4/1 to 7/31
Ferruginous Hawk	0.5	0.5 from 3/1 to 7/31
Burrowing Owl	0.25	0.25 from 4/15 to 8/31

Source Land and Resource Management Plan (LRMP). 2001. Land and Resource Management Plan for the Dakota Prairie Grasslands North Region. U.S. Forest Service. Bismarck, North Dakota.

Consistent with EO 13186 guidance, CEBCS would develop restoration and enhancement measures that would reduce impacts to or benefit migratory bird species of concern. Following construction of the pipeline, restoration and reclamation of the disturbed work areas would occur following methods outlined in CEBCS' CRMP (POD Appendix E). During Project construction CEBCS proposes to remove and store topsoil for reuse during reclamation. Topsoil segregation benefits revegetation success as most plant-essential nutrients are found at or near the surface. Disturbed areas would be de-compacted as needed and would be subject to final grading. In addition, CEBCS would provide funds for the purchase of approximately 109 acres of grassland conservation easements to compensate for the potential temporary loss of habitat for migratory birds.

No foreseen adverse impacts from Project construction on migratory birds are anticipated. In addition CEBCS would implement BMPs and protective measures provided in their CMRP (POD Appendix E) to prevent or mitigate any adverse effects to the environment resulting from Project operations. Therefore, no foreseen adverse impacts from operational activities on migratory birds are anticipated.

4.12 Aquatic Wildlife

4.12.1 Direct and Indirect Effects

Construction

Impacts to aquatic wildlife during pipeline construction are dependent on the resources, construction methods, time of the crossing, duration of in-stream construction activities, water volume and velocity of flow, and mitigation measures employed during construction. If in-stream project related activities were to occur in perennial waterbodies, then aquatic wildlife could experience a temporary loss of habitat. Potential impacts resulting from open-cut crossing methods include disturbance of the streambed, resulting in impacts to subsurface macroinvertebrates and potential interference with hyporheic flows (mixing of shallow groundwater and surface water). Construction would result in potential temporary reduction of habitat, alteration of habitat structure, alteration of substrate and bank structure, and changes in benthic invertebrate communities.

Surface disturbing activities near waterbodies could contribute increased sedimentation and turbidity to adjacent waterbodies. This may occur when open-cut methods are used to cross perennial or intermittent streams, when stripping vegetation from the ROW, or when accessing specific HDD sites by crossing a waterbody. Increased amounts of fine sediments deposited on streambeds is a major cause of changes in species structure and abundance and may even lead to local extinctions of invertebrates and fish species (USGS, 2012). Aquatic wildlife resources could also be indirectly affected by improper discharge of hydrostatic test water, spills of hazardous materials, and stormwater runoff.

During construction, the pipeline would be pressure tested with water to ensure the system is capable of withstanding the operating pressure for which it was designed. Water for pressure testing would be obtained from municipal sources. Internal test pressure and durations would be in accordance with Title 49 CFR Part 195. Environmental impacts from discharge of hydrostatic test water would be minimized by applying the measures in CEBCS' Hydrostatic Test Plan (POD Appendix P). The use of specific construction practices would prevent further water quality impacts to these waterbodies and thus the aquatic wildlife from the discharge of hydrostatic test water.

Operations and Maintenance

During operations, impacts to surface water resources would occur if a pipeline leak or rupture released crude oil. The severity and duration of such an impact would depend on its location, the volume of oil released, and the spill response and countermeasures implemented.

4.12.2 Mitigation

As part of the preliminary routing process, CEBCS would reduce impacts to downstream and aquatic resources by minimizing the number of stream crossings, reduce the ROW widths where practicable, and place additional temporary workspace (ATWS) at least 50 feet from sensitive waterbodies. During construction, where practicable, CEBCS would use the HDD method to minimize and avoid surface impacts to waterbodies. Specifically, CEBCS would avoid most surface disturbance at 40 (11 of these crossings would require a temporary 15-foot wide travel lane to access remote ROW) of the 61 waterbody crossings during construction of the Project. The construction and permanent ROW where a single pipeline is proposed would be 60 and 50 feet, respectively, through wetlands and waterbodies. Where two pipelines are proposed, the construction and permanent ROW would be 75 and 50 feet, respectively, through wetlands and waterbodies. Potential impacts from sedimentation, turbidity, and potential contaminants encountered during and after construction would be minimized by implementation of the BMPs and measures included in CEBCS' HDD and Contingency Plan (POD Appendix G) and SWPPP (POD Appendix F). In addition, CEBCS would obtain hydrostatic test water from a municipal source, thus, eliminating the need for surface water and the increased potential for depletion of the Little Missouri River system, entrainment of aquatic species, or increasing turbidity or sedimentation of aquatic resources through these activities.

The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system, during operation, the pipelines would be monitored 24 hours a day, 365 days a year using a sophisticated SCADA system. This system would provide real time data used to detect leaks and allow CEBCS to initiate a system shutdown if a leak is detected. In addition, direct observation of the ROW would occur approximately once every two weeks. These monitoring efforts would include aerial surveys, ground surveys, and a public and landowner awareness program for leak detections. The PRAECA report (AECOM, 2013) provides additional information regarding mitigation measures for leak detection during operation.

4.13 Terrestrial Wildlife

4.13.1 Direct and Indirect Effects

Construction

The primary effect on wildlife would be the temporary loss of habitats and displacement of wildlife during construction. Prior to construction of the proposed pipeline facilities, CEBCS would clear vegetation from the construction rights-of-way and ATWS. Construction within the pipeline ROW and use of ATWS would affect approximately 912 acres of land, of which about 454 acres would be retained as new permanent ROW. The remaining 458 acres used for temporary construction ROW and ATWS would be allowed to revert to prior use following construction (refer to Table 4.7.1-1 in Vegetation).

Larger and more mobile wildlife, including big game and large mammals, would vacate the construction area during construction. Large expanses of available habitat lie adjacent to the construction work areas and mobile species would disperse to those areas, thereby only temporary displacement would occur. Smaller, less mobile wildlife species, such as voles and mice, may experience some direct mortality during clearing and grading activities; however, the losses would most likely be minor and insignificant on the local population level. Reptiles and amphibians may experience mortality or injury as a result of being crushed by vehicles and heavy equipment on the construction site or falling into excavated trench areas upon entering a construction site and exposure or ingestion of toxicants present in the environment from construction-related activities or spills,

The possibility that construction could cause permanent displacement of wildlife or result in a decrease in wildlife population densities due to long-term changes in habitat is highly unlikely. Wildlife species occupying grassland may disperse into nearby habitats during construction, including marginal habitats, resulting in lowered reproductive success and survival due to increased competition or other effects of being forced into sub-optimal habitats; however, the affected habitat is minimal in relation to the adjacent habitat available. Grasslands and other habitats are anticipated to be restored and returned to a pre-construction condition within 10 years following construction. Wildlife populations are expected to return to levels comparable to adjacent, undistributed areas within a short time period, and it is anticipated that no significant habitat alteration or detrimental effects to local wildlife populations are likely to occur as a result of construction of the Project.

Operations and Maintenance

After pipeline construction has been completed, CEBCS would be responsible for monitoring, maintaining, and inspecting the operation of the pipeline system in accordance with federal and state regulations. The frequency of inspection would be approximately every two weeks (26 times per year). Indirect impacts to terrestrial wildlife could result from increased noise and human presence during pipeline maintenance.

4.13.2 Mitigation Terrestrial Wildlife

Mitigation measures that would be implemented to minimize or avoid impacts to terrestrial wildlife include the following:

- CEBCS would reduce the Project construction and permanent rights-of-way where possible;
- CEBCS would avoid sensitive habitats (i.e. wetlands, waterbodies, native prairie) during project planning to the extent possible;
- CEBCS would collocate 58 percent of the Project with other rights-of-way (i.e., electric transmission, road, existing pipelines);
- trenchless HDD methods with an operational Horizontal Directional Drill and Contingency Plan (POD Appendix G) would be used when crossing the Little Missouri River and its major tributaries as well as most wetland crossings;
- little or no grading would occur in wetlands and there would be no use of mulch, lime or fertilizers in wetlands;
- 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;

- efforts would be taken to salvage and segregate topsoil in native prairie (and other habitat types along the Project) to maintain the native seed sources for reclamation of impacted areas;
- there would be no depletion of water from the Little Missouri River and its tributaries to conduct hydrostatic testing of the pipeline;
- by implementing the Spill Prevention Control and Contingency Plan (POD Appendix L), the project's short- and long-term impact on groundwater and surface water resources would be greatly reduced or limited;
- various permanent and temporary resource protection measures would be used to protect the integrity of the ROW and prevent sediment deposition into sensitive wetland and waterbody resources;
- contractor vehicles and equipment would arrive to the Project clean and weed-free;
- air compressors would be used to remove seeds and vegetation of noxious weeds where vehicles leave an infested area along the Project;
- if straw sediment barriers are used they would be certified weed-free to prevent the further spread of invasive non-native vegetation;
- the Weed Management Plan (POD Appendix K) identifies specific weed populations and control measures during and after construction that would be implemented to manage noxious and invasive species;
- construction vehicles would be properly muffled to minimize noise;
- fugitive dust from both access roads and the construction of the ROW itself shall be watered as outlined in the Construction Reclamation and Mitigation Plan (POD Appendix E) to control dust emissions;
- safeguards would be implemented in pipeline design and construction to mitigate and detect for pipeline corrosion, to monitor for and shut down pipeline operation if leaks are detected, and to mark the location of the pipeline to prevent third party excavation damage; and
- CEBCS would follow a written manual of procedures for conducting normal maintenance activities and for handling abnormal operations and emergencies; and at the end of the pipelines useful life, CEBCS would obtain the necessary authorizations from the BLM AO and other applicable local, state, and federal agencies to agree on an acceptable facility Abandonment Plan.

4.14 Cultural Resources

4.14.1 Direct and Indirect Effects

Potential direct impacts to known and unknown cultural resources include physical disturbance associated with Project-related construction activities. Indirect impacts could include soil erosion and the potential for illegal artifact collecting and vandalism due to the presence of increased numbers of people during construction and increased public access. Visual impacts could result from the introduction of visual intrusions (e.g., aboveground ancillary facilities) resulting in changes in the setting surrounding such resources.

The BLM 8100 Manual states that cultural resources need not be determined eligible for the NRHP to receive consideration under NEPA. Potential impacts to historic properties are assessed by applying the

"criteria of adverse effect" (36 CFR 800.5[a][1]). "An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association." The analysis of impacts using the criteria is limited to those resources that are either listed or recommended eligible for listing in the NRHP.

Seventeen cultural resources, two of which are eligible for the NRHP (32MZ487/32DU1285 and 32MZ718), are located in the direct APE. Management recommendations for these historic properties are presented in Table 4.14.1-1.

TABLE 4.14.1-1

Bear Den Project
Management Recommendations for Historic Properties Located within the APE

Site No.	Site Type	Management Recommendations
32MZ487/32DU1285	Archaic and late prehistoric artifact scatter	Reduce construction right-of-way and fence; Monitor ground disturbing activities
32MZ718	Historic farmstead	Avoid via HDD; Conduct Level II Documentation ; Fence and monitor road through site

The Project would cross through historic property 32MZ487/32DU1285. While this is an NRHP-eligible site, the Class III Inventory found no evidence that significant cultural materials are present within the construction ROW. Therefore, it is recommended that the portion of site 32MZ487/32DU1285 within the construction workspace does not contribute to its eligibility and direct impacts from construction activities on subsurface cultural materials are not anticipated. Nonetheless, the construction workspace will be narrowed to the width of the permanent ROW (50 feet) and construction monitoring by an archaeologist who meets the Secretary of the Interior's Historic Preservation Professional Qualifications Standards will be conducted during all ground-disturbing activities inside and within 30 meters of the site boundary.

The Project would also cross historic property 32MZ718. Direct effects to the buildings and any potential subsurface features would be avoided through the use of the HDD method to install the pipeline underneath the historic property. The exact depth of the HDD is yet to be determined, but will be installed no less than 15 feet below the ground surface. The existing two-track road which bisects the site is proposed for construction-related use to access other parts of the Project area. Potential direct effects of this use include the degradation of the road due to an increase in vehicle and heavy equipment traffic and indirect effects include an increased risk for vandalism; therefore, mitigation is recommended prior to construction.

The BLM, USFS, and SHPO have implemented a Memorandum of Agreement (MOA) to document the proposed mitigation. This mitigation includes fencing and monitoring the site during construction activities, placing mats on the road if access is required during weather conditions where rutting of the road is likely to occur, and preparing Level II documentation (Athearn, 1990) of the site in order to permanently record the historic homestead prior to the use of the two-track road as a project access route.

Isolated find 32MZx1282 is a rock cairn of indeterminate age and cultural affiliation which remains unevaluated for the NRHP. The cairn lies within the APE; however, direct effects would be avoided as the Project will avoid the cairn and it will be flagged and monitored during construction.

These actions will minimize and mitigate adverse effects to these two historic properties and isolated find.

Potential indirect effects to previously recorded historic properties located adjacent to the APE as a result of drainage or soil erosion would be minimized through implementation of procedures outlined in CEBCS' CRMP and SWPPP (POD Appendices E and F). Other indirect effects, such as illegal collecting of artifacts and inadvertent damage to archaeological sites, could occur in the area of the Project due to an increase in the number of workers during construction and increased public access. In accordance with

the Environmental Inspection and Compliance Monitoring Plan (POD Appendix M), Project-related personnel would be educated as to the sensitive nature of the resources and a strict policy of prohibiting collecting of these resources would be implemented. To prevent unauthorized use of the ROW, access would be blocked at locations specified by agencies and/or private landowners. For example, the need for potential off-highway vehicle (OHV) blocking measures would be assessed in areas where the Project crosses OHV use trails to discourage OHV access to the ROW

4.14.2 Mitigation – Cultural Resources

Avoidance by HDD is recommended for Site 32MZ718; however, the existing two-track road through the sites is proposed for construction-related use, and mitigation is recommended prior to its use. The mitigation would be accomplished through Level II documentation as defined by Athearn (Athearn 1990). Additionally, the road would not be upgraded by mechanical blading nor would it be used during weather conditions where rutting of the road is likely to occur. In situations where use of the road is unavoidable during wet conditions, timber matting would be placed on the road to avoid additional impacts. It is also recommended that exclusion fencing be placed along the road through the site and a monitor should be present. These recommendations are documented in the MOA executed between the BLM, USFS, and SHPO on April 24, 2013.

Unanticipated Discovery of Cultural Resources or Human Remains

Protection measures for unknown cultural resources are described in the Plan for Unanticipated Discovery of Cultural Resources or Human Remains During Construction (POD Appendix I). This Plan provides guidance if any previously unknown archaeological sites are discovered during Project construction. All construction activities would cease in the area of the discovery and the BLM, North Dakota SHPO, and/or applicable land management agency or private landowner would be notified of the find. Steps would be taken to protect the site from vandalism or further damage until the BLM and North Dakota SHPO could evaluate the nature of the discovery. If the site qualifies as a historic property, a mitigation plan would be developed and executed before construction could resume in the vicinity of the discovery. If the site does not qualify as a historic property, construction could resume in the vicinity of the discovery.

If construction or other Project personnel discover what may be human remains, funerary objects, or items of cultural patrimony, construction would cease within the vicinity of the discovery, and the BLM, North Dakota SHPO, and/or applicable land-managing agency or private landowner would be notified of the find. Any discovered Native American human remains, funerary objects, or items of cultural patrimony found on federal land would be handled in accordance with the NAGPRA (PL 101-601, implementing regulations at 43 CFR 10). Non-Native American human remains found on federal, NDTL, or private lands would be handled in accordance with the NDCC §23-06-27 and the administrative rules in the NDAC Chapter 40-02-03.

4.14.3 Mitigation – Tribal Treaty Rights and Interests

Public lands retain social, economic, and both traditional and contemporary cultural value for tribal people, as well as contemporary and ongoing spiritual and cultural uses (United Nations Declaration on the Rights of Indigenous Peoples, 2008). Some of the tribes who are consulting parties on the project with traditional or cultural affiliation with the project area may have treaty rights that give them the right to hunt, fish, gather, and conduct traditional and cultural activities on federal lands crossed by the Project. BLM will continue to consult with the federally recognized tribes that have treaty rights pertinent to the project area, that have aboriginal territories encompassing the project area, or that have expressed an interest in the project area. Consultation can help protect treaty rights and address other tribal concerns by obtaining valuable information from participating tribal representatives concerning areas and resources of importance to the tribes that may be potentially be impacted by the proposed project.

During the course of tribal consultation efforts, the representatives of the participating tribes were asked to provide information on the location of any cultural properties in close proximity to the proposed project

area that may be of religious and/or traditional cultural concern. The avoidance of any such properties through project realignment and/or modification is the preferred method of mitigating any potential adverse impacts to cultural properties of concern to the tribes. The Turtle Mountain Band of Chippewa and the Three Affiliated Tribes recommend tribal monitoring during construction within the boundaries of site 32MZ487/32DU1282 and a location where there is an isolated core of Knife River flint to ensure unanticipated finds are treated according to the Plan for Unanticipated Discovery of Cultural Resources or Human Remains During Construction (POD Appendix I) and meet tribal expectations for treatment. Recommendations from the Crow Creek Sioux Tribe, Northern Cheyenne Tribe, Yankton Sioux Tribe, and Fort Peck Assiniboine and Sioux Tribes are pending and will be included in the final decision for the project.

4.15 Paleontological Resources

4.15.1 Direct and Indirect Effects

Construction

The issue of concern with regard to paleontological resources is the potential damage and loss of scientifically important fossils from ROW clearing, grading, trench excavation, and construction of other pipeline facilities. Potential impacts to fossil localities during construction would be both direct and indirect. Direct impacts to or destruction of fossils would occur from trenching or facility construction activities conducted through significant fossil beds. Indirect impacts during construction would include erosion of fossil beds due to slope re-grading and vegetation clearing or the unauthorized collection of scientifically important fossils by construction workers or the public due to increased access to fossils along the ROW

Prior to ground-disturbing activities, areas with a PFYC rank of 3 or higher should have a ground survey conducted by a qualified and BLM-permitted paleontologist to identify potential areas of fossil concentration. Protective measures should be implemented where specific paleontological resources have either been identified during field survey or where the geologic unit is rated as having a 4 or higher rank. The protection measures vary in intensity depending on underlying geological unit anticipated to be disturbed by surface grading and trench excavation.

In addition, all Project personnel should be instructed that if any mineralized bones or other potential fossils are discovered by Project personnel during construction activities, regardless of the formation's PFYC rank, the fossils should be left in place untouched, and the Environmental Inspector and a qualified and BLM-permitted paleontologist should be contacted immediately to assess the discovery and make further recommendations according to the Plan for Construction Monitoring and Unanticipated Discoveries of Paleontological Resources (POD Appendix J).

Operation

The primary impact for paleontological resources during pipeline operation is potential damage and loss of scientifically important fossils from maintenance activities. Any potential effects to fossils from maintenance activities would be isolated due to the probable dispersed nature of those activities.

Normal operation of the Project would not be expected to disturb important paleontological resources. If there are maintenance activities that would result in surface disturbance, it would occur within previously disturbed ROW, and in that case are not likely to affect paleontological resources. However, any ground disturbing activity in undisturbed areas within the ROW should be reviewed and mitigated using the same guidelines outlined here.

4.15.2 Mitigation – Paleontological Resources

Paleontological surveys are on-going and would be complete prior to any ground disturbance activities. Depending on the results of the surveys, some geologic units could require inspection or monitoring during construction (i.e., all PFYC ranked 4-5 units) by a BLM-permitted paleontologist. Specific protection measures for paleontological resources are included in the Plan for Construction Monitoring and Unanticipated Discovery of Paleontological Resources (POD Appendix J).

During construction any significant fossils collected from BLM lands would be prepared (repaired) to the point of curation and transferred to a BLM-approved paleontological repository. Land owners would be consulted regarding the significant fossils on their lands and these fossils would be left in place with land owner consent, or collected and returned to the land owner or donated to a paleontological repository.

4.16 Visual Resources and Scenic Byways

4.16.1 Direct and Indirect Effects

Effects on visual resources resulting from construction of the Project would be limited primarily to the alteration of existing vegetation and land contours. During construction, open trenches and spoil piles would result in color changes to the landscape. Strung pipe and construction equipment located on the ROW would temporarily affect the visual horizon. In addition, heavy equipment would create tracks, compress vegetation, and expose soil within the authorized construction corridor. Such effects would be limited to the duration of construction and therefore, would be temporary. During construction of the Project, strung pipe would be lowered in to open trenches; the open trench would be backfilled from the spoil piles; the disturbed land would be recontoured to preconstruction conditions; and the ROW would undergo final grading and would be reseeded.

During operation of the Project, the majority of the visual impacts would be temporary, although periodic clearing of woody vegetation in some draws and along riparian zones would be required if it occurs within the permanent easement. Otherwise, the potential impacts to most current land uses would be brief since disturbed areas would be restored to pre-construction conditions after construction and would not require long-term vegetative maintenance. Within a few years after reclamation, vegetation establishment on the permanent ROW would reduce visual impacts. The only long-term visual impacts would be those associated with new ROW creation through woody draws and some riparian areas, and permanent aboveground facility, which with the exception of the storage/transfer facilities, would be minor in scope.

4.16.2 Mitigation – Visual Resources and Scenic Byways

CEBCS would minimize temporary and visual impacts where feasible by collocating 40.2 miles (58.6%) of the Project with existing utility (e.g., other pipelines, powerlines, etc.), railroad, or road rights-of-way. CEBCS considers its proposed pipeline to be “collocated” with existing rights-of-way where its proposed construction and/or operational ROW abuts an existing pipeline, utility, or road ROW; or its proposed pipeline route is located generally parallel to a pipeline, utility, or road ROW and does not stray from this general alignment for a distance greater than 300 feet. To help minimize the visual impact of permanent aboveground facilities, the facilities would be painted to blend into the existing landscape. Additionally, the most significant aboveground facility, the storage/transfer facility, would be located on private lands adjacent to similar existing industrial development.

4.17 Hazardous or Solid Wastes

4.17.1 Direct and Indirect Effects

Pipeline construction requires the use of multiple substances that, if not handled correctly, could pose a threat to the environment and human health. Crude oil is considered a hazardous material and is regulated by the USDOT when it is in transit through a pipeline. The EPA has determined that an oil spill be deemed harmful to the public or the environment, when it violates water quality standards, causes a film or discoloration of surface water, or causes a sludge to be deposited on land or beneath the water surface. NDDH regulations require that a spill of any size which may cause pollution to Waters of the State be reported immediately; however, it is acknowledged that collecting information and assessing the situation may take time (NDDH, 2009).

Table 4.17.1-1 lists hazardous materials that could be used in the construction or operation of the pipeline, along with their associated regulations. Many of these hazardous materials are subject to specific regulations during transportation, storage, and use, but are not necessarily considered hazardous waste if they are recycled properly. Many of these hazardous materials require federal notification if they are released in a large enough quantity. Some hazardous material releases do not need to be reported if they are properly cleaned up and are under the reportable quantity.

The use of hazardous materials during construction and/or operation could lead to soil and/or water contamination if a spill were to occur. The majority of hazardous material release incidents happen at random, and it is challenging to predict how a release could affect the surrounding environment. Possible risks associated with the Project include pipeline corrosion, excavation damage, materials and construction incidents, hydraulic events, ground movement, and flooding. These risks have been assessed based on historic PHMSA data, and do not reflect operation history for the Project specifically. The Project was designed with consideration of these risks and would include features that lower the potential for an incident involving hazardous waste. By assessing possible risks, implementing a spill plan, and developing emergency procedures in response to that assessment, hazardous material release damage can be minimized. No hazardous material releases are anticipated during construction of the Project, but CEBCS has developed a Spill Prevention, Containment, and Counter Measure Plan as a precaution. In addition to hazardous materials used during construction of the pipeline, operation of the Project could result in a release of crude oil or produced water from the pipeline and in the unlikely event of a pipeline rupture, crude oil is considered a regulated hazardous material by the EPA.

Pipeline projects generally produce a minimal amount of solid waste, and any waste that is generated is expected to be non-hazardous. Solid waste that is considered hazardous may be generated by Project construction or operation, but is not anticipated. Waste materials such as pipe coating, spent welding rods, containers, cans, lunch wrappers, used engine oil, and other wastes from construction activities would be collected daily, placed in containers, properly accumulated, and disposed of at an approved landfill and/or waste disposal site. Contractors would also provide trash barrels or dumpsters to collect construction site trash (e.g., lunch wrappers), and solid wastes would routinely be removed and disposed of at an approved facility. To sequester, control, and properly dispose of human waste generation, CEBCS would provide approximately 12 portable toilets throughout the Project area, which would be maintained 2-3 times per week.

TABLE 4.17.1-1

Bear Den Project
Hazardous Materials that Could Be Used During Construction of the Project

Material/Hazardous Substances	Associated Regulations	Reportable Quantity (pounds) If Applicable
Miscellaneous Materials		
Antifreeze (Ethylene glycol)	CERCLA	5000
Batteries	NDAC	
Cadmium	CERCLA	10
Lead	CERCLA	10
Nickel hydroxide	CERCLA	10
Potassium hydroxide	CERCLA	1000
Sulfuric acid	CERCLA	1000
Cleaners		
Hydrochloric acid	CERCLA	10
Fuels		
Diesel fuel	USDOT, SARA, Oil Pollution Act	[a]
Gasoline	USDOT, SARA, Oil Pollution Act	[a]
Natural Gas Liquids		[a]
Ethane		[a]
Propane		[a]
Butane		[a]
Pipeline Materials		
Coating	USDOT, CERCLA, SARA	
Aluminum oxide		10
Cupric sulfate solution	CERCLA	10
Cupric sulfate		
Diethanolamine	CERCLA	100
LP gas		
Benzene	CERCLA	10
n-Hexane		
Propylene		
Molecular sieves		
Aluminum oxide	CERCLA	10
Pigging waste		
Pipeline Primer		
Napthalene		
Toluene	CERCLA	1000
Potassium hydroxide	CERCLA	1000
Rubber resin coatings		
Acetone	CERCLA	5000
Coal tar pitch		
Ethyl acetate	CERCLA	5000
Methyl ethyl ketone	CERCLA	5000
Toluene	CERCLA	1000
Xylene	CERCLA	100

TABLE 4.17.1-1 (cont'd)

Bear Den Project
Hazardous Materials that Could Be Used During Construction of the Project

Material/Hazardous Substances	Associated Regulations	Reportable Quantity (pounds) If Applicable
Fertilizers		
Lead-free thread compound		
Copper	CERCLA	5000
Lubricants	Oil Pollution Act	
1,2,4-trimethylbenzene		
Barium	CERCLA	1000
Cadmium	CERCLA	10
Copper	CERCLA	5000
n-Hexane		
Lead	CERCLA	10
Manganese		
Nickel	CERCLA	100
PAHs		
POM		
Zinc	CERCLA	1000
Motor oil	Oil Pollution Act	
Paints	USDOT, CERCLA, SARA	
Aluminum		
Barium	CERCLA	1000
n-Butyl alcohol	CERCLA	5000
Cobalt	CERCLA	1000
Lead	CERCLA	10
Manganese		
PAHs		
POM		
Sulfuric acid	CERCLA	1000
Toluene	CERCLA	1000
Triethylamine	CERCLA	5000
Xylene	CERCLA	100
Sealants		
1,1,1-Trichloroethane	CERCLA	1000
n-Hexane		
PAHs		
POM		
Solvents	CERCLA, SARA	10
Starting fluid		

[a] The North Dakota Department of Health identifies any fuel that could enter a waterbody is considered a reportable quantity (NDDH, 2009).

4.17.2 Mitigation – Hazardous or Solid Wastes

Potential effects hazardous and solid waste during construction have been considered, and appropriate measures, such as the development and implementation of a SPCC Plan, would be implemented to minimize these effects. In addition to the SPCC Plan, the Project would implement the following measures:

- non-toxic cleansers (such as citrus-based cleaning compounds) would be used whenever possible to reduce regulatory compliance concerns;
- mechanical cleaning techniques (such as using high pressure or high temperature water) would be utilized when possible to clean equipment;
- water-based paints would be used instead of oil-based paints whenever possible.
- chemicals and materials would be properly inventoried so that they could be reclaimed or recycled properly when no longer needed. This would reduce the need to treat some chemicals as hazardous waste;
- contractors and construction workers would be properly trained in waste minimization techniques and waste classification;
- portable toilet facilities would be provided throughout the Project area, and would be maintained 2-3 times per week; and
- fueling and maintenance of equipment would be conducted in designated areas within the ROW, outside of wetlands and waterbodies in accordance with CEBCS' SPCC Plan.

During operation of the pipeline, CEBCS would implement a wide array of protection measures to minimize the potential effects of hazardous or solids wastes. Pipelines are one of the safest forms of crude oil transportation and provide a cost-effective and safe mode of transportation for oil on land. Overland transportation of oil by truck or rail produces higher risk of injury to the general public than the proposed pipeline (USDOT, 2012). Per federal regulations, CEBCS would have an established maintenance, inspection, and repair program that would ensure the integrity of the pipeline during operations. CEBCS's pipeline maintenance program would be designed to maintain the safe and reliable operation of the pipeline and minimize the risk of a spill or leak of hazardous material. CEBCS also would mitigate third-party excavation risk by implementing comprehensive Public Awareness and Damage Prevention programs focused on education and awareness in accordance with 49 CFR Section 195.440 and API RP1162. Further, CEBCS would complete regular visual inspections (ground or aerial) of the ROW as per 49 CFR Section 195.412 and monitor activity in the area to prevent unauthorized trespass or access.

To mitigate the effects of corrosion on the pipeline, CEBCS would construct the produced water system out of a reinforced high-density polyethylene pipeline material that is resistant to corrosion. In addition, CEBCS would apply a fusion bond epoxy or other type of protective pipeline coating to the external surface of the steel crude oil pipeline to prevent corrosion. A cathodic protection system would be installed on the steel pipeline composed of engineered metal alloys or anodes, which would be connected to the pipeline.

The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system the pipeline would be monitored 24 hours a day, 365 days a year from the control center using a sophisticated SCADA system. CEBCS would implement multiple leak detection methods and systems that are overlapping in nature and progress through a series of leak detection thresholds.

Lastly, CEBCS would respond to any incidents. Spill containment measures and implementing actions would be identified and would mitigate adverse effects resulting from an unanticipated spill of crude oil or produced water. Specific mitigation for hazardous and solid wastes has been developed and is found in the Bear Den Project PRAECA Plan (AECOM, 2013).

4.18 Social and Economic Conditions

4.18.1 Direct and Indirect Effects

Population

Construction of the Project would require a workforce of approximately 200-250, and operation would require 15-20 permanent employees. It is expected that a percentage of the workforce would bring along dependents. While this is a notable increase in population size for Dunn and McKenzie County, the increase would be temporary and is not expected to have a significant, lasting impact on those counties. The permanent workforce required for the Project is so small that it would not have a noticeable impact on population dynamics in the Project area.

Economic Conditions

The Project would most likely trigger a small influx of money to the local economy as the population of gainfully employed population would increase during construction of the Project.

Housing

The Project's construction period would be relatively short, and temporary construction employees would likely use temporary housing such as hotels/motels, apartments (if available), man camps, and/or RV parks. Permanent housing needs would not be required for the construction of the Project; however, some housing would be required for the new permanent employees during the operation of the facilities (approximately 15-20 individuals).

Local Government Facilities and Services

The increase in population size would temporarily put a strain on local government facilities; however these facilities and services have been receiving government grants increase their size and quality in anticipation of increased local populations associated with oil and gas development activities.

Local Fiscal Conditions

Fiscally, the Project would temporarily increase the tax revenue of Dunn and McKenzie County, and the presence of temporary workers would likely positively affect the local economy since workers would be using local goods and services during construction and operation of the Project.

4.18.2 Mitigation – Social and Economic Conditions

No mitigation measures are proposed as the short and long-term socioeconomic effects of the project would either be negligible or positive.

4.19 Land Use, Range Management, and Recreation

4.19.1 Direct and Indirect Effects

Land Use

The Project would require land for the construction and operation of the pipeline facilities, including temporary and permanent ROW, additional temporary workspace areas, staging areas, access roads,

aboveground facilities, and construction yards. The typical construction ROW for pipeline construction would vary between 50 feet wide and 125 feet wide, and the Project's permanent ROW would vary between 20 feet wide and 50 feet wide depending on pipeline configuration and land ownership. Table 4.19.1-1, below, shows the typical construction rights-or-way and permanent rights-of-way associated with the Project.

TABLE 4.19.1-1

Bear Den Project
Proposed Construction and Permanent Right-of-Way Widths

Pipeline/Right-of-Way	Federal	North Dakota Department Trust Lands	Privately Owned	Wetlands and Waterbodies
Single Pipeline				
Construction right-of-way	50 feet	100 feet	100 feet	60 feet
Permanent right-of-way	20 feet	33 feet	50 feet	50 feet
Two Pipelines				
Construction right-of-way	80 feet	125 feet	125 feet	75 feet
Permanent right-of-way	50 feet	33 feet	50 feet	50 feet

The temporary construction areas that would be required to construct the Project (including the pipeline ROWs and aboveground facilities) could temporarily affect a total of approximately 467.6 acres of land. Following construction, CEBCS would maintain approximately 442.7 acres of permanent ROW. The pipeline route would cross approximately 48.1 miles (70 percent) of private land, 1.5 miles (2 percent) of federally managed BLM land, 12.4 miles (18 percent) of USFS land, and 6.5 miles (10 percent) of NDTL.

A summary of the temporary and permanent land requirements by landowner/management agency is provided in Table 4.19.1-2, below.

TABLE 4.19.1-2

Bear Den Project
Project Land Requirements by Landowner

Land Ownership	Land Requirements: Temporary Construction Area (acres)	Land Requirements: Permanent New Right-of-Way or New Facility Area (acres)	Total Disturbance (acres)
U.S. Forest Service	42.9	70.3	113.2
North Dakota Trust Lands	61.4	26.4	87.8
Bureau of Land Management	6.3	9.4	15.7
Private	357.1	336.6	693.7
TOTAL	**467.6**	**442.7**	**910.3**

CEBCS would utilize temporary extra workspace (outside the typical construction ROW) for construction, laydown, and parking during construction of the Project. ATWS would be needed at selected road and waterbody crossings; pipeline or underground utility crossings; aboveground structure locations; pipe laydown areas; and in special situations such as near existing powerlines or other aboveground features, and at the beginning and end of Project components to tie the proposed facilities together.

Road use by agency land managers, grazing permittees, recreationists, hunters, and oil and gas development could increase if development and recreational opportunities increase throughout the project area. Some roads are maintained through blading and grading, and water spraying for dust abatement is also common. Estimated disturbance is unknown and timing is ongoing. In general, CEBCS would access the construction ROW at locations where the ROW intersects with existing roads. Some roads

would require improvement prior to CEBCS utilizing them for construction equipment and vehicles, and additional new roads would be required. The temporary and permanent construction area acreages in Table 4.19.1-2 account for any temporary or permanent acreage associated with road improvements or construction.

Recreation

Direct and indirect effects on any recreational activity would be limited in scope or temporary in nature. During construction of the Project, disturbance of land and utilization of heavy construction equipment could deter wildlife from the area, limiting the opportunities for wildlife viewing and/or hunting. Due to the current infrastructure in the area associated with oil and gas development, the existing suitable environment for hiking, camping, and ORV and snowmobile use is fairly limited. The environment for these activities could become further limited during construction of the Project. Following construction, the disturbed area would be restored to near pre-construction conditions, and permanent effects to recreational opportunities in the area would be limited to those effects associated with the permanent aboveground facilities (see Visual Resources Section 4.16).

Range Management

Construction of the Project would have short-term impacts to suitable rangeland in the Project area, including temporary loss of forage, removal of native vegetation, and disturbance from general construction activities. Long-term impacts could include loss of grazing productivity as a result of noxious or invasive weed infestation or ineffective revegetation of the ROW. CEBCS would implement measures described in its CRMP to mitigate potential long-term impacts to suitable rangeland. It is expected that vegetation would return to pre-construction conditions within 2 to 5 years following construction. CEBCS does not anticipate that maintaining vegetation through rangeland areas would be necessary. Rangeland grazing activities would be allowed during and following construction, and any effects on rangeland management would be temporary and/or minimal.

4.19.2 Mitigation – Land Use, Range Management, and Recreation

CEBCS, in constructing and operating the proposed pipeline, would be required to adhere to construction practices outlined in CEBCS's construction mitigation plans; minimizing temporary and permanent impacts to land use. These measures would include practices to prevent soil erosion; to encourage water infiltration to provide for optimal plant growth and minimal surface runoff; to protect riparian areas; and to encourage diverse plant communities. Any range improvements such as fences, gates, cattle guards, and/or developed water sources located within the disturbed area or across access areas would be replaced or repaired following construction. Applying these construction practices would ensure that effects on current land uses, such as rangeland management and recreational activities, would be temporary in nature, and minor in scope. In addition CEBCS has developed a Transportation Plan (POD Appendix N) to ensure that effects to existing and planned transportation infrastructure and complies with BLM and USFS policies; as well as local, county, and state transportation regulations.

4.20 Access and Transportation

4.20.1 Direct and Indirect Effects

During construction, traffic would be expected to increase throughout the Project area because of the need to transport materials as well as construction workers to the ROW. This would increase traffic along the following highways 85 and 22, in addition to multiple county roads. Minor access roads to the ROW would also be affected during construction as materials are transported from staging areas to construction sites. As construction progresses, all routes used to get to the ROW would see temporary traffic increases for the duration of the construction period and would vary depending on the stage and location of the construction. The number of trucks needed during construction and operation would vary depending on the Project phase.

Traffic accidents may result from the increase in traffic, but the increase would be expected to be proportional to the greater amount of traffic on the road and would not be expected to be significant.

The increased amount of heavy trucks and machinery to and from the project area could potentially deteriorate road surfaces, particularly on unpaved roads.

After completion, the project is likely to have a measurable positive affect on traffic. Currently, 84 daily truck trips are needed to transport crude oil and water to and from the project. The project would result in decreasing daily truck trips by approximately 60% as the crude oil and produced water would now be transported by pipeline.

4.20.2 Mitigation

Road improvements such as grading, graveling, and bridge installations would be made as necessary, and all improved or heavily trafficked roads would be crossed using the bore method, minimizing traffic interruptions.

4.21 Public Safety

4.21.1 Direct and Indirect Effects

An accidental release of crude oil or produced water during pipeline operation could pose a threat to public safety by contaminating soil or water resources if not properly contained. Specific minimum quantities for mandatory reporting of spills have not been established in North Dakota. All spills which may potentially impact waters of the state, either surface water or groundwater, must be reported. This includes all substances, not just "hazardous materials." NDDH regulations require that a spill of any size which may cause pollution to Waters of the State be reported immediately; however, it is acknowledged that collecting information and assessing the situation may take time. Crude oil release from the pipeline is not anticipated.

Pipeline construction is not listed as a potential cause of wildfires; however, human carelessness is a leading cause of wildfires. CEBCS would notify the appropriate landowner or land managing agency of any fires during construction of the pipeline. CEBCS and its contractors would comply with all rules and regulations administered by the administrative office concerning the use, prevention, and suppression of fires on federal lands. An accident during pipeline construction or operation could also lead to a fire threat, but is not anticipated.

During construction, traffic would increase along the project route and the surrounding area which could affect public safety due to an increase in traffic related accidents. Increased traffic may also lead to an increase in airborne dust which has the potential to cause dust-related health issues. Once the pipeline is operating, traffic may decrease to levels below preconstruction levels because crude oil would be transferred by pipeline instead of tanker trucks.

4.21.2 Mitigation – Public Safety

The following mitigation measures are proposed to decrease the risk to public safety:

- Emergency response procedures would be established to handle any incident involving hazardous waste or a fire emergency. These procedures include immediate cleanup efforts and notification of spills to the appropriate agency officials, and initial fire suppression efforts should a fire occur. Emergency procedures are described in depth as part of the POD.
- Spills occurring during construction activities would be dealt with per the procedures in the SPCC Plan (POD Appendix L).
- Dust suppressants could be used in areas where dust is expected to be a problem.

- Buses would be used to transport construction workers to limit the number of cars on the road traveling to and from the construction site.

- Per federal regulations, CEBCS would have an established maintenance, inspection, and repair program that ensures the integrity of the pipeline during operations. CEBCS's pipeline maintenance program would be designed to maintain the safe and reliable operation of the pipeline. Data collected during maintenance would be fed back into the decision-making process for the development of the ongoing maintenance program.

- CEBCS also would mitigate third-party excavation risk by implementing comprehensive Public Awareness and Damage Prevention programs focused on education and awareness in accordance with 49 CFR Section 195.440 and API RP1162.

- Further, CEBCS would complete regular visual inspections (ground or aerial) of the ROW as per 49 CFR Section 195.

- In addition, the pipeline would be monitored 24 hours a day, 365 days a year using a sophisticated SCADA system. CEBCS would implement multiple leak detection methods and systems that are overlapping in nature and progress through a series of leak detection thresholds.

- Lastly, CEBCS would respond to any incidents. Spill containment measures and implementing actions would be identified and would help mitigate adverse effects resulting from an unanticipated spill of crude oil or produced water.

5.0 CUMULATIVE IMPACTS

5.1 Introduction

Cumulative effects are changes to the environment that result from the incremental impacts of a proposed project when considered together with the impacts of other past, present, and reasonably foreseeable future impacts, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time (40 CFR §1508.7). A cumulative impact is the additive effect of all projects in the geographic area.

The CEQ provides guidance on cumulative impact analysis in *Considering Cumulative Impacts under the National Environmental Policy Act* (CEQ, 1997). This guidance further identifies cumulative impacts as those environmental impacts resulting "from spatial and temporal crowding of environmental perturbations. The impacts of human activities will accumulate when a second perturbation occurs at a site before the ecosystem can fully rebound from the impacts of the first perturbation." Noting that environmental impacts result from a diversity of sources and processes, this guidance observes that "no universally accepted framework for cumulative impacts analysis exists," while acknowledging that certain general principles have gained acceptance. The CEQ provides guidance on the extent to which agencies of the federal government are required to analyze the environmental impacts of past actions when they describe the cumulative environmental effect of an action (CEQ, 2005). This guidance provides that a cumulative impacts analysis might encompass geographic boundaries beyond the immediate area of an action and a timeframe that includes past actions and foreseeable future actions. Thus, the CEQ guidelines observe, "[it] is not practical to analyze cumulative impacts to an action on the universe; the list of environmental impacts must focus on those that are truly meaningful" (CEQ, 2005).

This section presents a discussion of the potential cumulative effects associated with the Project and is presented in the following parts:

- the approach for the analysis, including the regulatory framework and the scope (temporal and spatial) of the analysis;
- a summary of the relevant past, present, and reasonably foreseeable future actions that could contribute to a cumulative effect when considered with the effects of the proposed Project; and
- the potential cumulative effects associated with the proposed Project when considered together with the relevant past, present, and reasonably foreseeable future actions.

5.2 Analysis Approach

5.2.1 Regulatory Framework

The regulatory framework for assessing cumulative effects for the proposed Project includes:

- The CEQ Regulations for Implementing the Procedural Provisions of the NEPA (40 CFR Part 1500-1508, 1978 as amended) (CEQ, 1986);
- The EPA's Procedures for Implementing the Requirements of the CEQ on the NEPA (40 CFR Part 6);
- The CEQ's Considering Cumulative Effects under the NEPA (January 1997) (CEQ, 1997);
- The EPA's Consideration of Cumulative Impacts in EPA Review of NEPA Documents, EPA 315-R-99-002 (May 1999);

- The BLM National Environmental Policy Handbook, H-1790-1 (2008); and
- The USFS NEPA Handbook, Forest Service Handbook 1909.15.

5.2.2 Scope of the Analysis

5.2.3 Level of Analysis

The cumulative impacts analysis focused on meaningful impacts from past, present, and reasonably foreseeable future actions. The level of analysis for each resource was commensurate with the intensity of the impacts identified in Chapter 4.

5.2.4 Temporal Extent of the Analysis

The temporal period in which impacts may overlap those of other projects varies. Short-term impacts may only occur during active construction (such as noise impacting wildlife and recreation) or may last 2 to 3 years past construction (such as impacts to agricultural land), while long-term impacts may last for decades or longer (such as the loss of mature forest habitat). Cumulative effects are not considered past the 30-year expected life of the ROW Grant for the Project on federal lands. Projects that occur or have remnant impacts within the period when the impacts of the proposed Project occur or remain could have a cumulative impact.

5.2.5 Spatial Extent of the Analysis

The spatial extent of the cumulative effects analysis includes Dunn and McKenzie Counties, North Dakota. However, the geographic scope used for analysis may vary for each cumulative effects issue and is described in the Affected Environment section for each resource.

5.2.6 Current Resource Conditions and Trends

On June 24, 2005, the CEQ issued an interpretive memorandum regarding the analysis of past actions for determining cumulative impacts that states “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.” Rather than attempt to quantify the effects of all past human actions by adding up all prior actions on an action-by-action basis, the analysis examined current environmental conditions as a proxy for the impacts of past actions. This was because the current condition more adequately captures all of the residual effects of past human actions as well as natural events, regardless of which particular action or event contributed those effects. The Affected Environment sections of Chapter 3 describe current resource conditions in the Project area. A brief summary is also provided in Section 5.4.

5.2.7 Potential Impacts of the Proposed Project that Might Contribute to Cumulative Impacts

The direct and indirect impacts of the proposed Project, presented in Chapter 4, were reviewed to identify impacts that are relevant to the cumulative impact analysis. Key factors considered include the current status and sensitivity of the resource and the intensity, duration, and spatial extent of the impacts for each activity. In general, long-term rather than short-term impacts and widespread rather than localized impacts were considered more likely to contribute to cumulative impacts. For example, for biological resources, population-level impacts were considered more likely to contribute to cumulative impacts than were impacts to individuals of a species. Impacts that were considered negligible in the direct and indirect effects analysis were not considered further in the cumulative impacts analysis.

5.2.8 Identification of Other Actions and Other Environmental Considerations That Affect Each Resource

A list of other reasonably foreseeable future actions was compiled for the Project area and surrounding areas based on the scoping process, communications with other agencies, state and local officials, and

other available information. These actions were reviewed to determine if they should be considered further in the cumulative impact analysis. Factors considered when identifying other actions to be included in the analysis include:

- whether the action is likely or probable (i.e., reasonably foreseeable), rather than merely possible or speculative;
- the timing and location of the other action in relationship to the proposed Project;
- the current conditions, trends, and vulnerability of resources affected by the other action; and
- the duration and intensity of the impacts of the other action, and whether the impacts have been truly meaningful, historically significant, or identified previously as a cumulative impact concern.

5.2.9 Analysis of Potential Cumulative Impacts

The combined impacts of all other actions, including the current aggregate impacts of past and present actions described in the baseline, were characterized and summarized. The incremental impacts of the proposed Project were then “added to” the combined impacts of all other actions to describe the cumulative impacts that would result if the Project was implemented. The detailed cumulative impact analysis considered additive, synergistic, and antagonistic impacts. A qualitative analysis was conducted in most cases based on the available information; a quantitative analysis was conducted when applicable.

5.3 Projects or Actions with Potential for Cumulative Effects

This section discusses the past, present, and reasonably foreseeable future actions within the spatial and temporal bounds identified above. Past actions include changes in general land use patterns since European settlement of the area. Present actions include ongoing practices and currently permitted actions. Reasonably foreseeable future actions include permitted actions expected to be started after the present time, as well as those in the permitting stages where permitting appears reasonably likely but has not yet occurred. Relatively recent cases reinforce the notion that, for the purposes of NEPA, a "future action" becomes "reasonably foreseeable" once it is "proposed," and that until then it is "speculative" and need not be accounted for in the cumulative impacts analysis (National Association of Environmental Practitioners, 2008).

To understand the contribution of past actions to the cumulative impacts of the proposed Project and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have impacted the environment and might contribute to cumulative impacts. However, in certain instances individual past projects have been identified because of the similarity in nature to the Project (e.g., other linear projects) or because the Project could impact those past actions and how those impacts cumulatively impact the environment.

This cumulative impacts analysis does not attempt to quantify the impacts of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. Current conditions have been impacted by innumerable actions over the last century and a half, and trying to isolate individual actions that continue to have residual impacts would be nearly impossible. Finally, as indicated above, the CEQ issued an interpretive memorandum on June 24, 2005, regarding analysis of past actions, which states, “agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.”

In addition, this cumulative impacts analysis is consistent with the USFS Regulations (36 CFR 220.4[f]) (July 24, 2008), which state, in part:

> CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives will add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making.

For these reasons, this section merely provides an overview of past actions and recognizes past impacts as expressed by current environmental conditions described in Chapter 3.

5.3.1 Overview of Past Actions

Prior to Euro-American settlement of the Northern Plains in the 19th Century, the land had been occupied for many centuries. Distinct Indian groups existed in North Dakota who were either nomadic and depended upon vast herds of American Bison for the necessities of life or they lived a relatively permanent lifestyle in earthlodges near the Missouri River relying on hunting and extensive gardens for prosperity (Remele, no date). North Dakota first entered the Federal Union in 1889 and its leaders prophesied a glorious future for the Northern Prairie State (Remele, No date). North Dakota has since seen boom-and-bust cycles in agriculture and energy industries.

The fur trade started in the 18th century and linked the Northern Plains to a world-wide economic and political system (Remele, No date). As a result, virtually all big game and fur bearing species were nearly extirpated from the state (Jensen, 2001). Bison were decimated from the landscape by 1884 (Jensen, 2001). Unrestricted subsistence and trophy hunting, combined with new diseases introduced by domestic sheep, brought about a rapid decline of wild bighorn sheep in the 1870s; by 1905 the last known bighorn ram in the state was shot in McKenzie County (Jensen, 2001). Reintroduction efforts and habitat improvement projects by the NDGFD and cooperating agencies have successfully rebounded many of the decimated species over the past century.

Significant immigration to the state commenced when the Northern Pacific Railway was built to the Missouri River in 1872 and new towns sprang up to serve the settlers (Remele, No date). Farming settlement developed during this period as well. Landscapes were gradually cleared and altered for agricultural purposes often displacing species like black-tailed prairie dogs, and prairie grouse populations (Jensen, 2001). The steep and rugged badlands terrain caused many settlers to think twice before plowing in this part of the state (Jensen, 2001).

Industrial development followed a second settlement boom in the 1920s and large lignite mines, brickworks and flour mills soon dotted the state (Remele, No date). An economic Depression started in the 1920s with the collapse of wartime prices for grain and continued into the 1930s which saw crop failures, dust storms, and weather extremes resulting in farm foreclosures (Remele, No date). Simultaneously, those farmers in a better financial position enlarged their holdings, and many farmers mechanized their operations. By the 1970s North Dakota's basic industry, agriculture, underwent major difficulties. By the end of the decade many famers found themselves unable to generate enough income to maintain their debts (Remele, No date). The number of farms declined steadily; however, the

development of agricultural equipment manufacturing and food processing became successful in the state (Remele, No date).

Between the 1930s and 1960s six large dams were constructed on the Missouri River (Jensen, 2001). This period saw an increase in major Federal projects that kept the construction economy booming. Projects such as flood control and diversion of the Missouri River for irrigation and industrial development and the creation of reservoirs for municipal water sources were implemented. The creation of these major projects forever changed the natural hydrograph and natural resources of the Missouri River and other affected waterbodies. Once found throughout the murky waters of the free-flowing Missouri River, pallid sturgeon are now confined to portions of the Missouri River and are federally listed as endangered. Clear water and deep reservoirs allowed a new assemblage of sight-feeding fish to thrive in the river system (Jensen, 2001). Today native walleye, and introduced species such as Chinook salmon, trout, and bass are popular game fish in the Missouri River (Jensen, 2001).

In 1951 oil was discovered near Tioga (Remele, No date) and by 1959 oil and gas was produced in Dunn County (Murphy, 2001). The discovery of oil coincided with the expanding use of coal to generate electricity resulting in the establishment of coal-fired power plants and oil refineries. The harvest of coal created huge strip mines which disturbed many in the state fearing it would destroy the land's suitability for agriculture (Remele, No date). Agricultural and environmental interest groups united to demand strong reclamation laws in the 1970s. No large-scale coal mining operations took place in Dunn County; however, coal was mined in the county from the face of outcrops and dumped into farm wagons (Murphy, 2001). Approximately 20 coal mines operated at some point in McKenzie County; however, most of the mines were small surface mines that operated between late 1920s and late 1950s (McKenzie County Background Report, 2012). The production of electricity required the placement of large powerlines across the state. Oil exploration and development caused population explosions in western cities such as Williston, Dickinson, and Watford City. However, world-wide oil prices declined in 1981 resulting in many oil workers moving on.

More recently the oil and gas industry has grown substantially in North Dakota and has more than quadrupled between the year 2001 and 2011 (North Dakota Department of Mineral Resources, 2012). McKenzie and Dunn counties were the 2011 top oil-producing counties of the state (North Dakota Petroleum Council, 2012). Oil and gas revenues for McKenzie County in 2011 were nearly 2.4 million for oil and gas production and 1.3 million in oil royalties (McKenzie County Background Report, 2012). In 2011, the oil industry paid $134 million in royalties and lease bonuses to the Lands and Minerals Trust Fund, which is now known as the Strategic Investment and Improvements Fund (North Dakota Petroleum Council, 2012). An additional $212 million of royalties, bonuses and oil extraction tax revenues were received by the Common Schools Trust Fund and other permanent trust funds (North Dakota Petroleum Council, 2012). Past crude oil projects in the two counties have resulting in over 4,700 acres of surface disturbing activities. Additional natural gas and electric transmission line projects in Dunn and McKenzie counties have resulted in an additional 6,200 acres of surface disturbance activities. From 2008 – 2012 there were 149 EAs and 6 Categorical Exclusion oil drilling projects filed in Dunn County. From 2008 – 2012 there were 225 EAs, 48 Categorical Exclusion, and two Documentation of Land Use Plan Conformance NEPA Adequacy oil drilling projects filed in McKenzie County.

A growing oil and gas industry along the prairies and badlands of North Dakota has resulted in a fragmented landscape with a mosaic of access roads being traveled by large vehicles, permanent oil well pads, temporary and permanent building structures and other anthropomorphic features. The recent boom in oil production has been a huge economic benefit to the state, but it has potential impacts to agriculture and tourism as well as cumulative impacts to water supplies and wildlife habitats (Dyke et al., 2011). The North Dakota Oil and Gas Industry together with USFS has reclaimed 819 well sites and 239 miles of road in the LMNG resulting in 3,538 acres returned to vegetation after oil and gas reserves were depleted (North Dakota Petroleum Council, 2012).

5.3.2 Present Actions

The following sections identify present actions in the vicinity of the proposed Project. Included actions are those located in the counties crossed by the Project. Actions are identified by type, starting with infrastructure; agricultural use; commercial, and industrial development; and other existing activities, projects, and developments.

Tables 5.3.2-1 and 5.3.2-2 list the current actions within the area that were included in the cumulative effects analysis; for this project the area considered was Dunn and McKenzie Counties, North Dakota (see Section 5.2.5). The tables also identify the resources with the potential for cumulative impacts from the Project when considered together with the activities associated with the listed projects.

Activities in or adjacent to the Project area that could contribute to cumulative effects impacting the natural resources of Dunn and McKenzie counties include livestock grazing, recreational activities (including but not limited to ORV traffic, hiking, and hunting), range improvement projects (including but not limited to fencing), agriculture, oil and gas development, powerline installation, and various land management/improvement activities (if poorly designed) like prescribed burns or noxious species control. Additional adverse impacts that could contribute to cumulative effects include fire suppression, forest encroachment, and disease from domestic sheep and goats (pose a risk to bighorn sheep specifically).

Infrastructure

Infrastructure considered includes transmission lines, pipelines, and road improvement projects. There are several infrastructure projects that have been recently approved that will occur within McKenzie County and are summarized in Table 5.3.2-1 below. Two crude oil pipelines will impact 1,839 surface acres, one natural gas pipeline will disturb 315 surface acres, and an electric transmission line will disturb 1,152 surface acres; however, only a portion of these surface disturbing activities will occur in McKenzie County. When the long term impacts of these infrastructure projects and the proposed Project are assessed together their long-term cumulative impacts could affect soil stability, vegetation composition and structure, migratory birds (powerline transmission), and visual resources.

Traveling in McKenzie County has changed dramatically in recent years because of the oil boom bringing increased traffic (McKenzie County Background Report, 2012). Truck traffic congests and tears apart roads as well as lengthens commutes. Traffic on Highway 85 increased 124 percent in 2011, compared to about 26 percent statewide (McKenzie County Background Report, 2012). Table 5.3.2-2 summarizes present and reasonably foreseeable future (until 2015) road maintenance projects in Dunn and McKenzie Counties. Of the 125.5 miles of road improvement proposed for Dunn and McKenzie Counties only one project in Table 5.3.2-2 is a major rehabilitation of Highway 85, the remainder are preventative maintenance like chip seal coat applications or intersection safety improvement projects.

TABLE 5.3.2-1

Bear Den Project
Present Energy Projects within Dunn and McKenzie Counties, North Dakota

Project Name	Company	Project Description	County	Surface Disturbance (acres) [a]	Potential Long-term Resources Affected[c]
PRESENT ACTIONS					
Crude Oil Pipelines					
BakkenLink Pipeline	BakkenLink Pipeline, LLC	This project would include the construction of a crude oil pipeline system consisting of approximately 132 miles (98 of which have been approved) of 8-inch-diameter and 12-inch diameter steel crude oil pipeline extending from multiple receipt points in Billings, McKenzie, Stark, and Williams Counties, North Dakota, to an interconnect with a proposed, future rail loading facility at Fryburg, North Dakota.	McKenzie	1,578	2,5,8,17
Belle Fourche Pipeline	True Companies	This project would include the construction of a crude oil pipeline (50,000 bpd capacity) from the Williston Basin of western North Dakota to the Powder River Basin in Wyoming.	McKenzie	261	2,5,8,17
		Crude Oil Pipeline Totals		**1,839**	
Natural Gas, NGL, and Other Pipelines					
Garden Creek Pipeline	Bear Paw Energy	This project would include a 64.2-mile-long, 10.75-inch-diameter (55.3 miles in North Dakota) NGL pipeline. The pipeline would operate at 400-1,300 psig and have a capacity of 65,000 bpd.	McKenzie	315	2,5,8,17
		Natural Gas, LNG, and Other Pipeline Totals		**315**	
Electric Transmission Lines					
Antelope Valley Station to Northwestern North Dakota 345-kV Transmission Line Project	Basin Electric Power Cooperative	This project would include the construction of approximately 190 miles of 345-kV electric transmission lines extending from the Antelope Valley Station near Beulah, North Dakota, to the existing Williston Substation near Williston, North Dakota, and onto the Neset Substation near Tioga, North Dakota.	McKenzie	1,152	2,8,12,14, 17
		Electric Transmission Line Totals		1,152	
		Present Action Totals		**2,991**	

[a] Refers to total project surface disturbance, not only disturbance within Dunn and McKenzie Counties.

[b] Estimated based on the assumption of a 50-foot permanent ROW.

[c] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Ground Water; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use, Range Management, and Recreation; 21. Access and Transportation; and 22. Public Safety.

TABLE 5.3.2-2

Bear Den Project
Present and Reasonably Foreseeable Future Transportation Projects within Dunn and McKenzie Counties, North Dakota

Work Type	Work Description	Highway	County	Location	Length (miles)	Potential Long-term Resources Affected[a]
PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS (2013-2015)						
Major Rehab	Aggregate Base, Grade, Hot Bit Pave	85	McKenzie	N Alexander Bypass	2.9	21, 22
Minor Rehab	Widening	200	McKenzie	E State Line E to Yellowstone Bridge	3	21, 22
Preventative Maintenance	Chip Seal Coat	22	Dunn	N 10 MI N Stark CO LN to Junction ND 200	16.6	21, 22
Preventative Maintenance	Chip Seal Coat	22	Dunn	N of Killdeer to Lost Bridge	19.9	21, 22
Preventative Maintenance	Chip Seal Coat	73	McKenzie	E Johnsons Corner E to Junction 22	11.3	21, 22
Preventative Maintenance	Chip Seal Coat	85	McKenzie	N 7.5 Mi N Grassy Butte to N End BR	6.3	21, 22
Preventative Maintenance	Chip Seal Coat	85	McKenzie	N Watford City W & N to Alexander	19.3	21, 22
Preventative Maintenance	Chip Seal Coat	85	McKenzie	N Alexander to Junction US 2	21.6	21, 22
Preventative Maintenance	Chip Seal Coat	22	McKenzie	N Junction ND 73 N to ND 23	14.9	21, 22
Preventative Maintenance	Chip Seal Coat	23	McKenzie	E Res Boundary E to 4 Bears Bridge	9.4	21, 22
Preventative Maintenance	Chip Seal Coat	85	McKenzie	N Alexander City Section	0.3	21, 22
Safety	Intersect Improvement	23	McKenzie	ND 23 (North of Keene)	0	21, 22
Safety	Intersect Improvement	16	McKenzie	ND 16 & McKenzie County Road 38	0	21, 22
	Present and Reasonably Foreseeable Future Transportation Projects Total				**125.5**	

[a] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Groundwater; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use, Range Management, and Recreation; 21. Access and Transportation; and 22 Public Safety.

Existing Patterns of Agricultural Use

Agricultural land is interspersed within and adjacent to the Project. Agriculture on irrigated lands can produce a variety of crops including spring, winter and durum wheat, sugar beets, corn for grain, alfalfa and hay. In the non-cultivated areas cattle grazing occurs on some lands.

Dunn County

The average size of farms in 2007 was 1,854 acres and there were 563 farms in the County (McKenzie County Background Report, 2012). Crop production of Dunn County when ranked out of 53 counties in the state in 2011 is the following: spring wheat (16), barley (24), corn for grain (36), all cattle (2), beef cows (1), milk cows (17), and sheep (24)(McKenzie County Background Report, 2012).

McKenzie County

The average size of farms in 2007 was 1,837 acres and there were 585 farms in McKenzie County. Crop production of McKenzie County when ranked out of 53 counties in 2011 are the following; spring wheat (34), Durum wheat (6), barley (14), all cattle (6), beef cattle (3)(McKenzie County Background Report, 2012). Approximately 200 ranchers depend on the use of McKenzie County lands for farming and ranching; however, the use of federal lands contributes in large part to the local economy (McKenzie County Background Report, 2012).

Existing Patterns of Residential, Commercial, and Industrial Developments

TABLE 5.3.2-3

Bear Den Project
Present Water Development Actions within Dunn and McKenzie Counties, North Dakota

Project Name	Project Description	Potential Long-term Resources Affecteda
State Water Management Plans		
Southwest Pipeline Project	Completion of Main Transmission Line for the Dunn Service area, construction of Dunn Service Area rural distr bution pipeline.	5, 8, 17, 19

[a] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Ground Water; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use, Range Management, and Recreation; 21. Access and Transportation; and 22. Public Safety.

Dunn County

Based on the 2010 Census, there are 3,536 people residing in Dunn County. Table 5.3.2-3 above summarizes the present and reasonably foreseeable future water development actions within Dunn County including completion of a main transmission line for the Dunn Service area.

McKenzie County

McKenzie County has a population of 6,360 (2010 Census) which represented a 10 percent increase from the 2000 Census. The economy in McKenzie County is based on natural resources and dependent on farming ranching and energy development. Population growth has led to McKenzie County landfill waste load increases from approximately 17 tons per day in 2009 to an average of 50 to 60 tons per day in 2011 (McKenzie County Background Report, 2012). The escalating waste has resulted in the North Dakota Department of Health requiring the landfill to meet more stringent environmental controls and costs (McKenzie County Background Report, 2012). The amount of people connecting to municipal water or to water wells is increasing due to the amount of oil activity in the area (McKenzie County Background Report, 2012). According to a report prepared for McKenzie County, water in the county is of poor quality, which they defined as containing high amounts of iron and sodium, tastes bad, kills grass and ruins plumbing fixtures (McKenzie County Background Report, 2012).

Most workers who have come to the area in the oilfield are single men or men who choose to live apart from their families. A housing shortage, which is a major reason more families don't move to the oil patch, has driven up rents and has forced people to sleep in campers, tents and vehicles. Constraints to the housing industry include the rising cost of construction, a cautious approach to residential planning taken by the county, and financing available from local governments and lenders (McKenzie County Background Report, 2012). None-the-less construction of housing has increased and about 120 new homes and about 150 apartments were constructed county-wide between 2010 and 2011 (McKenzie County Background Report, 2012). McKenzie County Economic Development estimates 600 new businesses have been established in recent years, the majority of which are oil related (McKenzie County

Background Report, 2012). In addition, motels, restaurants, mechanic shops, and service facilities are expanding (McKenzie County Background Report, 2012).

The county's healthcare system has been impacted by the oil industry, including difficulty retaining and recruiting staff as well as finding housing for workers (McKenzie County Background Report, 2012). Emergency room visits have escalated recently. In October 2011 there were double the monthly average for 2010 (McKenzie County Background Report, 2012). The increased volume of clinic visits in the county is seen as positive, but staff shortages have left the hospitals unable to accommodate the increase (McKenzie County Background Report, 2012).

5.3.3 Reasonably Foreseeable Actions

Available planning documents were consulted for the federal, state, and local jurisdictions crossed by the Project, as well as listed activities that are known to the public through formal announcement and those projects that have applied for a permit from a federal, state, or local agency. CEQ (1997) highlights the difficulty in obtaining information regarding reasonably foreseeable future actions on private lands:

> Effective cumulative effects analysis requires close coordination among agencies to ensure that even all present actions, much less past and future actions, are considered. The first step in identifying future actions is to investigate the plans of the proponent agency and other agencies in the area… When identifying future actions to include in the cumulative effects analysis, reasonably foreseeable actions by private organizations or individuals are usually more difficult to identify than those of federal or other governmental entities. In many cases, local government planning agencies can provide useful information on the likely future development of the region, such as master plans.

Tables 5.3.3-1 through 5.3.3-3 list the reasonably foreseeable future actions within the area that were included in the cumulative effects analysis; for this project the area considered was Dunn and McKenzie Counties, North Dakota (see Section 5.2.5). The tables also identify the resources with the potential for cumulative impacts from the Project when considered together with the activities associated with the listed projects.

General activities that could contribute to reasonably foreseeable future actions could include a variety of disturbances. An increasing human population in western North Dakota, due in large part to a growing oil and gas industry, would likely increase disturbance to the natural resources of Dunn and McKenzie counties through home construction, increased vehicular traffic, increased recreational activities, increased establishment of 'hobby ranches' for recreational purposes, and increased hunting pressure on western big game species and/or prairie dogs. Although the Project is currently designed and scoped to service the transportation needs of a single production company, it is possible that connections with additional or third-party wells could also be pursued in the future, which could result in the need for expanded or additional facility components.

Cumulative effects cannot be meaningfully analyzed for some types of potential actions, including the following:

- **Maintenance and Improvement of Existing Roads on Federal Lands.** Federal lands in or near the Project area are covered by multiple reciprocal road use and right-of-way agreements enacted between the USFS, and/or adjoining landowners. While requests are frequently received under the terms of these agreements to construct new roads or to renovate, improve, or use existing roads, there is no practical means to forecast the timing and location of such requests.

- **Maintenance and Improvement of Existing Roads on Non-federal Lands.** McKenzie County has provided a 2013 Impact Budget, which is directly related to the exponential growth of the oil boom and nearly 86 percent of the budget will be spent on roads and 3 percent on dust control (McKenzie County Background Report, 2012).

- **Creation of Rural Water System in McKenzie and Dunn Counties.** Table 5.3.3-1 below summarizes the reasonably foreseeable future water development actions within McKenzie County including collaboration with other water resource districts to develop a regional water supply system. The water supply system would deliver Missouri River water to areas throughout the northwest including oil producing regions. The first stage of the project has been partially funded and includes installing piping under the Missouri River and a fill station (McKenzie County Background Report, 2012). McKenzie County is also looking to build a rural water system in and around Watford City (McKenzie County Background Report, 2012).

- **Wildfire.** Wildfires can occur in portions of the Project area but it is impossible to predict when and where they will occur.

TABLE 5.3.3-1

Bear Den Project
Reasonably Foreseeable Future Water Development Actions within Dunn and McKenzie Counties, North Dakota

Project Name	Project Description	Potential Long-term Resources Affected[a]
State Water Management Plans		
Western Area Water Supply	Collaboration with McKenzie Water Resource District to develop a regional water supply system that would deliver Missouri River water to areas throughout the northwest, oil producing regions of North Dakota.	4, 5, 6, 8, 10, 13, 17, 19

[a] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Ground Water; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use, Range Management, and Recreation; 21. Access and Transportation; and 22. Public Safety.

Other programs are assumed to continue at existing levels, including the following:

- **Grassland Restoration Projects.** Restoration of specific high priority grassland systems and/or range improvement projects that have been identified through the USFS LRMP process as well as other high priority restoration projects on NDTL land are assumed to continue.

- **Road Maintenance.** Road maintenance operations are assumed to continue at the current rate. Road maintenance activities can be directly related to oil and gas industry activities, and any increasing oil and gas operations could result in more road maintenance in that geographical area. Table 5.3.2-2 summarizes current and reasonably foreseeable road maintenance projects. The proposed Project would result in reduced traffic on roads because of the installation of a pipeline gathering system.

- **Invasive Plant Control.** The USFS, BLM, NDGFD, and other private and public entities have active invasive plant programs during the spring and summer months. Invasive plants, including noxious weeds, are assumed to continue to be treated within the Project area at the current rate. Table 5.3.3-1 summarizes present and reasonably foreseeable future actions as they relate to noxious and invasive weed control in Dunn and McKenzie County. The DPG Noxious Weed Management Project outlines methods to protect rare and sensitive species when they occur in close proximity to management activities.

TABLE 5.3.3-2

Bear Den Project
Present and Reasonably Foreseeable Future Invasive Weed Actions within Dunn and McKenzie Counties, North Dakota

Action	Agency Involved	Description	Potential Long-term Resources Affected[a]
PRESENT AND REASONABLY FORESEEABLE FUTURE ACTIONS			
Dakota Prairie Grasslands Noxious Weed Management Project Final Environmental Impact Statement (FEIS), March 2007	USDA Forest Service	Noxious weed treatment strategy would treat all known acres of noxious weeds (57,234) on the Dakota Prairie Grasslands over the next 4-9 years.	5, 8, 9, 11, 20
North Dakota Department of Agriculture 2013 Noxious Weed List Survey	North Dakota Department of Agriculture	Currently underway	8, 9

[a] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Ground Water; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use, Range Management and Recreation; 21. Access and Transportation; and 22. Public Safety.

Reasonably foreseeable future energy project within Dunn and McKenzie Counties have been summarized in Table 5.3.3-3 below. There is an anticipated 706 acres of surface impacts in McKenzie County related to future crude oil and natural NGL pipelines; however, only a portion of the surface disturbances will occur in McKenzie County. There were 1,179 producing wells in McKenzie County in 2011 with another 191 wells capable of producing (McKenzie Background Report, 2012). That accounts for 19 percent of all producing well in North Dakota (McKenzie County Background Report, 2012). In Dunn County, 241 wells were active in 2010 with a projected potential for the development of 7,200 wells in the next 15 years (North Dakota Department of Mineral Resources, 2012). In 2012, McKenzie County had 370 existing wells with a 15-year projected total of 7,800 (McKenzie County Energy Impact Report, 2012). Although the Project is currently designed and scoped to service the transportation needs of a single production company, it is possible that connections with additional or third-party wells could also be pursued in the future, which could result in the need for expanded or additional facility components. Long-term cumulative effects associated with future oil and gas development when added to the proposed Project could result in noise increases, soil impacts, changes in vegetation structure and composition, and visual resource impacts.

TABLE 5.3.3-3

Bear Den Project
Reasonably Foreseeable Future Energy Projects within Dunn and McKenzie Counties, North Dakota

Project Name	Company	Project Description	County	Surface Disturbance (acres) [a]	Potential Long-term Resources Affected
Crude Oil Pipelines					
Hiland Crude, LLC Hwy 23 Project	Hiland Crude, LLC	56 miles of 4-6-inch-diameter crude oil pipeline in western North Dakota.	McKenzie	339 [a]	2, 5, 17
BakkenLink AMS to Beaver Lodge Project	BakkenLink Pipeline, LLC	Approximately 35 miles of 12-inch-diameter crude oil pipeline and an Oil receipt facility near Keene, North Dakota.	McKenzie	212 [a]	
Natural Gas, LNG, and Other Pipelines					
Hess Hawkeye Pipeline System	Hess Corporation	Construction and operation of a 25.5-mile long pipeline system consisting of 8- and 12-inch-diameter NGL, HP Gas, and HP Oil pipelines to transport oil, gas, and NGL through various existing connection points before terminating at the Hess Ramberg Truck Facility or the Silurian Compressor Station.	McKenzie	155 [a]	2, 5, 17
		Crude Oil Pipeline Totals		**551**	
		Natural Gas, NGL, and Other Pipeline Totals		**155**	
		Reasonably Foreseeable Future Action Totals		**706**	
Location/Type				**No.**	
PRESENT AND REASONABLY FORESEEABLE FUTURE OIL DRILL ACTIONS (2013)[b]					
Dunn County					
Environmental Assessment				19	
Categorical Exclusion				3	
Documentation of Land Use Plan Conformance and NEPA Adequacy				0	
McKenzie County					
Environmental Assessment				41	
Categorical Exclusion				5	
Documentation of Land Use Plan Conformance and NEPA Adequacy				1	
		Present and Reasonably Foreseeable Future Oil Drill Projects Total		**69**	

[a] Resources Affected: 1. Air; 2. Noise; 3. Geology and Minerals; 4. Hydrology; 5. Soils; 6. Surface and Ground Water; 7. Wetlands and Riparian Zones; 8. Vegetation; 9. Noxious Weeds; 10. Special Status Animals; 11. Special Status Plants; 12. Migratory Birds; 13. Aquatic Wildlife; 14. Terrestrial Wildlife; 15. Cultural Resources; 16. Paleontological; 17. Visual Resources; 18. Hazardous or Solid Wastes; 19. Social and Economic Conditions; 20. Land Use Range Management and Recreation; 21. Access and Transportation; and 22. Public Safety.

[b] Present and Reasonably foreseeable future oil drill actions do not include Application for Permits to Drill where NEPA has not been initiated

5.4 Cumulative Impact Analysis

The oil and gas industry has grown substantially in North Dakota and has more than quadrupled between the years 2001 and 2011 (North Dakota Department of Mineral Resources, 2012). An increasing human population in western North Dakota, due in large part to a growing oil and gas industry would likely increase disturbance to the various natural and cultural resources of the state through increased home and business construction, increased vehicular and railway traffic, increased recreational activities, increased establishment of 'hobby ranches' for recreational purposes, and increased hunting pressure on western big game species and/or prairie dogs. The recent population increase in Dunn and McKenzie Counties has increased landfill waste loads, has created home shortages, and has taxed the local healthcare system. These various actions associated with a growing oil and gas industry can lead to a variety of impacts to the natural and cultural resources if not properly planned, mitigated for, or controlled for.

A growing oil and gas industry along the prairies and badlands of North Dakota has resulted in a fragmented landscape with a mosaic of access roads being traveled by large vehicles, permanent oil well pads, temporary and permanent building structures and other anthropomorphic features. The increase in the number of oil wells has resulted in the need for establishing crude oil gathering systems. Pipelines are one of the safest forms of crude oil transportation and provide a cost-effective and safe mode of transportation for oil on land. Pipelines can also reduce the number of oil tanker trucks accessing oil well pads therefore decreasing impacts on air quality and wildlife populations. In May 2013, lawmakers in North Dakota passed legislation to provide more than 1.1 billion dollars in state aid to help western North Dakota communities deal with expanding energy development in the region. This aid will be funded by oil and gas production taxes for such things as road repair and other infrastructure improvements, law enforcement, emergency medical services, dust control, schools, hospitals, and nursing homes.

5.4.1 Air Quality

Construction of the Project, as well as the past projects and reasonably foreseeable future, could involve the use of heavy equipment that could produce dust from soil disruption and air contaminants from combustion emissions. The majority of air quality impacts from construction activities would be mitigated by the remote location of each project and the fact that each project would be constructed over different and distinct periods of time.

A growing oil and gas industry along the prairies and badlands of North Dakota has resulted in increases to local and regional airshed emissions. However, cumulative increases in operational air pollutant emissions are not anticipated to be significant due to the levels of permitted emissions from the Project. In addition, each project identified in Sections 5.3.2 and 5.3.3 could be subject to state and local permitting requirements where potential interactions with nearby emission sources would be subject to applicable laws and standards; therefore, significant cumulative impacts are not expected or would be appropriately mitigated.

Assuming applicable environmental protection measures are effectively implemented, and given the short duration and localized nature of the construction activities, the cumulative impacts of the Proposed Action on air quality are projected to be minimal and short-term in nature. Long-term cumulative impacts to air quality are not anticipated. The reduction of the number of oil tanker miles driven to service well pads operating in the Project area would result in a net decrease in air quality impacts by removing up to 84 large diesel powered trucks per day from the road. With implementation of the proposed mitigation measures, and adherence of future projects to state and local permitting requirements, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to air quality

5.4.2 Noise

Cumulative effects due to the background ambient noise levels occurring as a result of noise generated during operations would be localized to the immediate vicinity of the receipt facilities. Noise associated with the use of generators to provide temporary power to the pipeline system is assumed to be minimal and sporadic. No sensitive noise receptors (e.g., residences) are known to exist within 3,800 feet of the transfer/storage facility. Tanker truck activities would occur at the storage/transfer facility and maintenance vehicle traffic would occur throughout the Project area; however, overall, authorization of the Project would decrease total vehicle traffic, thus decreasing ambient noise levels in the project area by eliminating the daily truck visits to the 31 associated well facilities. Noise generated by construction or operation of the Project would meet acceptable levels and would be short-term in duration therefore, ,when added to past and present actions and reasonably foreseeable future actions, the Project would not be expected to significantly contribute to cumulative impacts to noise in Dunn and McKenzie Counties.

5.4.3 Geology and Minerals

Potential impacts to the stability of sub-surface geology and presence of sub-surface minerals could occur as a result of substantial increases in development due in part to the recent oil boom in western North Dakota. A growing oil and gas industry along the prairies and badlands of North Dakota has resulted in record oil and gas production levels and is expected to continue for the foreseeable future. In 2011, Dunn County was producing 21 million barrels of oil annually (North Dakota Department of Mineral Resources, 2012). In McKenzie County, 2.7 million barrels of oil were being produced monthly, which could potentially yield up to 60 million barrels annually (McKenzie County Energy Impact Report, 2012). In Dunn County, 241 wells were active in 2010 with a projected potential for the development of 7,200 wells in the next 15 years (North Dakota Department of Mineral Resources, 2012). In 2012, McKenzie County had 370 existing wells with a 15-year projected total of 7,800 (McKenzie County Energy Impact Report, 2012).

Geology

Incremental effects of the Project on geology are difficult to quantify because of varying site conditions. The Project would not increase oil and gas extraction activities as it is proposed as a transportation facility. The Project would not affect sub-surficial geology because buried depth of the facilities is not expected to exceed five feet. The Project would not cross any unique or protected surficial features. The Project does not require blasting activities. Moreover, the Project would not cross active or abandoned mines, oil or gas wells, or seismically active areas. The Project would cross several areas which are prone to landslide or slumping. This could contribute to the overall surface stability of the area. However, given appropriate design and mitigative measures, geologic hazards would not be expected to significantly contribute to cumulative impacts in the Project area.

Minerals

Since there are no anticipated impacts to the access of oil and gas, lignite, or uranium resources during construction or operation, there would be no contribution to cumulative impacts associated with those mineral resources. The Project's demand for aggregate would be small compared to the overall aggregate production in North Dakota which was 1.62 million short tons in 2010 (Willett and Bolen, 2011). Aggregate demand for the Project would be minimal during operation and have no long-term effects.

5.4.4 Soil Resources

The Project would require temporary disturbance of approximately 473 acres of land in order to complete construction. The Project would require the permanent development of approximately 444 acres of land to operate the facilities. Of this total acreage, the Project would cross soils which are prone to water erosion (52 acres), areas with soft bedrock (37 acres) and soils that are difficult to re-vegetate (46 acres).

To a lesser extent, the Project would cross some hydric, compaction prone, stony, draughty, and wind erosion prone soils.

The Project has developed project-specific reclamation, revegetation and erosion control construction and stabilization techniques. In order to achieve minimal incremental adverse cumulative impacts to the project area, these methods would be implemented to stabilize and revegetate the construction ROW. Only aboveground facility locations would not be revegetated. All areas would be reclaimed for long-term stabilization which would prevent erosion, slumping, or liquefaction of soils. The reclaimed construction ROW would be suitable for cattle grazing once revegetation has been achieved.

Past activities in Dunn and McKenzie Counties coupled with the currently proposed Project could result in cumulative effects to soils because of the overall level of disturbance associated with the construction of existing adjacent pipelines and/or oil and gas drilling activities, as well as construction of associated roads and facilities. Current and future activities within and adjacent to the project area that could contribute to cumulative effects include livestock grazing, range improvements, recreational activities such as ORV use, wind energy tower installation, additional oil and gas development, powerline installation, and vegetation treatments used for growth promotion or weed eradication. With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to soil resources.

5.4.5 Surface and Ground Water

Activities that could result in substantial surficial development, disturbance, or the creation of impervious surfaces (i.e., parking lots and roads) could potentially decrease surface and ground water quality through increased run-off and pollution. Degradation of surface water quality and/or groundwater quality could occur through the effects of erosion and sedimentation, and/or through the accidental release of hazardous materials, particularly if a storm event occurs during construction activities. No new impervious surfaces are planned for the Bear Den Project other than portions of the 40-acre storage/transfer facility. There are no operational impacts anticipated from erosion or sedimentation to surface and ground water sources because no ground disturbing activities are planned. Other projects in the area would also have the potential to result in water quality impacts associated with erosion and sedimentation and/or the release of hazardous materials. Quantitative information on impacts to water resources is not available at this time for many of these projects.

CEBCS has incorporated a variety of mitigation measures including a SWPPP (POD Appendix G) and an SPCC Plan (POD Appendix L) to reduce and avoid adverse impacts to surface and ground water along the Project area as outlined in Section 4.5. In addition, the Little Missouri River and most other streams would be crossed using the HDD method. Impacts to water quality would not be anticipated as a result of Project implementation; therefore, cumulative impacts would not be anticipated to surface or groundwater within the cumulative effects study area that includes the two-county area of McKenzie and Dunn Counties. During operation, a pipeline spill or rupture could result in short-term water quality impacts to surficial or shallow groundwater. However, the Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity and of the pipeline system, a remote leak detection and monitoring system would be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be identified immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance.

With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to surface and ground water resources.

5.4.6 Wetlands and Riparian Zones

The various past and foreseeable future projects in Dunn and McKenzie Counties could result in alterations to wetlands and riparian zones and their function; however, quantitative impact information on wetlands is not available at this time for these projects. Activities that could result in substantial surficial development, disturbance, or the creation of impervious surfaces (i.e., parking lots and roads) could potentially increase run-off and pollution to nearby waterbodies and riparian zones. Increased run-off causing sedimentation in wetlands and riparian zones combined with increased wetland fill activities related to increased construction and development activity could eventually lead to a loss of wetland function or wetland acres. Overall, short term impacts to wetlands and riparian zones such as soil or sediment disturbance would dissipate over a period of weeks, while long term impacts, such as regrowth of vegetation within temporary construction rights-of-way could persist for months or years.

Construction of the Project would result in approximately 4.7 acres of temporary disturbance to wetlands. The Project would be subject to review and approval by the appropriate permitting agencies, including the COE and applicability of coverage under the NWP 12 under Section 404 of the Clean Water Act. In addition, the COE has previously accounted for cumulative wetland impacts authorized under the Nationwide Permit program under which Project-related impacts are anticipated to be authorized. CEBCS would implement restoration as outlined in the CRMP (POD Appendix E) and monitor restoration success such that long-term loss of wetland vegetation and function is not anticipated from construction of the Project. Further, discharges to wetlands and other riparian zones associated with construction and operation would require review and approval under the North Dakota Department of Health's stormwater discharge programs. Therefore, cumulative impacts to wetlands and riparian zones would be avoided or minimized and limited to temporary surface disturbance within the wetlands traversed. Environmental protection measures and mitigation measures (see Section 4.6.2) such as using the HDD method for crossing many wetlands and steep sideslopes to minimize sedimentation, and the SWPPP (POD Appendix F) would be implemented to avoid and minimize impacts to wetlands as part of the proposed Project.

With implementation of the proposed mitigation measures and the review and approval by appropriate permitting agencies, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to wetland and riparian resources.

5.4.7 Vegetation

The cumulative effects study area focuses primarily on the two counties (McKenzie and Dunn) where the proposed Project is located, which is comprised of approximately 3,160,000 acres of land. As presented in Table 4.7.1-1 of the Vegetation section, a total of approximately 910 acres would be disturbed by the construction of the Project. This would be less than 1/1000th of one percent of the entire cumulative impacts study area. Most of the projects identified in Section 5.3 above would also result in temporary and permanent losses of vegetation communities through grading and clearing activities to construct roads, utility infrastructure, and commercial, industrial, and residential developments. The cumulative impacts of these projects would be most significant if the projects were constructed at or near the same time and within close proximity of one another. Quantitative impact information on vegetation is not available at this time for many of these projects. Other activities such as livestock grazing, agriculture, and recreational activities can also contribute to the combined cumulative impacts to vegetation in Dunn and McKenzie Counties.

Construction, operation, and decommissioning activities associated with the proposed Project would result in temporary and permanent losses of native vegetation. Despite measures to protect vegetation and remediate losses, construction of the proposed Project would cause both temporary (during construction from vegetation clearing) and permanent (replacement of vegetation with project features such as the 40 acre storage/transfer facility and permanent access roads) impacts to vegetation. The Project will result in approximately 143 acres of disturbance in agricultural land or previously disturbed areas, including the permanent impacts associated with the 40 acre storage/transfer facility. Impacts from

Project operation would require maintenance of a permanent easement of approximately 454 acres; however, the only anticipated maintenance includes control of woody vegetation which could compromise the structural integrity of the pipeline.

To reduce temporary and long term disturbances to vegetation and to reduce habitat fragmentation in the Project area several BMPs and project design measures would be implemented. Approximately 58% of the Project has been collocated with existing utility rights-of-way and other disturbed areas. Sensitive habitats such as riparian systems, wetlands, native prairie, and talus slopes have been avoided to the extent practicable. Preconstruction biological surveys identified special status plant species along the proposed route to further identify sensitive areas to avoid. Implementing environmental BMPs in the CRMP (POD Appendix E) and SWPPP (POD Appendix G) and protection measures such as proper handling of topsoil and spoil would reduce temporary and long term disturbances to vegetation. Noxious invasive weed control measures as outlined in CEBCS' Weed Management Plan (POD Appendix K) combined with reclamation techniques using a variety of native species followed by five years of monitoring for success are outlined in CEBCS' CRMP (POD Appendix E) and will further reduce and minimize cumulative impacts to vegetation in the Project area..

Overall there will be minimal loss of vegetation associated with the proposed Project in relation to the total amount of land area within the cumulative effects study area. With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to vegetation resources.

5.4.8 Noxious Weeds and Invasive Species

Construction activities in Dunn and McKenzie Counties in relation to a booming oil industry may result in soil disturbance activities that can increase the introduction, spread, and proliferation of noxious weeds and invasive plant species in an area. Noxious weeds can ultimately impact ecosystem diversity and health and without treatment, weeds can increase about 14 percent per year under natural conditions (USFS, 2007). The USFS and the North Dakota Department of Agriculture have formulated weed management plans with associated BMPs to further protect local resources. McKenzie and Dunn Counties have active weed boards to address local infestations.

Of the 914 surface acres (see Table 4.7.1-1) impacted by the proposed Project a total of 200 acres of weed infestations or populations were identified during preconstruction surveys. The cumulative impacts study areas includes two counties (McKenzie and Dunn), which include approximately 3,160,000 acres of land. Past energy projects have resulted in approximately 10,900 acres of surface disturbance activities in the cumulative impacts study areas. The surface disturbance activities of past, current and foreseeable future energy projects in McKenzie and Dunn Counties accounts for less than 1/100th of one percent of the entire cumulative impacts study area. Additional cumulative impacts that could affect noxious weeds in McKenzie and Dunn Counties include livestock grazing; wildlife and human activities could act as vectors for seeds of noxious species to new areas; range improvement projects (i.e., installation of fencing); agricultural practices' and fire suppression.

To reduce temporary and long term disturbances to noxious weeds and invasive species in the Project area several BMPs and project design measures would be implemented. Approximately 58% of the Project has been collocated with existing utility rights-of-way and other disturbed areas. Preconstruction biological surveys identified infestations of noxious weeds along the proposed Project route to help identify areas for management and control as well as areas that will require additional protection during construction. Implementing environmental BMPs outlined in the Weed Management Plan (POD Appendix K) and CRMP (POD Appendix E) such as requiring construction equipment to arrive clean and weed free, the use of certified weed free erosion control materials and seed mixes, the establishment of air compressor (wash) stations to reduce the transfer of noxious weeds within the Project area would reduce the chance of creating new noxious weed infestations and/or exacerbate current infestations. Reclamation techniques, which include the redistribution of topsoil along the Project and revegetating disturbed areas with a variety of native species followed by five years of monitoring for success, are

outlined in CEBCS' CRMP (POD Appendix E) as well as in Section 4.8 and will further reduce and minimize cumulative impacts to noxious species in the Project area.

With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to noxious weeds and invasive species.

5.4.9 Special Status Animals Species

Rare species are generally habitat specialists, requiring specific habitat types and associations for their survival and productivity. When their habitats are fragmented and altered by oil and gas development or other development related projects their populations can be imperiled if appropriate mitigation measures are not incorporated into project design and implementation. For example, bighorn sheep were first reintroduced over 50 years ago onto LMNG land (Magpie Creek area) 27 miles southwest of the Project (Sayre, 1996). Since their reintroduction the oil and gas industry has grown substantially in and around the reintroduction site and this has caused a steep population decline (Dyke et al., 2011). Lambing areas are the most critical habitats used by bighorn sheep and, because such areas are very limited in North Dakota, are the most significantly impacted by human-caused disturbance like oil and gas development (Dyke et al., 2011).

Current and future activities in the Project area that could contribute to cumulative effects impacting the habitat type and populations of ESA-listed and USFS/BLM Sensitive Species include livestock grazing, recreational activities (including but not limited to ORV traffic, hiking, and hunting), range improvement projects (including but not limited to fencing), agriculture, oil and gas development, powerline installation, and various land management/improvement activities (if poorly designed) like prescribed burns or noxious species control. Additional adverse impacts include fire suppression, forest encroachment, and disease from domestic sheep and goats (pose a risk to bighorn sheep specifically). Although the installation of crude oil gathering pipelines requires linear development across a potentially wide area, the pipelines ultimately help to reduce the amount of daily truck traffic accessing active oil well pads and disposal wells for collection and disposal. This in turn could decrease daily disturbance events or roadside mortalities of special status wildlife species.

Fourteen threatened, endangered, or USFS/BLM special status animal species would be potentially impacted by construction activities associated with the proposed Project. The proposed Project would not be likely to adversely affect any federally listed or special status species with the implementation of the mitigation measures as described in Section 4.9. Some of those measures include to avoid and minimize impacts to those species such as reclaiming disturbed areas with native seed mixes and monitoring reclaimed areas for five years, avoiding sensitive habitats to the extent practicable, and implementing various BMPs for resource protection. If other reasonably foreseeable future projects were to impact the same habitats as the proposed Project with minimal mitigation, cumulative impacts to these listed species could occur. The protection of threatened, endangered, and other special status species is considered as part of federal and state permitting processes, therefore, impacts to such species would likely be reduced or eliminated through conservation and mitigation measures identified during those relevant permitting processes.

With implementation of the proposed mitigation measures and avoidance of known populations of special status animal species, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to special status animal species.

5.4.10 Special Status Plant Species

Special status plant species are generally habitat specialists, requiring specific habitat types and associations for their survival and productivity. Current and future activities in the cumulative effects area (McKenzie and Dunn Counties) that could contribute to cumulative effects potentially impacting habitat and populations of special status plant species include livestock grazing, recreational activities (including

but not limited to ORV traffic and hiking), noxious weed treatments, range improvement projects (including but not limited to fencing), agriculture, oil and gas development, and powerline installation projects. Additional adverse impacts to special status plant species could potentially include fire suppression and forest encroachment.

Ten USFS sensitive species and one watch list plant species would not be likely be adversely affected by construction activities associated with the proposed Project. Mitigation measures to avoid and minimize impacts to those species would be implemented. These various measures include protecting or avoiding (i.e., using HDD technology) the USFS Sensitive Species that occur within the temporary ROW and/or protecting populations with fencing buffers and signage. Additional mitigation measures include reclaiming disturbed areas with native seed mixes and monitoring reclaimed areas for five years, avoiding sensitive habitats to the extent practicable, and implementing various BMPs for resource protection, as described in Section 4.10. By implementing the proper mitigation measures the cumulative impacts of the proposed Project to special status plant species in addition to those of past and reasonably foreseeable future projects should be minimal. If other reasonably foreseeable future projects were to impact the same habitats as the proposed Project, cumulative impacts to these listed species could occur. The protection of threatened, endangered, and other special status species is considered as part of federal and state permitting processes, therefore, impacts to such species would likely be reduced or eliminated through conservation and mitigation measures identified during those relevant permitting processes.

With implementation of the proposed mitigation measures and avoidance of known population of USFS Sensitive Species, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to special status plant species.

5.4.11 Migratory Birds

Cumulative impacts to migratory birds could include temporary habitat loss, habitat fragmentation, animal displacement, and direct mortalities. Permanent surface occupancy at the 40-acre storage/transfer facility incrementally would add to wildlife habitat loss, fragmentation, and displacement and/or mortality; however, the 40-acre storage/transfer facility would be located in previously disturbed habitat (primarily agricultural land) that is considered marginal for many migratory species and the facility would be located in close association with other oil and gas facilities along a busy road where access is relatively fast and easy. In areas where development has occurred, habitat fragmentation may have resulted in the disruption of seasonal breeding or wintering patterns and/or migration routes. Historic, current, and future developments could result in the reduction of carrying capacities, as characterized by the amount of available coverage, forage, and breeding habitats for migratory birds. For migratory birds, the cumulative effects study areas includes two counties (McKenzie and Dunn), which include approximately 3,160,000 acres of land. As described in Table 4.7.1-1, a total of approximately 914 acres would be disturbed by the Project. Impacts from Project construction/operation would include the permanent disturbance of approximately 454 acres of wildlife habitat, which would be less than 1/1000th of one percent of the entire cumulative impacts study area.

Other activities, such as livestock grazing, agriculture, and recreational activities, could also contribute to cumulative impacts to migratory birds. Bird species could be susceptible to these cumulative impacts, since encroaching human activities in the cumulative effects study area could result in habitat loss and fragmentation and bird displacement in areas that could be at their relative carrying capacity for these resident species. Many of the local migratory birds that occur in the Project and surrounding areas would likely continue to occupy their respective ranges and breed successfully, although population numbers could decrease relative to the amount of cumulative habitat loss and disturbance from incremental development.

Environmental protection measures and mitigation measures would be implemented to minimize the potential for significant project-related impacts to migratory birds as part of the proposed Project. These measures include restoration plans using native seed mixes identified in the CRMP (POD Appendix E), implementation of a Migratory Bird Assessment, Mitigation, and Compliance Plan (POD Appendix H) to identify and protect nesting birds in the project area, and compensatory mitigation to purchase and conserve native prairie grassland easements used by migratory birds. Therefore, cumulative impacts to migratory birds would be limited to temporary surface disturbance along the construction right-of-way and the conversion of the 40 acres of agricultural land to a storage/transfer facility. The land requirements and impacts associated with construction of other aboveground facilities would be considered negligible.

With implementation of the proposed mitigation measures, in addition to the purchase and conservation of native prairie grassland easements, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to migratory birds.

5.4.12 Aquatic Wildlife

Decreases in water quality could occur through increased run-off and pollution from oil and gas development, home and business construction, and impervious surfaces such as parking lots and roads. Degradation of aquatic habitats could occur through the effects of erosion and sedimentation, and/or through the accidental release of hazardous materials, particularly if a storm event occurs during construction activities. No new impervious surfaces are planned for the Bear Den Project other than portions of the 40-acre storage/transfer facility. Other projects in the area could have the potential to result in impacts to aquatic wildlife associated with erosion and sedimentation and/or the release of hazardous materials; however, quantitative impact information on water resources is not available at this time for many of these projects.

CEBCS has incorporated a variety of mitigation measures (SWPPP and SPCC; POD Appendices F and L respectively) to reduce and avoid adverse impacts to surface and ground water along the Project area as outlined in Section 4.5.2. In addition, the Little Missouri River and most other streams would be crossed using the HDD method. These measures would in turn avoid or appropriately minimize impacts to aquatic wildlife. Impacts to water quality would not be anticipated as a result of Project implementation; therefore, cumulative impacts would not be anticipated to surface or groundwater within the cumulative effects study area that McKenzie and Dunn Counties. During operation, a pipeline spill or rupture could result in short-term water quality impacts to surficial or shallow groundwater. However, the Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system, a remote leak detection and monitoring system would be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be identified immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance. Therefore no significant cumulative effects would be expected in the long term.

Environmental protection measures and mitigation measures would be implemented to minimize impacts to wetlands and waterbodies as part of the proposed Project. Loss of waterbody function is not anticipated from construction or operation of the Project. With implementation of the proposed mitigation measures and because loss of waterbody function is not anticipated from construction or operation of the Project, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to aquatic wildlife and any cumulative impacts would be limited to temporary surface disturbance activities within wetlands.

5.4.13 Terrestrial Wildlife

The cumulative effects study areas includes two counties (McKenzie and Dunn), which include approximately 3,160,000 acres of land. A total of approximately 914 acres would be disturbed by the proposed Project (Table 4.7.1-1). Impacts from Project construction and operation would include the

maintenance of approximately 454 acres of permanent easement that would provide wildlife habitat. These impacts would be less than 1/1000th of one percent of the entire cumulative impacts study area, and after construction would be reclaimed and would be useable by wildlife once again.

When the impact area of the proposed Project is added to the incremental impacts of current and foreseeable future projects wildlife species could be susceptible to cumulative impacts. Cumulative impacts to wildlife resources could be directly related to habitat loss or alteration by noxious weeds, habitat fragmentation, animal displacement, and direct mortalities. Other activities such as livestock grazing, agriculture, recreational activities, and increased noises associated with pets, people, or infrastructure also can contribute cumulative impacts to wildlife and their habitats.

Permanent surface disturbance incrementally adds to wildlife habitat loss, fragmentation, and displacement and/or mortality particularly in areas that could be at the relative carrying capacity for these resident species. In areas where development has occurred, habitat fragmentation could have resulted in the disruption of seasonal breeding or wintering patterns and/or migration routes. Historic, current, and future developments have resulted, or would result in the reduction of carrying capacities, as characterized by the amount of available cover, forage, and breeding habitats for wildlife species. As summarized in a 2011 North Dakota Oil and Gas Impact Report, if oil and gas development is affecting mule deer fawn and adult doe survival rates and if the northern half of the badlands is heavily impacted by oil and gas development, then mule deer numbers could decline by 25 percent to 50 percent in the next 20 years (Dyke et al., 2011). Although the installation of crude oil gathering pipelines requires linear development across a potentially wide area with the ability to impact a variety of terrestrial species, the placement of gathering pipelines can ultimately help reduce the amount of daily truck traffic accessing active oil well pads and disposal wells for collection and disposal. This in turn can decrease daily disturbance events and even road side mortalities of local wildlife species.

Many of the local wildlife populations (e.g., small game, migratory birds, etc.) that occur in the Project and surrounding areas would likely continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development. CEBCS would incorporate a variety of mitigation measures to reduce and avoid adverse impacts to terrestrial wildlife species including BMPs to protect water and soil resources, the avoidance of sensitive habitats where practicable, the release of wildlife that are caught in temporary construction trenches, the reuse of topsoil to aid in effective reclamation activities, the use of native forbs and grasses for reclaiming disturbed areas and others as stated in the CRMP (POD Appendix E) and as outlined in Section 4.13.2. With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to terrestrial wildlife species.

5.4.14 Cultural Resources

Cumulative impacts to cultural and historical resources within the Project area could occur as a result of erosion, increased access, and additional non-project-related ground disturbance such as livestock grazing. Increased access could lead to cumulative adverse impacts from recreational activities (e.g. ORV traffic, hiking, and hunting) and vandalism/unauthorized collection activities associated with the increase in population due to the energy development in the surrounding region. Significant cumulative effects to cultural and historical resources could occur if undocumented and unrecognized NRHP-eligible sites are impacted and unmitigated.

Past, present, and reasonably foreseeable future actions have altered and most likely would continue to alter the landscape surrounding the Project area. Because many of the impacts are indirect (illegal artifact collecting or digging), they are difficult to minimize or mitigate. Direct impacts to all identified NRHP-eligible sites located in the project APE that cannot be avoided would be mitigated in consultation with the SHPO, ACHP, and interested tribes and parties. In addition, any previously unknown NRHP-eligible sites that may be discovered during construction activities would be mitigated in accordance with the Plan for Unanticipated Discovery of Cultural Resources or Human Remains During Construction. Therefore, the

proposed Project is not expected to cumulatively contribute direct effects to NRHP-eligible sites. With implementation of the proposed mitigation measures and avoidance of eligible and unevaluated sites, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to cultural resources.

5.4.15 Tribal Treaty Rights and Interests

Tribes may have treaty rights and/or traditional cultural interests within the proposed Project area. Cumulative impacts to these areas and the associated traditional values could result from surface disturbance, surface structures, unauthorized collection, and natural erosion processes. The Project may temporarily reduce the amount of federal lands within which tribal members can exercise their hunting, fishing, and gathering rights outside of the reservations.

Short-term, temporary impacts may occur by changing the way in which a tribal member accesses resources for tribal use. There also may by short-term, temporary impacts to tribal treaty rights by the temporary restrictions of certain activities (e.g. hunting or gathering) during construction in the ROW corridor. Nonetheless, the Project, when added to past and present actions, would not be expected to significantly contribute to cumulative impacts to resources significant to tribes. The Project would not be expected to significantly contribute to long-term cumulative impacts to Indian trust resources as there will be no restrictions on accessing resources and/or areas for religious purposes in the ROW once construction has been completed.

5.4.16 Paleontological Resources

Clearing, excavation, boring, and other activities associated with the construction of new oil extraction facilities that would connect to the proposed Pipeline could impact paleontological resources associated with the proposed Project. Although many of the activities are characterized as temporary actions, paleontological resources are nonrenewable, and once removed or damaged cannot be recovered or recreated in the appropriate context for scientific analysis.

Increased activity and access in adjacent lands related to construction of the proposed Project could lead to increased erosion or illegal collection of paleontological resources. Direct impacts could be either negative, involving the destruction of important fossils, or beneficial, involving the discovery of important fossils that would otherwise have gone undetected. Increased human presence during the excavation process could lead to illegal collection of fossils. Indirect impacts could include long-term academic access to scientifically important fossils that may be uncovered during construction.

Depending on the significance and importance of the resource, the proposed project may contribute to cumulative impacts to paleontological resources. Even though mitigation measures are expected to minimize the residual impacts, the potential exists for the loss of paleontological resources; however, mitigation measures, including a pre-construction paleontological survey, monitoring of sensitive geologic units during construction, and implementation of the Plan for Construction Monitoring and Unanticipated Discovery of Paleontological Resources (POD Appendix J), would reduce direct impacts to paleontological resources and the proposed Project's incremental contribution to cumulative impacts.

5.4.17 Visual Resources and Scenic Byways

The visual character of the existing landscape is defined by historic and current land uses, such as rangeland/grazing, recreation, conservation, existing roads, trails, and utility corridors (e.g., pipelines). Existing oil and gas wells and facilities and roads have the most significant impact on the visual character of the Project area. The Project's contribution to impacts on visual resources would be minor relative to the past, current, and reasonably foreseeable future development in the area. The primary impacts to visual resources would be temporary during construction of the Project. Vegetation and contours would be temporarily effected, and clearing of woody vegetation in some draws and riparian zones would be required. The Project would be located adjacent to other facilities, roads, or utility rights-of-way where feasible so that the level of permanent change in the characteristic landscape would be relatively low.

After restoration, the corridor would be revegetated and visually subordinate to other existing and reasonably foreseeable manmade features, such as well pads and access roads. The proposed new aboveground facilities would have the most visual impact; however, the new aboveground facilities are generally minor with relatively low profiles, particularly on federal lands, and CEBCS would paint its aboveground facilities to blend into the existing landscape.

Reasonably foreseeable future development in the area would include additional aboveground oil and gas wells and facilities, as well as additional utility corridors. Although the Project is currently designed and scoped to service the transportation needs of a single production company, it is possible that connections with additional or third-party wells could also be pursued in the future, which could result in the need for expanded or additional facility components. If additional facilities were added to the Project their impacts would be primarily temporary in nature as additional ROW or minor aboveground facilities. Since the visual effects that would be associated with the Project are temporary and/or minor in nature when compared to the existing and foreseeable development in the area, the Project would result in minimal cumulative impacts to visual resources in the Project area.

5.4.18 Hazardous or Solid Wastes

According to the 2011 North Dakota Multi-Hazard Plan, Dunn County is rated as having a “low” hazardous material release hazard, and McKenzie County is rated as having a “moderate-high” rating because of a significant increase in oil and gas infrastructure in recent years. Reasonably foreseeable future development in the area that could contribute to cumulative effects includes additional oil and gas development and infrastructure, and increase in vehicular and rail traffic.

Pipeline construction requires the use of multiple substances that, if not handled correctly, could pose a threat to the environment and human health. By complying with federal, state, and local regulations and by implementing a spill plan (POD Appendix L), measures would be in place to minimize the potential impacts of construction-related hazardous and solid waste by the Project. Solid waste that would be generated during construction of the Project would be collected daily, placed in containers, properly accumulated, and disposed of at an approved landfill and/or waste disposal site. To sequester, control, and properly dispose of human waste generation, CEBCS would provide and maintain portable toilets throughout the Project area during construction. .

Pipelines are one of the safest forms of crude oil transportation and provide a cost-effective and safe mode of transportation for oil on land. During operation, a pipeline spill or rupture could occur although the probability of a crude oil or produced water spill resulting from a pipeline failure during operation is very low, and, consequently, the risk of associated environmental impacts would be minimal. The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. To further protect the integrity of the pipeline system, a remote leak detection and monitoring system would be installed to monitor pressures and flow rates at a central location 24 hours a day and 7 days a week. The SCADA system would allow abnormal operating conditions to be identified immediately and addressed promptly, including shutdown of the system in the event of a leak or other appropriate circumstance. Additional mitigation measures to address hazardous and solid waste related to the Project are discussed in Section 4.17.

With implementation of the proposed mitigation measures and compliance with applicable regulations, as well as adherence to applicable safety procedures to ensure long-term environmentally responsible construction and safe operation of the pipeline, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to hazardous or solid wastes.

5.4.19 Social and Economic Conditions

The economy in Dunn and McKenzie Counties is based on natural resources and dependent on farming, ranching, and energy development. Dunn and McKenzie Counties were the top oil-producing counties of

the state in 2011. A growing oil and gas industry along the prairies and badlands of North Dakota has resulted in a booming population, landfill waste load increases, increased used of municipal and well water, hospitals receiving more patients then staff can accommodate, housing shortages for the influx of temporary oil field workers, and new businesses and homes being established. The states' Special Projects Fund, which receives money from oil and gas revenues, is used for community infrastructure projects and in 2011 and 2012 funds were used on a variety of projects in the state including new fire department vehicles, new mobile homes for employee housing, contributions to the McKenzie County Healthcare System, sewer upgrades, and a new Wellness Center (McKenzie County Background Report, 2012). In May 2013, lawmakers in North Dakota passed legislation to provide more than 1.1 billion dollars in state aid to help western North Dakota communities deal with expanding energy development in the region. This aid will be funded by oil and gas production taxes for such things as road repair and other infrastructure improvements, law enforcement, emergency medical services, dust control, schools, hospitals, and nursing homes.

The proposed Project would require a construction workforce of approximately 200-250, and operation would require 15-20 new permanent employees. While this is a notable increase in population size for Dunn and McKenzie County, the increase would mostly be temporary and is not expected to have a significant, lasting impact on those counties. Based on publicly available data, there will be approximately 706 acres of surface disturbance in McKenzie County related to future energy projects and this will also bring an influx of temporary construction staff to the region that could cumulatively impact the local resources of McKenzie County. The associated revenues are significant to these counties and the state, and initiatives are in place to begin mitigating for the impacts that the oil industry has had in the region.

Since staff required for construction would be considered short-term and approximately 20 employees will oversee operations of the pipeline the increase in population would likely stimulate revenue within the local economy and because portions of oil and gas revenue is filtered back into those communities directly impacted by oil and gas development, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to social and economic conditions.

5.4.20 Land Use, Range Management, and Recreation

Existing land characteristics in the Project area consist of prairie lands, crop lands, shrub lands, badlands, canyons, wetlands, and flood plains. Existing land uses consist of limited range management, limited recreation, crop cultivation, and oil and gas exploration, production, and gathering. Reasonably foreseeable future development in the area that could contribute to cumulative effects includes additional oil and gas development and infrastructure.

Temporary and permanent changes to current land uses, principally the conversion of one land use such as open rangeland to another land use such as industrial/commercial, could result from construction of the Project, construction of current and/or planned projects, and other reasonably foreseeable projects. If other nearby projects were to be constructed at the same time and location, short-term cumulative impacts to land use activities could occur. Grazing, range improvement projects (including, but not limited to fencing), agriculture, recreational activities (including, but not limited to ORV traffic, hunting, and hiking), and oil and gas development may be temporarily interrupted. CEBCS's proposed reclamation measures would allow most land uses to continue during construction, and the disturbed land would be reclaimed to near pre-construction conditions following construction; except where new aboveground facilities are installed. Most impacts to land uses in the area would be temporary and localized, and long-term cumulative impacts to land uses would therefore be minimal. While existing and reasonably foreseeable oil and gas infrastructure, particularly aboveground wells and facilities, may permanently change the current land uses in the Project area, the Project would result in minimal additive or incremental temporary or permanent cumulative impacts to current land uses.

5.4.21 Access and Transportation

Roads in western North Dakota have been greatly impacted by the oil and gas industry, and McKenzie and Dunn Counties have seen some of the most significant increases in vehicle traffic. Extensive road improvements are needed as a result, and the state has established a Construction Program to prioritize the improvements. The NDDOT invested $635 million between 2008 and 2011 to improve infrastructure in this area, and spent an additional $305 million in 2012. Reasonably foreseeable future oil and gas exploration and production projects are likely to contribute to cumulative effects on transportation infrastructure and traffic.

During construction of the Project, traffic would be expected to increase throughout the Project area because of the need to transport materials and construction workers. The temporary increase in traffic would occur on highways, county roads, and minor access roads. The number of trucks required during construction would vary depending on the Project phase; however, the increase in traffic would be temporary and minimal, and would not over capacitate the roads. Road improvements such as grading, graveling, and bridge installations would be made as necessary, and all improved or heavily trafficked roads would be crossed using the bore method, minimizing traffic interruptions. Temporary use of roads in the Project area would therefore result in minimal, temporary cumulative impacts on transportation resources.

During operation of the Project, there would likely be a measurable positive effect on traffic. Currently, 84 daily truck trips are needed to transport crude oil and water to and from the serviced well facilities in the Project area. The Project would result in decreasing daily truck trips by approximately 60%.

With implementation of the proposed mitigation measures, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to access and transportation.

5.4.22 Public Safety

Potential Project-related impacts to public safety include hazardous material release, wildland fires, and transportation accidents. Reasonably foreseeable future development in the area that could contribute to cumulative effects includes additional oil and gas development and infrastructure.

During construction of the Project CEBCS would comply with federal, state, and local regulations, and by implementing a SPCC Plan (POD Appendix L), measures would be in place to minimize the potential impacts of releases of construction-related hazardous and solid waste by the Project. The Project would be designed, constructed, and operated in accordance with USDOT regulations, which would significantly minimize the potential for a spill or rupture of the pipeline system. During operation of the Project, the probability of a crude oil or produced water spill resulting from pipeline failure is very low, and, consequently, risk of associated impacts to public safety are considered minimal. To further protect the integrity and operation of the pipeline system it would be monitored 24 hours a day, from the OCC using a sophisticated SCADA system. Compliance with applicable regulations, effective monitoring of pipeline operations, as well as adherence to applicable safety procedures would help to ensure long-term responsible and safe operation of the pipeline, and minimize the potential for cumulative effects on public safety.

While it is unlikely that a wildland fire would result from the Project, CEBCS' POD would be followed to minimize impacts to public safety. In the unlikely event of a fire during construction of the pipeline CEBCS and its contractors will comply will all rules and regulation administered by the AO concerning the use, prevention, and suppression of fires on federal lands and appropriate landowners or land managing agencies would be notified. To limit the number of cars on the road travelling to and from the construction site and therefore increase public safety in the area, CEBCS will utilize buses to transport construction workers to and from the worksite.

With implementation of the proposed mitigation measures and the overall dependability of pipeline transportation, the Project, when added to past and present actions and reasonably foreseeable future actions, would not be expected to significantly contribute to cumulative impacts to public safety in the area.

5.5 Conclusions

Although many of the projects identified in our analysis could also be constructed within a similar timeframe as the proposed Project, any potential contribution to cumulative impacts of the proposed Project would be negligible due to the relatively small scope of this Project. The unrelated projects identified in the cumulative impact analysis would be of a different nature than the proposed Project, but would affect similar resources. Each of the unrelated projects would result in temporary and minor effects during construction, but each project would be designed to avoid or minimize impacts to air quality, wetlands, waterbodies, protected and special status species, and other sensitive resources. Additionally, significant unavoidable impacts to sensitive resources resulting from these projects would be mitigated. Mitigation generally leads to the avoidance or minimization of cumulative impacts. We therefore consider that the potential cumulative impacts of the existing and proposed projects under our review have been or would be minimized.

We believe that impacts associated with the proposed Project would be relatively minor, and numerous mitigation measures to further reduce the environmental impacts associated with the Project have been identified in this EA. The environmental impacts associated with the proposed Project would be minimized by careful Project routing, utilization of HDD techniques to avoid and minimize impacts to many sensitive resources, and implementation of appropriate mitigation measures. Consequently, only a small cumulative effect is anticipated when the impacts of the proposed Project are added to past, present, or reasonably foreseeable future projects in the area.

6.0 CONSULTATION AND COORDINATION

6.1 Agency Scoping

An initial agency scoping meeting was conducted in Bismarck, North Dakota on August 29, 2012. Agencies that participated in the initial scoping meeting or provided written comments during the agency scoping period included the U.S. Forest Service, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and the North Dakota Department of Game and Fish. Key issues discussed at this meeting or provided in letters included the following:

- special status species (federally listed, candidate, and USFS-sensitive species);
- migratory birds (compliance with the MBTA);
- soils and hydrology;
- noxious weeds;
- cultural resources;
- bighorn sheep lambing area in the Little Missouri River area;
- the USFS has a maximum construction ROW width of 50 feet and permanent ROW width of 20 feet across the LMNG for a single pipeline;
- wetland and riparian crossings;
- impacts to air quality; and
- degradation of roads and public safety.

An additional meeting, focusing on construction methodology and construction right-of-way widths/workspace requirements was held with USFS staff in Watford City, North Dakota on December 6, 2013.

6.2 Public Interest/Public Scoping

The BLM compiled a mailing list of agencies, organizations/companies, individuals, and other entities that may have an interest in the Project. The list includes federal, state, and local agency offices with jurisdiction over the Project, as well as potentially affected landowners, Native American tribes, and nongovernmental organizations (NGOs). An information letter describing the Project and requesting comments was distributed on November 4, 2012 to all individuals identified on the mailing list; a 30-day comment period was provided.

Public notices were published in the following regional newspapers during the first week of November 2012, notifying the public of the Project and soliciting comments:

- The Bismarck Tribune;
- Williston Daily Herald;
- Dickinson Press;
- Minot Daily News;
- Billings County Pioneer;
- Dunn County Herald; and
- McKenzie County Farmer.

Five comment letters were received during the public scoping period. A summary of the issues identified in these letters has been provided in Section 1.3.

7.0 PREPARERS AND REVIEWERS

Table 7-1 lists staff from various federal agencies and companies that contributed to the preparation and review of the EA.

TABLE 7-1

Bear Den Project
List of Preparers and Reviewers

Agency/Company	Name	Responsibility
Bureau of Land Management	Lowell Hassler	NEPA Project Lead
	Greg Liggett	Paleontology
	Shannon Gi bert	Cultural Resources, Tr bal
	Mark Sant	Cultural Resources, Tr bal
	Gary Smith	Cultural Resources, Tr bal
U.S. Forest Service – McKenzie Ranger District	Jessica Taylor	NEPA Coordinator
	L bby Knotts	Special Status Species - Botany
	Gary Foli	Special Status Species - Wildlife
U.S. Fish and Wildlife Service	Heidi Riddle	Threatened and Endangered Species
CenterPoint Energy Bakken Crude Services	Erik Dilts	Environmental Project Manager
Natural Resource Group, LLC.	Andrew Grammer	Project Manager
	Cameron Young	Deputy Project Manager, Special Status Species, Migratory Birds
	Tina Lyons	NEPA Document Specialist
	Heather Warchalowski	Special Status Species – Botany and Wildlife, Aquatic Wildlife, Terrestrial Wildlife
	Ashley Rosia	Air Quality, Noise
	Brian McQuown	Air Quality, Noise
	Kevin Weinke	Geology and Minerals, Soils
	Lisa Mash	Surface and Groundwater, Wetlands and Floodplains, Vegetation, Invasive Species
	DeAnn Thyse	Cultural Resources, Tr bal, Paleontology
	Patti Trocki	Tribal
	Darren Kennedy	Visual Resources, Land Use, Recreation
	Alissa Ingham	Hazardous Wastes, Social and Economic, Transportation, Public Safety
	Matt Lindholm	GIS

8.0 REFERENCES

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30 United States Code § 181 (2013)

33 United States Code § 1251 (2013)

33 United States Code § 2701 (2013)

36 Code of Federal Regulations § 220 (2013)

36 Code of Federal Regulations § 60.4 (2013)

36 Code of Federal Regulations § 800.5[a][1] and 800.16(d) (2013)

40 Code of Federal Regulations § 261.3 (2013)

40 Code of Federal Regulations § 302.4 (2013)

40 Code of Federal Regulations § 6 (2013)

40 Code of Federal Regulations § 60 (2013)

40 Code of Federal Regulations § 63 (2013)

40 Code of Federal Regulations § 93.153(b) (1) and (2). (2013)

40 Code of Federal Regulations §1500-1508 (2013)

40 Code of Federal Regulations §1508.7 (2013)

42 United States Code § 103.9601 (2013)

42 United States Code § 116.11049 (2013)

43 Code of Federal Regulations § 10 (2013)

43 Code of Federal Regulations § 1600 (2013)

43 Code of Federal Regulations § 2880 and 3160 (2013)

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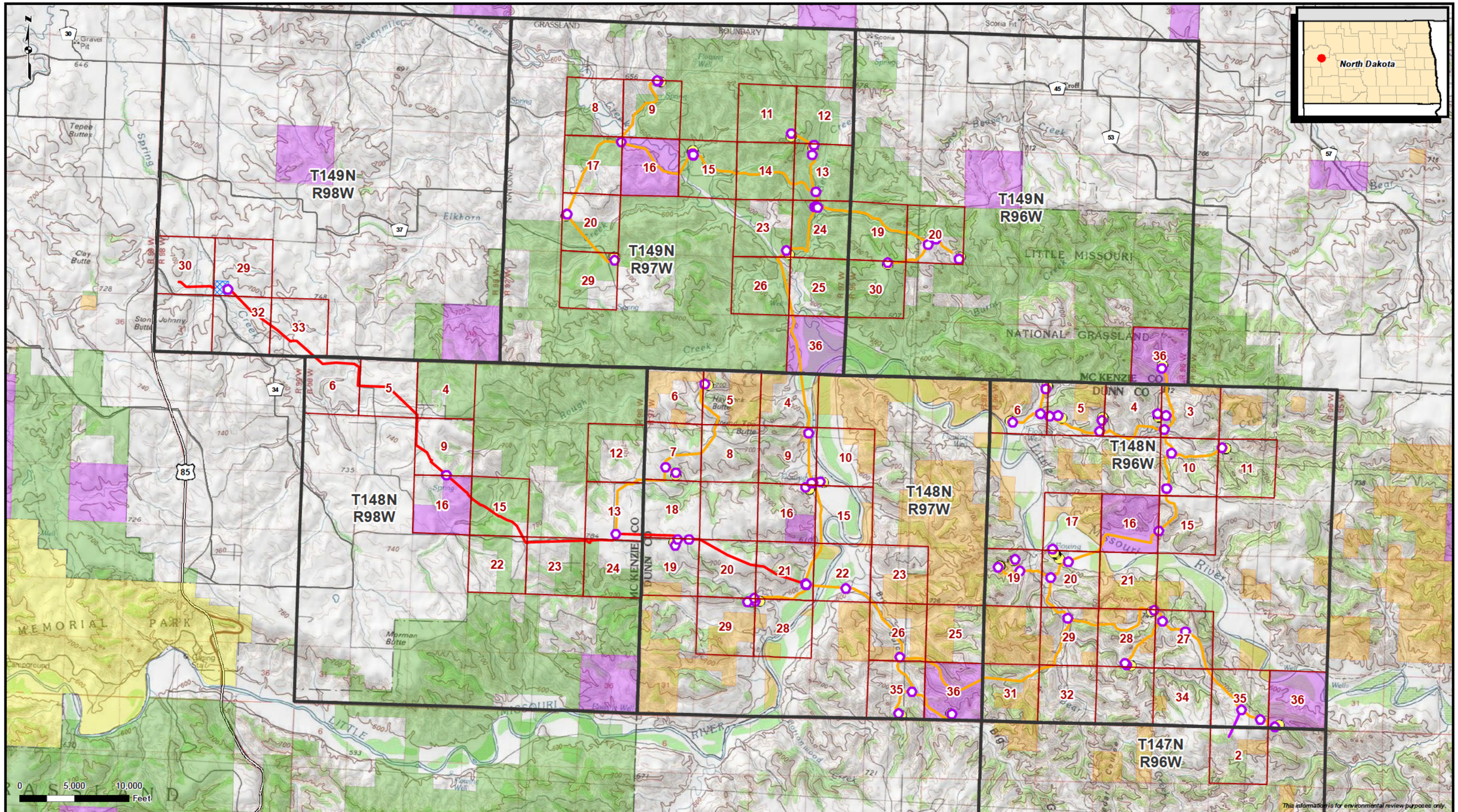
Attachments

Figure 1: Project Overview Map



Block Valves
Service Wells
Dual Pipes
Proposed Crude Line (only)
Proposed Produced Water Line (only)
North Dakota State Land
Bureau of Land Management Land
United States Forest Service Land
National Park Service Land

CenterPoint Energy

Figure 1
Project Overview
Bear Den Project
McKenzie County and Dunn County, North Dakota

NATURAL RESOURCE GROUP

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