BEAR DEN PROJECT

Plan of Development

APPENDIX H
Migratory Bird Impact Assessment, Mitigation, and Compliance Plan

BEAR DEN PROJECT

Plan of Development

Migratory Bird Impact Assessment, Mitigation, and Compliance Plan

Prepared for:

BUREAU OF LAND MANAGEMENT

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1.0 INTRODUCTION

CenterPoint Energy Bakken Crude Services, LLC (CEBCS) retained Natural Resource Group, LLC (NRG) to coordinate and manage the biological and cultural surveys required to support federal and state environmental permitting of the Bear Den Project (Bear Den Project or Project). NRG has developed this Migratory Bird Impact Assessment, Mitigation, and Compliance Plan to assess the potential for impacts to migratory birds, describe mitigation measures that will benefit migratory birds, and document efforts to avoid, minimize, and reduce possible impacts on migratory birds during construction. Part of this plan requires surveys for nesting migratory birds prior to commencement of construction activities along the Project's proposed pipeline route in North Dakota.

2.0 REGULATORY AUTHORITY AND GUIDANCE

Migratory birds include species that nest in the United States and Canada during the summer and migrate south to warmer regions of the United States, Mexico, Central and South America, and the Caribbean for the winter. The Migratory Bird Treaty Act (MBTA) protects migratory birds and most resident birds within the United States. With a few exceptions, all bird species that are native to the United States are protected by the MBTA. Under the MBTA, it is illegal to pursue; hunt; take; capture; kill; attempt to take, capture, or kill; possess; offer for sale; and export, import, or transport birds, their parts (e.g., feathers), and active nests (and the eggs or young within). Unlike the federal Endangered Species Act (ESA), the MBTA does not include harassment or destruction of habitat in its list of prohibitions or within its definition of take. Also, unlike the Bald and Golden Eagle Protection Act (BGEPA), the MBTA does not include disturbance within its definition of take. Using this definition, the MBTA prohibition that is germane to pipeline construction, operation, and maintenance is the killing of an individual or egg (through destruction of an active nest). Federal guidance regarding the MBTA includes Executive Order (EO) 13186, December 2008 Memorandum of Understanding (MOU) between the U.S. Fish and Wildlife Service (FWS) and U.S. Forest Service (USFS), April 2010 MOU between the FWS and the Bureau of Land Management (BLM), BLM and USFS guidance on National Environmental Policy Act (NEPA) conformance, and FWS guidance on MBTA conformance related to communication tower siting and operation. The above mentioned MOU's were created to further address EO 13186 (January 2001) in order to assess impacts of said agency activities on migratory bird populations and their habitats. CEBCS focuses on these documents in its approach to address migratory bird concerns and potential project impacts on migratory bird species of concern and their nesting habitats.

EO 13186 (January 2001) was established to ensure that the environmental impacts of a federal action 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 particular, EO 13186 states that federal agencies should establish a memorandum of understanding with the FWS that addresses the following, as practicable, when authorizing projects under federal jurisdiction:

- avoid and minimize adverse impacts on migratory birds;
- restore and enhance habitats;
- ensure that effects of federally approved actions on migratory bird populations are analyzed and that these analyses should focus on migratory bird species of concern;

- implement conservation measures to reduce the amount of unintentional take during project activities; and

- regularly monitor the above measures.

In December 2008, a MOU between the FWS and USFS was finalized per EO 13186 (USFS and FWS, 2008). In the MOU, the USFS commits to assessing impacts of agency activities on migratory birds by giving priority to species of concern, key risk factors, and priority habitats. To the extent practicable, consideration should be given to identify and minimize incidental take. The USFS should also coordinate with the FWS when planning actions that may have negative impacts on migratory bird populations and should develop measures to minimize negative impacts and maximize beneficial impacts.

In April 2010, a MOU between the FWS and the BLM was finalized per EO 13186 (FWS, 2010) that had similar concepts to the USFS-FWS MOU. In the MOU, the BLM committed to assessing the impacts of projects on migratory birds in the course of NEPA implementation, describe where take may have a measurable negative impact on populations of migratory birds, and give priority to species of concern, key risk factors, and priority habitats. In cases where take is expected, avoidance and minimization measures should be implemented, and if avoidance is not possible, the BLM will coordinate with the FWS and comply with permitting requirements.

The BLM has additional guidance for project planning and NEPA conformance with the MBTA (BLM, 2008; BLM, 2009). The guidance recommends analyzing a project's long-term impacts on populations and habitats following a four-step analysis when determining MBTA conformance. These include:

1) determine which species of conservation concern may occur in the project area;

2) determine the extent of the impacts on the overall habitat type;

3) determine the proportion of the affected habitat types in relation to the total amount of that habitat type available; and

4) consider seasonal restrictions for the project if significant proportions of a habitat type are affected, if the habitat is limited, or if the project will not provide a long-term benefit to bird species of conservation concern.

The FWS provides MBTA guidance on siting, construction, operation, and decommissioning of communication towers (FWS, 2000). In this guidance, FWS states that although individuals and companies cannot be absolved of MBTA offenses, the Office of Law Enforcement (OLE) typically reserves their prosecutorial discretion for individuals and companies that do not make good faith efforts to avoid and minimize projects impacts on migratory birds. The FWS also realizes there may be impacts to some birds even if all reasonable and effective measures are taken to avoid such impacts (FWS, 2012). In these cases, the FWS exercises enforcement discretion to focus on those individuals, companies or agencies that take migratory birds without implementing appropriate measures recommended by the guidelines (FWS, 2012).

In addition to the MBTA, the BGEPA is also applicable to the Bear Den Project. This law prohibits intentional take of an eagle, egg, or nest, including inactive and alternate nests (FWS, 2007b). The BGEPA definition of take includes disturbance of eagles, whereas the MBTA definition of take does not include disturbance. 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 a golden eagle to the degree that it causes injury or death (FWS, 2007a).

The above has been key guidance for the development of this *Migratory Bird Impact Assessment, Mitigation, and Compliance Plan* for the Bear Den Project.

In addition to this general guidance, CEBCS met with the FWS North Dakota Ecological Services Field Office in February 2013 to receive project-specific input. The amalgamation of these efforts solidifies CEBCS' approach and good faith efforts for the conservation of migratory birds and their habitats.

3.0 LIST OF SPECIES OF CONCERN

The first step in the assessment for the Bear Den Project was to identify migratory bird species of concern that could occur in the project area. To do this, CEBCS reviewed migratory bird species lists for the Central Flyway. CEBCS conducted comprehensive reviews of species' range information and habitat requirements in order to determine which species may be affected by the project. In addition, initial consultations with FWS for the Bear Den Project kick-off meeting in August 2012 helped refine this list. Table 3-1 reflects the final list of Migratory Bird Species of Concern potentially encountered by the Project.

CEBCS conducted individual impact analyses and effects determination of Piping Plover, Least Tern, Sprague's Pipit and Whooping Crane through the Section 7 consultation process of the ESA. These species are included in CEBCS' Draft Applicant-prepared Biological Assessment to be filed with the FWS in March 2013. If documented within the project area, CEBCS will establish buffer zones for these species and construction will be allowed to commence only when the chicks are fully fledged and able to fly. No active Sprague's Pipit nests will be removed during the construction of the proposed project. The above ESA-level protections and analysis are as stringent for individuals and nests as protections and analyses under the MBTA or EO 13186. Thus, no further analyses have been conducted. Per the Draft Applicant-prepared Biological Assessment, any anticipated impacts on individuals and habitat have been mitigated.

CEBCS conducted individual impact analyses and effects determination of Bald Eagle, Burrowing Owl, Baird's Sparrow, Loggerhead Shrike, and Long-billed Curlew as part of the USFS Sensitive Species consultation for the NEPA process. These species are included in CEBCS' Draft Applicant-prepared Biological Evaluation to be filed with the BLM in March 2013. If documented within the project area, CEBCS will establish buffer zones for these species and construction will be allowed to commence only when the chicks are fully fledged and able to fly. No active nests will be removed during the construction of the proposed project.

TABLE 3-1

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

Species	Ecoregion	Potential Habitat
American Bittern *Botaurus lentiginosus*	Little Missouri Badlands Missouri Plateau	Fringes and shorelines 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
Baird's Sparrow *Ammodramus bairdii*	Little Missouri Badlands Missouri Plateau	Mixed-grass and fescue prairie with scattered low shrubs and residual vegetation from previous year's growing season. Nests located in on ground in depression excavated by adult and also may place nest in natural depression or hoof print.
Bald Eagle *Haliaeetus leucocephalus*	Little Missouri Badlands Missouri Plateau	Forested areas adjacent to large waterbodies. Nests located in trees often within mature and old-growth forest with suitable waterbodies nearby for foraging.
Black-billed Cuckoo *Coccyzus erythropthalmus*	Little Missouri Badlands Missouri Plateau	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.
Burrowing Owl *Athene cunicularia*	Little Missouri Badlands Missouri Plateau	Well-drained, level to gently sloping areas characterized by sparse vegetation and bare ground within shortgrass or grazed mixed-grass prairie. They require underground burrows dug by mammals.
Chestnut-collared Longspur *Calcarius ornatus*	Little Missouri Badlands Missouri Plateau	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.
Dickcissel *Spiza americana*	Little Missouri Badlands Missouri Plateau	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.
Ferruginous Hawk *Buteo regalis*	Little Missouri Badlands Missouri Plateau	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, or low cliffs.
Golden Eagle *Aquila chrysaetos*	Little Missouri Badlands Missouri Plateau	Desert, grassland, and steppe in canyons or mountainous areas with rimrock terrain. Nests located on cliffs, trees, ground, river banks, or humanmade structures. Nests often have a view of the entire area surrounding the nest location.
Grasshopper Sparrow *Ammodramus savannarum ammolegus*	Little Missouri Badlands Missouri Plateau	Moderately open grassland and prairie with patchy bare ground. Distinctive ground nest is very difficult to locate and usually domed with overhanging grasses.
Horned Grebe *Podiceps auritus*	Little Missouri Badlands Missouri Plateau	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.
Least Tern *Sternula antillarum*	Little Missouri Badlands Missouri Plateau	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)
Lewis's Woodpecker *Melanerpes lewis*	Little Missouri Badlands Missouri Plateau	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.
Loggerhead Shrike *Lanius ludovicianus*	Little Missouri Badlands Missouri Plateau	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 likely provide increased protection from predators.

TABLE 3-1 (cont'd)

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

Species	Ecoregion	Potential Habitat
Long-billed Curlew *Numenius americanus*	Little Missouri Badlands Missouri Plateau	Open, sparse grassland. Ground nests are located in shortgrass or mixed-grass prairie with flat to rolling topography on relatively dry, exposed sites.
Marbled Godwit *Limosa fedoa*	Little Missouri Badlands Missouri Plateau	Northern prairies of Canada and U.S. Nests built in short, grassy cover in sparsely vegetated landscapes, grasslands, or wetlands in Northern prairies of Canada and U.S.
McCown's Longspur *Calcarius mcownii*	Little Missouri Badlands Missouri Plateau	Restricted to open habitat and sparse vegetation provided by the semi-arid shortgrass steppe. Nests are constructed in shallow depressions on the ground.
Mountain Plover *Charadrius montanus*	Little Missouri Badlands Missouri Plateau	Generally a bird of open, flat, dry tablelands with low, sparse vegetation. Nests on bare ground in shortgrass prairie of the Great Plains region.
Peregrine Falcon *Falco peregrinus*	Little Missouri Badlands Missouri Plateau	A wide variety of habitat is used from urban areas to lake edges to mountain ranges. Nests located on cliffs or other high platform structures.
Pinyon Jay *Gymnorhinus cyanocephalus*	Little Missouri Badlands Missouri Plateau	Dry environments with cliffs or bluffs and shrub-steppe deserts. Nests are located in cavities, ledges, crevices, bluffs, isolated rock outcrops, on cliffs, trees, and human-made structures.
Piping Plover *Charadrius melodus*	Little Missouri Badlands Missouri Plateau	Prairie alkali lakes and free flowing portions of the Missouri River and the Yellowstone River with barren river sandbars.
Prairie Falcon *Falco mexicanus*	Little Missouri Badlands Missouri Plateau	Native prairie and cropland that includes badlands, isolated buttes, and cliffs with ledges, small holes, caves or crevices to nest. Most nesting pairs (in ND) are cencentrated along the Little Missouri River Valley and adjoining prairie.
Red-headed Woodpecker *Melanerpes erythrocephalus*	Little Missouri Badlands Missouri Plateau	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.
Sage Sparrow *Amphispiza belli*	Little Missouri Badlands Missouri Plateau	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.
Sage Thrasher *Oreoscoptes montanus*	Little Missouri Badlands Missouri Plateau	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.
Sharp-tailed Grouse *Tympanuchus phasianellus*	Little Missouri Badlands Missouri Plateau	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.
Short-eared Owl *Asio flammeus*	Little Missouri Badlands Missouri Plateau	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.
Sprague's Pipit *Anthus spragueii*	Little Missouri Badlands Missouri Plateau	Frequently disturbed grasslands of intermediate height greater than 145 ha in size, and stubble and fallow fields (alfalfa, soybean, wheat) in fall. Prefer well-drained areas in open grassland for nesting.
Upland Sandpiper *Bartramia longicauda*	Little Missouri Badlands Missouri Plateau	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.

TABLE 3-1 (cont'd)

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

Species	Ecoregion	Potential Habitat
Yellow Rail *Coturnicops noveboracensis*	Little Missouri Badlands Missouri Plateau	Wet sedge meadows. Nests located in wet sedge meadows dominated by *Carex lasiocarpa* with moist substrate to standing water.
Whooping Crane *Grus americana*	Little Missouri Badlands Missouri Plateau	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.

Sources: Birds of North America (BNA), 2011; Deschant et al., 2003; Gomes, No Date; USFWS, 1990; USFWS, 2008; USFWS, 2011.

[a] List is from Birds of Conservation Concern, USFWS, 2008 and/or Birds of Management Concern and Focal Species, USFWS, November 2011.

4.0 IMPACT ANALYSIS

4.1 Landscape-scale Habitat Impact Analysis

Consistent with current BLM guidance, 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 (PIF) Bird Conservation Regions (BCRs), U.S. Geological Survey (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 (NABCI, 2007). One BCR is crossed by the proposed Bear Den 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. These include 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. Seventeen habitat types are crossed by the Bear Den Project, and are discussed in detail below.

4.1.1 Bird Conservation Region 17

BCR 17, also known as the Badlands and Prairies, extends west and south of the glaciated Prairie Pothole region, east of the Rocky Mountains, and north of the true shortgrass prairie. BCR 17 occurs in portions of five states: North Dakota, South Dakota, Montana, Nebraska, and Wyoming. Its climate is often characterized as having low annual precipitation and extreme winter low temperatures. This BCR is characterized as semi-arid grasslands dominated by mixed grass prairies. It encompasses approximately 91,084,753 acres in the Midwest. The Bear Den Project disturbs approximately 910.3 acres of BCR 17 for a total of 0.001 percent of the available geographic area impacted. Given the prevalence of migratory bird habitat within the region/BCR 17, impacts associated with construction and operation of the proposed Project would be less than significant.

4.1.2 Ecoregions

The Missouri Plateau Ecoregion is semi-arid mixed grass prairie with a mosaic of spring wheat, alfalfa, and pastureland in North Dakota. Generally, the climate is arid with cold winters and hot summers. Most of the ecoregion receives between 15-17 inches of precipitation a year (USGS, 2006). In North Dakota, the Missouri Plateau Ecoregion encompasses 12,800,000 acres. The Bear Den Project disturbs approximately 219.6 acres of this ecoregion for less than 0.01 percent of the available geographic area impacted. Given the prevalence of migratory bird habitat within the Missouri Plateau Ecoregion, the overall effect of the project on migratory bird habitat in this ecoregion is considered less than significant.

The Little Missouri Badlands Ecoregion is a highly dissected erosional landscape of conical hills. It has an annual rainfall ranging from 14 to 16 inches per year (USGS, 2006). Habitats in this ecoregion include shortgrass prairie with juniper in the draws and along north slopes. In North Dakota, the Little Missouri Badlands Ecoregion encompasses 1,633,280 acres. The Bear Den Project disturbs approximately 690.7 acres of this ecoregion for a total of 0.04 percent of the available geographic area impacted. Given the prevalence of migratory bird habitat within the Little Missouri Badlands Ecoregion, the overall effect of the project on migratory bird habitat in this ecoregion is considered less than significant.

4.1.3 Habitat Types

Habitats crossed by the Bear Den Project vary considerably. Table 4.1.3-1 provides a brief description of each habitat type, migratory birds species of concern associated with each habitat type, the total acreage of each habitat type in the ecoregions crossed, the acres impacted by the project, and the percent of each habitat impacted by the project. The project disturbs approximately 0.01 percent of the available habitats in the ecoregions crossed. Given the prevalence of migratory bird habitat within these habitat types, the overall effect of the project on migratory bird habitat in these habitat types is considered less than significant.

Physical disturbance, displacement, and clearing of herbaceous upland and wetland habitats could affect migratory birds at or near the time of construction, but such effects would be temporary and many habitats would generally recover quickly following construction. Upland and wetland forested habitats would be affected most substantially, with a long-term conversion of wooded areas to successional stages in the construction right-of-way and a permanent conversion to scrub-shrub or herbaceous levels within the permanent pipeline right-of-way. The permanent pipeline right-of-way 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 right-of-way is proposed on all state lands. There will be no permanent conversion of wetland forested habitats to scrub-shrub and/or herbaceous habitats along the permanent right-of-way.

TABLE 4.1.3-1

Bear Den Project
Migratory Bird Species of Concern and Associated Habitat Types

Habitat Type	Migratory Bird Species of Concern Associated with the Habitat Type	General Habitat Description	Acres Impacted
Cultivated Cropland	Dickcissel	·Lands tilled and planted to annual herbaceous small grain and row crops	131.2
Developed, Open Space	None	Open space is mostly landscaped vegetation, Areas are most commonly large lots with single family homes and recreation settings.	3.4
Disturbed, Non-specific	None	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	Ferruginous Hawk, Sage Sparrow, McCown's Longspur	Patchy distribution of shrubs among grassland habitat.	0.1
Inter-Mountain Basins Greasewood Flat	None	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	Grasshopper Sparrow, Dickcissel	Significantly altered landscape with no natural vegetation. All non-native perenials and forbs.	1.9
Northwestern Great Plains Mixedgrass Prairie	Grasshopper Sparrow, Dickcissel	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	Sage Sparrow, McCown's Longspur	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)	None	Areas of open water with less than 25% vegetative cover	0.7
Pasture/Hay	Grasshopper Sparrow, Dickcissel	Vegetation cover mainly comprised of introduced or enhanced native forage species used for livestock grazing.	4.4
Southwestern Great Plains Canyon	Pinyon Jay	A complex mosaic of grasslands, shrublands, and woodlands within the canyon system.	2.9
Western Great Plains Badland	Sage Sparrow, McCown's Longspur	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	Long-billed Curlew	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	Pinyon Jay	This ecosystem includes the bur oakdominated upland woods of bluffs and ravines, primarily in the mixed-grass prairie environment	3.7
Western Great Plains Floodplain Systems	Whooping Crane, Yellow Rail	Alluvial soils with periodic flooding dominated by floodplain forests, wet meadows, and gravel flats with grass cover under trees.	47.0
Western Great Plains Sand Prairie	Sage Sparrow, McCown's Longspur, Sprague' Pipit, Sharp-tailed Grouse	Contain elements of tallgrass and shortgrass priaries that are very susceptible to wind erosion because of the soil composition and vegetative cover.	7.5
Western Great Plains Wooded Draw and Ravine	Pinyon Jay	Occur on steep northern slopes or canyon bottoms with higher moisture levels than what is common for the area. Aspen, paper birch, and boxelder maples are common.	51.8
Total			**910.3**

5.0 HABITAT AVOIDANCE AND MINIMIZATION MEASURES

In an effort to be consistent with the MBTA, EO 13186, and the BLM guidance, CEBCS has reduced migratory bird impacts in several ways. CEBCS has avoided sensitive and rare habitats such as mineral deposits, talus slopes, and native prairie through careful routing. In addition, CEBCS has made right-of-way width reductions and right-of-way construction configuration changes to reduce and avoid impacts on other priority habitats such as forested areas and riparian wetlands. Agency input has also been considered during routing and during development of avoidance and minimization measures for listed species that directly benefit migratory birds as well. CEBCS has committed to restoration efforts to ensure that environmental impacts have been reduced or minimized after construction. CEBCS' habitat avoidance and impact minimization measures as they relate to EO 13186 and BLM guidance are discussed below.

5.1 Routing

EO 13186 instructs agency project proponents to avoid and minimize impacts on migratory birds. Linear rights-of-way are able to use routing as a tool to help avoid impacts on discrete habitats and features, thereby avoiding impacts on the birds that use these habitats and features to nest. During development of the proposed route, CEBCS has evaluated multiple alternatives to optimally design and locate the proposed facilities in a manner that minimizes its environmental footprint while meeting the purpose and need of the project. Although this effort was not conducted specifically for migratory birds, a route with the least environmental impacts will, in turn, have the least impact on migratory birds. The criteria implemented by CEBCS during evaluation and selection or rejection of alternate route configurations included review of technical and economic feasibility and constructability; quantitative evaluation of environmental constraints comprised of sensitive areas; and coordination with key stakeholders such as federal land management agencies, state and federal resource agencies, local planning departments, Tribal entities, and landowners. Existing data and available information from the BLM, USFS, FWS, North Dakota Game and Fish (NDGF) were obtained and reviewed to identify locations where sensitive species and habitats potentially occur along the proposed pipeline corridor. These data were mapped and incorporated into the various routing scenarios and quantitative route selection process. In addition, results of the general biological and wetland surveys conducted in 2012 as well as the species-specific special status plant surveys were used to further inform and refine the routing process. As new survey results became available, further adjustments to the route were made if necessary. This process identified the shortest route possible with modifications for constructability and considerations to avoid and minimize impacts to sensitive areas.

Beginning in early 2012, CEBCS evaluated potential routing constraints in consultation with the state and federal land management agencies including the North Dakota State Land Department (NDSLD), USFS, and the BLM. CEBCS has engaged the USFS in an effort to develop and refine a pipeline route that avoids or minimizes disruption to sensitive areas located within the Little Missouri National Grassland (LMNG) while considering existing energy and/or transportation corridors, constructability and slope stability, and ecological resources. These sensitive areas include wetlands, native prairie, and cap rock slopes. Early in the project planning efforts, the USFS resource specialists advised CEBCS of several resources of significant concern within the LMNG that the agency recommended for impact avoidance including native prairie, USFS Sensitive plants, geologic hazards (i.e., debris slides/flows, slumps, earthflow, channel crossings), wetlands, meadows, and bighorn sheep lambing areas.

After considering agency input and prior to completing its sensitive species surveys, CEBCS implemented conservation measures in the form of route modifications to avoid or minimize impacts on many species, particularly special status plants. While route modifications were not directly considered for migratory birds, benefits to birds from these route adjustments include the avoidance of the higher quality habitats along the pipeline right-of-way.

5.2 Horizontal Directional Drill

The Horizontal Directional Drill (HDD) method is another process that allows for trenchless construction across an area. With this method, a borehole is drilled under the area and a prefabricated segment of pipe is installed through the borehole, thereby avoiding disturbance to the surface of the right-of-way and to the area. HDDs are most commonly used to cross underneath sensitive or difficult to construct areas such as areas with slope stability issues, roads, wetlands, and waterbodies. HDDs provide a number of advantages over typical pipeline construction and installation methods, such as avoidance of surface disturbance, riparian tree clearing, and in-stream construction. If an HDD crossing is successful, there are little to no negative impacts on the sensitive area crossed. CEBCS plans to use the HDD crossing method in 106 locations (see Table 5.2-1), which will reduce overall project impact to potential migratory bird habitats by a total of 68.6 acres.

TABLE 5.2-1

Bear Den Project
Horizontal Directional Drill Impact Reduction

Line	Feature Crossed	Enter Milepost	Exit Milepost	Length (feet)	Access Required Across HDD Location (feet)	Acres Potentially Impacted if HDD Crossing Method Is not Used [a]	Impact (acres)
AR	Constructability	0.2	0.5	1300	0	2.2	0.0
AR	Constructability	2.2	2.2	150	15	0.3	0.1
AR	Road	2.4	2.5	275	15	0.5	0.1
AR	Road	3.6	3.6	125	15	0.2	0.0
AR	Constructability	4.0	4.1	200	15	0.3	0.1
AR	Road	5.2	5.2	175	15	0.3	0.1
AR	Waterbody	6.0	6.1	800	0	1.4	0.0
AR	Constructability	7.0	7.0	400	15	0.7	0.1
AR	Constructability	7.4	7.4	125	15	0.2	0.0
AR	Constructability	8.2	8.2	150	0	0.3	0.0
AR	Road	8.5	8.6	150	15	0.3	0.1
AR	Constructability	8.8	8.8	150	15	0.3	0.1
AR	Road	9.5	9.5	250	15	0.4	0.1
AR	Constructability	10.6	10.6	100	15	0.2	0.0
AR	Road	10.8	10.9	250	15	0.4	0.1
AR	Constructability	12.0	12.0	104	15	0.2	0.0
AR-3	Road	0.0	0.0	120	0	0.2	0.0
AR-6	Constructability	0.1	0.1	200	15	0.3	0.1
AR-7	Constructability	0.1	0.1	100	15	0.2	0.0
AR-8	Constructability	0.0	0.0	175	0	0.3	0.0
AR-13	Constructability	0.0	0.2	1145	15	2.0	0.4
AR-15	Constructability	0.1	0.1	165	0	0.3	0.0

TABLE 5.2-1 (cont'd)

Bear Den Project
Horizontal Directional Drill Impact Reduction

Line	Feature Crossed	Enter Milepost	Exit Milepost	Length (feet)	Access Required Across HDD Location (feet)	Acres Potentially Impacted if HDD Crossing Method Is not Used [a]	Impact (acres)
AR-15	Constructability	0.2	0.2	150	15	0.3	0.1
AR-15	Wetland and Waterbody	0.3	0.4	360	15	0.6	0.1
AR-16	Constructability	0.0	0.0	120	0	0.2	0.0
AR-16	Waterbody	0.1	0.2	400	0	0.7	0.0
AR-16	Constructability	0.4	0.4	120	0	0.2	0.0
AR-17	Constructability	0.1	0.2	300	15	0.5	0.1
AR-19	Wetland	0.1	0.2	350	0	0.6	0.0
AR-19	Constructability	0.3	0.4	500	15	0.9	0.2
AR-20	Waterbody	0.0	0.2	1000	15	1.7	0.3
AR-20	Road	0.7	0.7	150	0	0.3	0.0
AR-20	Wetland and Waterbody	0.8	0.9	730	0	1.3	0.0
AR-21	Road and Waterbody	0.0	0.1	550	0	0.9	0.0
AR-21	Constructability	1.0	1.1	150	0	0.3	0.0
AR-22	Road	0.0	0.2	800	15	1.4	0.3
AR-22	Constructability	0.2	0.3	575	0	1.0	0.0
AR-22	Road	0.3	0.5	700	15	1.2	0.2
AR-22	Wetland	0.8	0.8	215	0	0.4	0.0
AR-22	Constructability	1.1	1.1	200	0	0.3	0.0
AR-24	Constructability	0.1	0.3	1200	15	2.1	0.4
AR-24	Road	0.6	0.7	150	15	0.3	0.1
AR-24	Wetland and Waterbody	0.9	1.1	1250	0	2.2	0.0
AR-24	Wetland	1.2	1.3	300	15	0.5	0.1
AR-25	Wetland	0.5	0.5	150	0	0.3	0.0
AR-25	Wetland	0.8	0.8	160	15	0.3	0.1
AR-25	Waterbody	1.2	1.2	250	15	0.4	0.1
AR-25	Constructability	1.8	1.9	700	0	1.2	0.0
AR-25	Wetland and Waterbody	3.0	3.1	325	0	0.6	0.0
AR-26	Constructability	1.0	1.0	150	15	0.3	0.1
AR-27	Road	0.7	0.7	200	15	0.3	0.1
AR-27	Wetland	2.3	2.3	200	15	0.3	0.1
AR-27	Wetland and Waterbody	2.8	2.8	150	15	0.3	0.1
AR-28	Constructability	0.0	0.0	200	15	0.3	0.1
AR-28	Constructability	0.1	0.1	150	15	0.3	0.1
AR-28	Constructability	1.1	1.1	100	15	0.2	0.0
AR-28	Constructability	2.2	2.3	175	15	0.3	0.1
AR-28	Constructability	2.5	2.5	100	15	0.2	0.0
AR-28	Constructability	2.9	2.9	100	15	0.2	0.0
AR-28	Constructability	3.0	3.0	250	15	0.4	0.1

TABLE 5.2-1 (cont'd)

Bear Den Project
Horizontal Directional Drill Impact Reduction

Line	Feature Crossed	Enter Milepost	Exit Milepost	Length (feet)	Access Required Across HDD Location (feet)	Acres Potentially Impacted if HDD Crossing Method Is not Used [a]	Impact (acres)
AR-29	Constructability	0.1	0.1	150	0	0.3	0.0
AR-29	Constructability	1.6	1.7	350	15	0.6	0.1
AR-29	Road	2.1	2.1	100	15	0.2	0.0
AR-30	Road	0.0	0.1	400	0	0.7	0.0
AR-30	Road	0.5	0.6	160	0	0.3	0.0
AR-30	Constructability	1.1	1.2	100	0	0.2	0.0
AR-30	Constructability	1.8	2.1	1500	15	2.6	0.5
AR-30	Waterbody	2.4	2.5	140	0	0.2	0.0
AR-30	Waterbody	3.3	3.5	1125	0	1.9	0.0
AR-30	Wetland	3.5	3.8	1600	15	2.8	0.6
AR-30	Constructability	4.2	4.3	425	15	0.7	0.1
AR-30	Road and Waterbody	4.6	4.7	800	15	1.4	0.3
AR-30	Wetland and Waterbody	4.8	4.9	275	0	0.5	0.0
AR-30	Waterbody	5.3	5.3	300	15	0.5	0.1
AR-30	Waterbody	5.7	5.8	350	15	0.6	0.1
AR-30	Waterbody	6.0	6.1	501	15	0.9	0.2
AR-30	Waterbody	6.5	6.5	225	0	0.4	0.0
AR-30	Wetland and Waterbody	6.7	6.8	280	0	0.5	0.0
AR-30	Constructability	6.9	7.0	400	0	0.7	0.0
AR-30	Wetland and Waterbody	7.0	7.5	2800	0	4.8	0.0
AR-30	Wetland and Waterbody	11.2	11.8	2800	15	4.8	1.0
AR-31	Wetland and Waterbody	0.1	0.1	220	0	0.4	0.0
AR-31	Waterbody	0.8	0.9	105	15	0.2	0.0
AR-31	Road	2.5	2.5	120	0	0.2	0.0
AR-31	Wetland	2.6	2.6	325	0	0.6	0.0
AR-31	Road	2.8	2.9	100	0	0.2	0.0
AR-31	Constructability	3.4	3.6	1100	15	1.9	0.4
AR-31	Constructability	3.6	3.7	200	0	0.3	0.0
AR-31	Wetland and Waterbody	4.1	4.2	200	0	0.3	0.0
AR-31	Waterbody	4.6	4.6	125	0	0.2	0.0
AR-31	Constructability	5.0	5.1	600	15	1.0	0.2
AR-31	Constructability	7.4	7.6	800	15	1.4	0.3
AR-31	Wetland and Waterbody	9.0	9.3	1800	15	3.1	0.6
AR-32	Constructability	2.4	2.4	175	15	0.3	0.1
AR-32	Constructability	2.7	2.7	200	15	0.3	0.1
AR-34	Constructability	1.0	1.0	175	0	0.3	0.0
AR-34	Constructability	1.8	1.8	300	15	0.5	0.1

TABLE 5.2-1 (cont'd)

Bear Den Project
Horizontal Directional Drill Impact Reduction

Line	Feature Crossed	Enter Milepost	Exit Milepost	Length (feet)	Access Required Across HDD Location (feet)	Acres Potentially Impacted if HDD Crossing Method Is not Used [a]	Impact (acres)
AR-34	Constructability	2.0	2.0	250	15	0.4	0.1
AR-34	Wetland and Waterbody	2.6	2.6	225	0	0.4	0.0
AR-34	Constructability	2.7	2.8	325	15	0.6	0.1
AR-35	Road	0.1	0.1	100	15	0.2	0.0
AR-35	Wetland	0.3	0.4	1000	0	1.7	0.0
AR-35	Road	0.5	0.5	125	0	0.2	0.0
AR-35	Wetland	0.6	0.7	400	15	0.7	0.1
AR-35	Constructability	0.7	0.9	700	15	1.2	0.2
AR-35	Constructability	2.1	2.2	700	15	1.2	0.2
					Total	78.2	9.6

[a] Assumes a 75-foot-wide construction right-of-way

5.3 Right-of-Way Configuration and Optimization

In addition to routing, CEBCS will use various right-of-way configurations and optimizations to avoid and reduce impacts on migratory birds. In particular, many of these measures may benefit and at a minimum reduce or avoid impacts on migratory bird species of concern, consistent with EO 13186. For example, on federal lands the nominal construction right-of-way will be reduced from 125 feet to 80 feet, where dual (crude oil and produced water) pipelines would be installed, and from 100 feet to 50 feet, where a single pipeline would be installed (see Table 5.3-1). This measure will reduce overall ground disturbance for the project reducing potential impacts to migratory birds.

TABLE 5.3-1

Bear Den Project
Proposed Construction Right-of-Way and Permanent Right-of-Way by Landowner or Habitat Type
Where There is a Single or Double Pipeline

	Landowner/Habitat Type			
Pipeline/Right-of-Way	Federal (feet wide)	North Dakota Department Trust Lands (feet wide)	Privately Owned (feet wide)	Wetlands and Waterbodies (feet wide)
Single Pipeline				
Construction Right-of-Way	50	100	100	60
Permanent Right-of-Way	20	33	50	50
Two Pipelines				
Construction Right-of-Way	80	125	125	75
Permanent Right-of-Way	50	33	50	50

One specific measure that will reduce impacts on migratory birds will be collocation with other rights-of-way. In total, about 40.2 miles (58.6%) of the Project will be collocated with existing utility (e.g., other pipelines, power lines, 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 right-of-way abuts an existing pipeline, utility, or road right-of-way; or its proposed pipeline route is located generally parallel to a pipeline, utility, or road right-of-way and does not stray from this general alignment for a distance greater than 300 feet. For example, minor route variations from the adjacent pipeline, utility, or road rights-of-way that CEBCS has adopted at feature crossings (e.g., waterbody, utility) for engineering purposes are still considered collocated. This also includes areas where CEBCS' proposed pipeline route leaves an existing right-of-way and immediately realigns with another right-of-way.

In segments where CEBCS was unable to collocate, CEBCS will minimize impacts in sensitive environmental areas and high priority habitats to migratory birds such as wetlands and riparian zones by reducing the construction right-of-way width to 75 and 60 feet for dual and single pipeline installations, respectively, and placing additional temporary workspaces (ATWS) at least 50-feet outside of these areas as practicable. These areas were identified through agency review, general biological surveys, and existing data. Wetlands and riparian areas often have high species diversity and may be critical for some wildlife. These habitats have declined throughout the project area where vegetation has been converted by development, road building, agriculture, and pasture conversion. Riparian corridors can be extremely productive and diverse areas often supporting high species diversity of migratory birds, which may rely on intact riparian systems for foraging, hunting, refugia, or movement. Census results of nest site locations indicate that floodplain woodlands can support greater densities of birds than either herbaceous or upland habitats (Stauffer, 1980).

Riparian areas occur at many of the waterbody crossings along the pipeline route. In particular, the Bear Den Project crosses the Little Missouri River at two locations that contain extensive riparian areas. As a result of BLM and FWS consultations, CEBCS lengthened the planned horizontal directional drills (HDDs) at each of the Little Missouri River crossings to further avoid and minimize impacts to adjacent riparian habitats. Similarly, potential impacts on riparian communities across the project have been avoided and reduced through routing and project planning. Where practicable, CEBCS will use HDDs to minimize and avoid surface impacts to riparian areas.

In general, HDD implementation will avoid all direct surface disturbance to the traversed feature, but temporary surface disturbances, in the form of clearing of a 15-foot-wide travel lane, will occur at 11 of the planned 37 HDD crossings of riparian and wetland habitats. Such travel lanes will only be utilized where no reasonable alternative means of ingress or egress exists to access remote portions of the project construction right-of-way. Additionally, Best Management Practices will be implemented where appropriate when accessing those locations (e.g., cutting veg 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 will minimize construction width in riparian areas to reduce the extent of disturbance. For example, when crossing a wetland or riparian community, the nominal construction right-of-way will 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, CEBCS will spread annual wheatgrass to provide temporary cover while allowing native herbaceous and woody vegetation to become re-established without

excessive competition. Consistent with EO 13186, these measures will reduce the impacts on migratory birds nesting in riparian areas.

5.4 Restoration

Consistent EO 13186 guidance, CEBCS has developed restoration and enhancement measures that will reduce impacts on or benefit migratory bird species of concern. Following construction of the pipeline, restoration and reclamation of the disturbed work areas will occur following methods outlined in CEBCS' *Construction, Reclamation, and Monitoring Plan* (see Attachment 1). 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 will be de-compacted as needed and would be subject to final grading.

6.0 SEASONAL TIMING RESTRICTIONS

The FWS suggested that CEBCS also consider avoiding disturbance and incidental take through the adoption of seasonal avoidance measures. CEBCS' construction schedule was designed with consideration to an array of environmental and contractual constraints. To meet these objectives, it will be necessary to construct during parts of the migratory bird nesting season. Project construction is currently anticipated to begin in June 2013 and be substantively complete and in-service by October 2013, subject to receipt of all applicable federal, state, and local permits and approvals. Attachment 3 includes CEBCS' draft construction schedule. The construction schedule will be finalized when the project is approved and permits are issued. Actions that may impact nesting migratory birds during construction primarily include clearing and grading of the construction right-of-way, as it is anticipated that migratory birds would generally avoid the construction right-of-way following those actions.

7.0 CONSTRUCTION MITIGATION AND AVOIDANCE MEASURES

7.1 Pre-construction Migratory Bird and Raptor Nest Surveys, and Sharp-tailed Grouse Lek Surveys

CEBCS is committed to implementing the above-described conservation measures related to avoidance, minimization, and mitigation to reduce impacts on migratory birds during pipeline construction. In addition, CEBCS has committed to pre-construction surveys, and active migratory bird and raptor nest avoidance and monitoring, during construction. CEBCS has developed the following Migratory Bird and Raptor Nest Field Survey Protocol to define and communicate project-specific survey methods, team member roles and responsibilities, and coordination and reporting guidelines. Although sharp-tailed grouse are not migratory birds there are guidelines and standards associated with the protection of their active leks on USFS lands within the Project (LRMP, 2001). CEBCS has developed the following Sharp-tailed Grouse active lek and nest survey protocols to protect the species and adhere to the 2001 LRMP standards and guidelines for prairie grouse.

7.1.1 Migratory Bird and Raptor Nest Field Survey Protocol

CEBCS will assign a Migratory Bird Treaty Act Coordinator (MBTA Coordinator) to the Project. The MBTA Coordinator will have overall responsibility for survey coordination, resource allocation, status tracking and reporting, data collation, procedural review, and quality assurance for the Project's migratory bird nest field surveys. CEBCS will also identify a MBTA

Survey Crew Lead (MBTA Lead) on each spread who will be the primary responsible for the migratory bird nest surveys and protection measures in the field. In addition, a web based information portal will facilitate information sharing throughout the Project.

7.1.2 Migratory Bird Nest Surveys

It is anticipated that a total of four biologists will conduct migratory bird nest surveys ahead of construction clearing and grading crews within the proposed construction right-of-way and in ATWS areas from May through July 15 (one crew of two biologists per spread). MBTA survey crews, consisting of one MBTA Lead and one MBTA Survey Crew Assistant biologist (MBTA Assistant), will remain on the project as long as clearing is being conducted and identified migratory bird and raptor nests are active, but the number of personnel will be reduced as needs decrease (i.e., right-of-way is cleared, bird nesting season progresses). MBTA survey crews will work closely with the Lead EI (LEI) for their respective spreads to determine where surveys will be needed to ensure construction crews have access to the right-of-way on the day they are scheduled. The MBTA Lead will be responsible for confirming that access is approved on all parcels they are going to survey each day. Surveys will be coordinated so completion of survey for a tract is as close to the date construction crews are scheduled to do initial clearing as feasible; these surveys will be valid for 7 days (2 days for piping plovers and least terns at the Little Missouri River crossings). If construction crews do not start clearing within 7 days of when survey was completed, resurvey will be required prior to construction activities. Once clearing has gone through an area, it will not require additional survey, except for active nests that were found during surveys which require monitoring (see below).

7.1.2.1 Pedestrian Nest Surveys

Pedestrian surveys will be conducted by MBTA survey crews using a combination of methods based on habitat: systematic walking, rope dragging, and behavioral observations. These techniques have been shown to be most effective for identifying nesting grassland/prairie birds and the Bear Den Project crosses mostly grassland and agricultural land (Winter et al. 2003).

7.1.2.2 Systematic Walking

In areas with tall grasses or planted agricultural fields, MBTA survey crews will traverse a survey area at arm's width apart in a grid pattern searching for flushing birds as they walk. A stick or pole can be used to disturb the vegetation in front of the surveyors to aid in flushing birds in thick vegetation (Winter et al. 2003). If a bird is seen flushing from an area, MBTA survey crews will search for a nest near where the bird was seen. More than one pass across the survey area may be needed to identify all nests in that area; this is at the discretion of the MBTA Lead in each crew.

7.1.2.3 Rope Dragging

Rope dragging will be used in areas with short vegetation (i.e., shortgrass prairie, grazed pastures) to flush birds on nests. A rope is pulled across the survey area between two people, and flushes the bird from its nest. MBTA survey crews will watch for birds flushing just in front of, underneath, and behind the rope (Winter et al. 2003). If a bird is seen flushing from an area, surveyors will search for a nest near where the bird was seen. More than one

pass across the survey area may be needed to identify all nests in that area; this is at the discretion of the MBTA Lead in each crew.

7.1.2.4 Behavioral Observations

Behavioral observations will be a part of both rope dragging and systematic walking surveys. Nesting birds often display unique behaviors or cues such as: “alarm chipping; flushing within 5 meters and flying only a short distance; nest material in the bill; food in the bill; fecal sac in the bill; members of a pair in close vicinity to one another; distraction displays; repeated flights towards a distinct area; and begging vocalizations by nestlings” (Winter et al. 2003). MBTA survey crews will look for these cues during systematic walking and rope dragging surveys.

7.1.2.5 Raptor Nest Surveys

Raptor nest data has been provided to CEBCS by the USFS LMNG McKenzie District Office for species occurring on both federal and private land adjacent to or along the Project at various distances. Raptor nest locations have been identified for Swainson’s Hawks, Prairie Falcons, Merlins, Golden Eagles, Ferruginous Hawks, Burrowing and Great Horned Owls. 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. The first initial survey was conducted to identify all potential nests with the second survey targeting nest with unknown activity status.

7.1.3 Sharp-Tailed Grouse Lek Surveys

The USFS LMNG McKenzie District Office provided CEBCS with Sharp-tailed Grouse lek locations within and adjacent to the Project on state, federal, and private lands. The USFS data shows that there are approximately 14 sharp-tailed grouse leks within 1 mile of the construction right-of-way that were recorded between 1998 and 2007. If construction begins after June 15, the end of lekking season, known sharp-tailed grouse leks on USFS lands within 1 mile of the Project will not be surveyed for activity. If construction is to be implemented during the active lek season and within known lek locations, March 1 to June 15, known Sharp-tailed Grouse leks on USFS lands within 1 mile of the construction right-of-way will be surveyed to determine if they are active.

7.2 Actions for Active Nests/Leks

Active migratory bird nests, active Sharp-tailed Grouse nests, and inactive or active raptor nests found during surveys will be recorded. Each nest will be given a unique identification number to allow tracking of nests for monitoring activities. Nests which will require follow-up monitoring will be marked for ease of re-location in the field. GPS coordinates of the nest will be saved in the GPS unit, and a flag on a post will be placed a known distance and direction away from the nest to mark, but not disturb, the nesting bird. In areas with livestock, nest flagging will not be used so livestock are not attracted to the flag and trample the nest; these nests will be located for monitoring purposes using the recorded GPS coordinates and notes on the exact nest location on the survey form.

7.2.1 Protection Buffers for Active Migratory Bird Nests

Migratory birds that are not Species of Concern (Table 3-1) will receive a sufficient buffer around active nests to avoid disturbing breeding activities (USFWS, 2012); nest buffers will vary depending upon the species and their tolerance to activities near them. Migratory birds that are Species of Concern will receive a 30-foot nest buffer. All other migratory bird nests will be protected, but there will not be an established buffer distance for these species. For nests with buffers that fall within the construction right-of-way or within ATWS, the MBTA biologists will be responsible for installing signage and protective fencing or markers, and alerting the LEI on that spread and MBTA Coordinator to the location and restrictions for the active nests found that may affect construction activities.

7.2.2 Protection Buffers for Active Raptor Nests

Active raptor nests will dictate continued biological monitoring requirements for those active nests within the prescribed activity restriction buffers (Table 7.2.2-1), during construction. Monitoring of raptor activity on identified nests with buffers that impact construction activities will be conducted by the MBTA survey crews (see Active Nest Monitoring Section 7.2.1). Nests will be monitored once per week until the young have fledged (anticipated to be late-July in most instances), at which time the buffer will be lifted.

TABLE 7.2.2-1

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 (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.

7.2.3 Protection Buffers for Sharp-tailed Grouse

All active leks within 1 mile of the Project will receive a 1.0 mile buffer if construction occurs during the active lek season (March 1 – June 15) and construction activities will be limited within those buffers from March 1 to June 15 (LRMP, 2001). Buffers that impact construction activities will be monitored by the MBTA survey crews.

7.2.4 Active Nest Monitoring

Active nests will be monitored once per week until the young have fledged (anticipated to be mid-July or earlier in most instances) or the nest has failed, at which time the buffer will be lifted. If nests are identified adjacent to the right-of-way after ground clearing activities have commenced in an area, CEBCS will attempt to limit extensive

disturbance in the area, but will assume that because the birds initiated nesting after construction began in an area that the nesting individuals are acclimated to construction-related noise and disturbance and, therefore, additional protections will not be implemented.

8.0 COMPENSATORY MITIGATION BENEFITING MIGRATORY BIRD SPECIES OF CONCERN

8.1 Overview of Compensatory Mitigation

Avoidance, minimization, and restoration of project impacts on migratory bird species of concern are discussed above. In addition to these conservation measures, CEBCS has committed to compensatory mitigation for impacts on native grasslands that would also benefit many migratory bird species.

8.1.1 Native Grassland Restoration and Mitigation

In previous correspondence with CEBCS, the FWS has identified native prairie/grasslands as a key habitat type that will be affected by the project. CEBCS recognizes that native prairie provides habitat for migratory birds in addition to other species and that a longer recovery time is required to restore these areas relative to other vegetation cover types. For this reason, CEBCS proposes compensatory mitigation to offset the temporary reduction in habitat value of native prairie areas affected by construction of the project. CEBCS offers this compensatory mitigation program as an interested stakeholder and responsible corporate citizen. CEBCS notes, however, that compensatory mitigation for these impacts is not a requirement under the law.

The FWS has recommended that CEBCS compensate for the temporal reduction in habitat value of native prairie areas by providing funds for the purchase of land as perpetual easements (e.g., FWS conservation easements) or by fee-title acquisition. For its mitigation program, CEBCS will provide funding for the purchase of land as perpetual conservation easements in addition to restoring the construction right-of-way in native prairie areas to pre-construction condition to the extent practicable.

Based on the current route, CEBCS anticipates that construction of the project will temporarily affect about 108.8 acres of native grasslands on Federal lands. Because the pipeline predominantly crosses private lands, restoration of native grasslands in the right-of-way will be subject to individual landowner activities outside of CEBCS' control therefore these habitats were not identified during biological surveys. Following construction, approximately 68.0 acres of native prairie will remain within the permanent pipeline easement to be retained during operation of the facilities, but will be restored as near as practicable to pre-construction condition and use. The remaining 40.8 acres will be restored in the same manner, but will not be part of the permanent right-of-way. Accordingly, CEBCS will provide funds for the purchase of approximately 109 acres of grassland conservation easements. The FWS has indicated that the cost for grassland easements in 2012 is $260 per acre. This results in a total cost of $28,340.00

9.0 CONCLUSION

The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the U. S.

Department of the Interior. While the MBTA has no provisions for allowing unauthorized take, the FWS and CEBCS recognize that some birds (nests) may be taken during pipeline construction and maintenance activities even if all reasonable and practicable conservation measures to avoid take are implemented. The FWS' OLE has discretionary authority for the investigation and enforcement of the MBTA. In addition, the OLE also carries out its mission to protect migratory birds by fostering relationships with individuals and industries by helping them proactively reduce construction and operational impacts on migratory birds. While it is not possible to absolve individuals, companies, or agencies from liability, the OLE can focus its enforcement on those individuals, companies, or agencies who do not take pro-active measures to avoid and minimize impacts on migratory birds.

CEBCS' assessment of habitat impacts at three spatial scales (i.e., BCR, ecoregion, habitat type) shows that the impacts from the Bear Den Project on migratory bird habitat are expected to be less than significant and discountable. CEBCS recognizes that the construction of the Bear Den Project may result in impacts on individuals of some migratory bird species. Mitigation actions completed to address impacts on wetlands, when taken into consideration with CEBCS' routing, HDDs, right-of-way optimization, restoration, and revegetation efforts, will offset project impacts on migratory bird species of concern and other bird species along the project route. CEBCS has also committed to surveying and avoiding any active migratory bird nests. Collectively, these actions demonstrate CEBCS' good faith efforts to minimize impacts and provide benefits to migratory birds.

BEAR DEN PROJECT

ATTACHMENT 1
Construction, Reclamation, and Monitoring Plan

BEAR DEN PROJECT

Plan of Development

Construction, Reclamation and Monitoring Plan (CMRP)

Prepared for:

BUREAU OF LAND MANAGEMENT

June 2013

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1.0 STRUCTURE OF THE CONSTRUCTION AND RECLAMATION PLAN

The Construction, Reclamation, and Monitoring Plan (CRMP) is structured to address site-specific construction, reclamation, and revegetation plans for the CenterPoint Energy Bakken Crude Services, LLC (CEBCS) Bear Den Project (Project). This document combines CEBCS' Project-wide Best Management Practices (BMPs) and site-specific reclamation which has been developed based on federal land management documents and resource agency consultations. In addition, construction related mitigation measures are discussed where appropriate. Methods contained in this document may apply project-wide, or only to site-specific areas or conditions. Where appropriate, provisions that pertain to a specific management unit are discussed in greater detail.

2.0 PRECONSTRUCTION

2.1 Training

CEBCS has retained the services of experienced contractors and consultants, and has established an inspection and monitoring organization for the project consisting of knowledgeable and effective craft inspectors, environmental inspectors (EIs), resource inspectors (RIs), and other personnel. CEBCS' project management team will provide oversight of the project activities and will work closely with the contractors' key personnel to ensure compliance with CEBCS' project permits, agreements, and approved mitigation measures. Prior to construction, all CEBCS personnel and project Contractors shall complete training that covers prevention and response procedures as well as safety. The training shall be executed such that it improves awareness of laws and procedures pertaining to safety and pollution, as well as equipment maintenance and operation.

CEBCS will implement an environmental training program prior to the start of construction on each spread and on an ongoing, as-needed basis during construction to support compliance with environmental requirements. CEBCS' environmental training program is designed to consistently communicate project requirements to every individual working on the project so that both managers and workers understand CEBCS' expectations and the Project's requirements and incorporate them into their daily work activities. The training program will focus on CEBCS' environmental mitigation plans and procedures, the Project Plan of Development (POD), and other project-specific permit conditions including ROW Grant stipulations and conditions of approval. All personnel working on the project will be required to attend environmental training prior to entering the project right-of-way, aboveground facilities, and other associated work areas (e.g., contractor yards).

It is the construction contractor's responsibility to ensure that all persons involved in Project construction receive appropriate training. Each person trained will be required to sign a training attendance roster and will be issued a hard-hat sticker certifying that they have been notified of and understand the project's environmental requirements. No construction personnel will be allowed to enter any construction work area without prior environmental training. CEBCS will maintain environmental training attendance records.

2.2 Construction Right-of-Way Flagging and Project Signs

CEBCS will complete a final civil survey and stake/flag the right-of-way to locate the pipeline centerlines and the construction right-of-way boundaries. CEBCS will stake the Additional Temporary Workspace (ATWS) boundaries, staging areas, sensitive environmental areas,

reclamation treatment areas, access roads, and along the right-of-way every 200 feet, as appropriate, to maintain line-of-sight from one stake to the next. In preparation for surveying and staking, CEBCS will coordinate with local utilities within and adjacent to the proposed right-of-way utilizing the One Call system. CEBCS' contractor will be responsible for locating and marking underground crossings (e.g., gas and water pipelines, fiber optic cable, telephone lines, etc.), to prevent accidental damage during construction. Staking on the right-of-way and all ATWS will be inspected and maintained for the duration of construction and initial reclamation.

CEBCS will preserve all existing General Land Office, Bureau of Land Management (BLM), U.S. Forest Service (USFS), or other recognizable civil survey monuments, cadastral corner markers, witness points, triangulation stations, military control monuments, or other recognizable physical markers (public and private). If markers are disturbed or destroyed, CEBCS will notify the installing authority and the BLM's Authorized Officer in writing of the incident. CEBCS will be responsible for repairing markers using surveying procedures found in the *Manual of Surveying Instructions for the Survey of the Public Lands in the United States*.

Signs will be posted along the construction right-of-way to identify sensitive areas and to alert construction personnel of applicable restrictions. The limits of these areas will be delineated at the edge of the right-of-way. Fencing may also be required in some areas to further protect site-specific resources. Routine equipment maintenance will be restricted to contractor yards and commercial sites off the right-of-way.

CEBCS will require its construction contractor(s) to post caution signs on roads, where appropriate, to alert motorists of pipeline construction and warn them of slow traffic. In addition, trucks transporting pipe and heavy equipment will comply with all applicable state, county and federal laws, rules, and permits for these loads.

Prior to construction, CEBCS will coordinate with landowners to identify any landowner-specific issues of concern that may be affected by construction activities. In coordination with these landowners, CEBCS will implement mitigation measures, as applicable, that:

- avoid drain tiles and other types of irrigation systems;
- locate and mark aboveground and belowground water lines;
- locate and mark all above and belowground utilities;
- coordinate with landowners that utilize pivot irrigation systems;
- develop grazing deferment plans with landowners, tenants, or other grazing permit holders that address construction timing, fence cutting and bracing, cattle guard locations, and water requirements for livestock; and
- conduct baseline compaction surveys of the existing soil conditions, as requested by the landowner.

Any component of irrigation systems, waterlines, utilities, or other physical impediments damaged during construction will be repaired to at least pre-construction condition.

3.0 GENERAL PIPELINE CONSTRUCTION PROCEDURES

Construction of the main pipeline is planned for two simultaneous construction areas, or "spreads." Spread 1 is approximately 40.7 miles located in Dunn and McKenzie Counties, and Spread 2 is approximately 27.9 miles also located primarily in Dunn County (see Table 3-1). Aboveground facilities will be constructed by separate construction crews. Currently, construction is planned to start in June 2013, and is scheduled to be completed by October 2013, subject to the receipt of necessary permits and approvals.

TABLE 3-1

Bear Den Project
Construction Spreads

Spread Name	Segment Number	County
Spread 1	AR	Dunn/McKenzie
Spread 1	AR-1	McKenzie
Spread 1	AR-3	McKenzie
Spread 1	AR-4	Dunn
Spread 1	AR-5	Dunn
Spread 1	AR-7	Dunn
Spread 1	AR-9	Dunn
Spread 1	AR-11	McKenzie
Spread 1	AR-12	Dunn
Spread 1	AR-16	McKenzie
Spread 1	AR-18	McKenzie
Spread 1	AR-23	Dunn
Spread 1	AR-24	McKenzie
Spread 1	AR-25	McKenzie
Spread 1	AR-27	McKenzie
Spread 1	AR-28	Dunn/McKenzie
Spread 1	AR-31	Dunn/McKenzie
Spread 1	AR-33	McKenzie
Spread 1	AR-35	McKenzie
Spread 2	AR-2	Dunn
Spread 2	AR-6	Dunn
Spread 2	AR-8	Dunn
Spread 2	AR-10	Dunn
Spread 2	AR-13	Dunn
Spread 2	AR-14	Dunn
Spread 2	AR-15	Dunn
Spread 2	AR-17	Dunn
Spread 2	AR-19	Dunn
Spread 2	AR-20	Dunn
Spread 2	AR-21	Dunn
Spread 2	AR-22	McKenzie/Dunn
Spread 2	AR-26	Dunn
Spread 2	AR-29	Dunn
Spread 2	AR-30	Dunn
Spread 2	AR-32	Dunn
Spread 2	AR-34	Dunn

The typical Project construction right-of-way where there are two pipelines (crude oil and produced water) will be 80 feet wide on federal land, 125 feet on state and private lands, and 75 feet through wetlands. The typical Project construction right-of-way where there is a single crude oil gathering pipeline will be 50 feet wide on federal land, 100 feet on state and private lands, and 60 feet through wetlands. Standard pipeline construction is composed of specific activities that make up the linear construction sequence. These operations collectively include survey and staking of the right-of-way; clearing and grading; trenching; pipe stringing, bending, and welding; lowering the pipeline into the trench; backfilling the trench; hydrostatic testing; final tie-ins; commissioning; and right-of-way cleanup and restoration. Construction personnel and equipment will be limited to the areas required to conduct these activities. Appendix C of the POD depicts the typical steps of cross-country pipeline construction.

3.1 Clearing and Grading

Before clearing and grading are conducted, landowner fences will be braced and cut to landowner or land management agency specifications, and temporary gates and fences will be installed to contain livestock if present. A clearing crew will clear the work area of vegetation and obstacles (e.g., trees, logs, brush, rocks). The clearing crew will follow the fence crew and skim surface vegetation in areas of high fire danger to minimize the potential for wildfires. Where trees are felled, timber will be cut to uniform length and stacked along the edge of the right-of-way until disposal or use during reclamation. Stumps will be cut as close to the ground as possible and left in place except over the trenchline or as necessary to create a safe and level work surface.

Grading will be conducted where necessary to provide a reasonably level work surface. More extensive grading will be required in steep side slope or vertical areas to prevent excessive bending of the pipeline. CEBCS intends to use several topsoil stripping methods during construction. Where the ground is relatively flat and does not require grading, rootstock will be left in the ground.

3.2 Topsoil Removal and Storage

CEBCS proposes to use two topsoil removal techniques: trenchline plus spoil side or full right-of-way stripping (POD Appendix C, Figures 2 and 3). These techniques require a backhoe or bulldozer to remove the topsoil. It is currently anticipated that topsoil will be removed from the full right-of-way in most areas to avoid pulverization or rutting during wet periods, and in some instances, to mitigate heavy weed infestations. Topsoil and sub-soil will be stored in separate piles until reclamation occurs.

In most instances, topsoil and excavated subsoil will be placed and stored on the non-working side (spoil side) of the construction right-of-way. Gaps will be left between the soil piles to prevent stormwater runoff from backing up or flooding adjacent areas. In areas that are prone to wind erosion, CEBCS will wet down topsoil piles. Wetting down topsoil piles will create a crust across exposed soils and minimize soil loss by wind. EIs will inspect watered soils regularly and re-watering will occur as needed.

3.3 Rutting

In areas of the construction right-of-way where topsoil has not been removed, rutting from construction equipment will be considered excessive if greater than 4-inches. In consultation with CEBCS' EIs, topsoil removal techniques may be modified to remedy topsoil rutting. Rutting stipulations will not apply in areas where topsoil removal has occurred on the construction right-of-way. Rutting standards will apply to all roads on federal land, but rutting standards for private and public roads off of federal lands will be determined by individual landowner agreements.

3.4 Rocky Conditions

If rocky conditions are encountered, tractor-mounted mechanical rippers will be used to fracture rock prior to excavation. Rock will be stockpiled along the edge of the construction right-of-way and either used during reclamation. Rock 6 inches or larger in diameter will be disposed of at an off-site facility. Rock will not be permanently windrowed along the edge of the construction work area.

3.5 Temporary Erosion Control

The installation of temporary erosion controls will begin immediately following initial ground disturbance. Temporary erosion controls will be properly maintained throughout construction and reinstalled as necessary until replaced by permanent erosion controls. Temporary erosion controls that will be used during construction include the following:

3.5.1 Temporary Slope Breakers

Temporary slope breakers are intended to reduce runoff velocity and divert water off the construction right-of-way (POD Appendix C). Temporary slope breakers may be constructed of materials such as compacted soil, staked straw bales or sand bags.

CEBCS will install temporary slope breakers to avoid excessive erosion. Temporary slope breakers will be installed on slopes greater than five (5) percent at the following spacing, as well as where the base of the slope is less than 50 feet from waterbody, wetland, and road crossings:

Slope (percent)	Spacing (feet)
5 to 15 percent	300 feet
> 15 to 30 percent	200 feet
> 30 percent	100 feet

On slopes less than five percent that are located in areas not prone to soil movement or erosion (e.g., rocky soil conditions) slope breakers may be eliminated at the discretion of the EIs. Slope breaker spacing may also be modified to correspond with slope breakers from adjacent rights-of-way.

The outfall of each temporary slope breaker will be directed to a stable, well-vegetated area or into an energy-dissipating device at the end of the slope breaker. The outfall of each temporary slope breaker will be positioned so as to prevent sediment discharge into wetlands, waterbodies, or other sensitive resources. The requirements stated in section 3.5.1 also apply to permanent slope breakers.

3.5.2 Sediment Barriers

Sediment barriers are intended to stop the flow of sediments and to prevent the deposition of sediments into sensitive resources. As shown in Appendix C of the POD, sediment barriers may be constructed of materials such as silt fence, staked, certified weed-free straw bales, compacted earth (e.g., drivable berms across travelways), sand bags, or other appropriate materials. Where silt fence is used, J-hooks will be installed at outlets.

At a minimum, CEBCS will install and maintain temporary sediment barriers across the entire construction right-of-way at the base of slopes greater than five percent where the base of the slope is less than 50 feet from a waterbody, wetlands, or road crossing until construction is complete. Adequate room will be left between the base of the slope and the sediment barrier to accommodate ponding of water and sediment deposition.

Where wetlands or waterbodies are adjacent to and downslope of construction work areas, CEBCS will install sediment barriers along the edge of these areas, to prevent sediment flow into the wetland or waterbody.

In travel lanes, CEBCS may install drivable berms rather than removable sediment barriers such as straw bales. The EI may specify one technique or the other.

3.6 Trenching

After grading, two pipeline trenches (i.e., one for the steel, crude oil pipeline and one for the composite, produced water pipeline) will be dug in sequence using rotary trenching machines, track-mounted backhoes, or other similar equipment. The two pipelines will be constructed by separate construction crews working independently of one another, with the steel pipeline construction spread preceding the composite pipeline construction spread. The trenches will be excavated to a depth that provides sufficient cover over the pipelines, after backfilling, to protect the lines from surface loads and to moderate ambient temperature fluctuation, which could adversely affect system hydraulics. The pipelines will each be buried in an approximately 5- to 10-foot-wide and 7-foot-deep trench. Additional cover may be provided at road and waterbody crossings. The trench width will provide adequate clearance from trench walls for safe installation of the pipelines. In sandy, unstable soils, the trench could be considerably wider, as the walls could cave or slough during trenching.

3.6.1 Open Trench Wildlife Mitigation

During sensitive wildlife timeframes (sheep lambing period), trench plugs will be installed at a maximum of 0.5-mile intervals and at visible wildlife game trails and livestock watering trails that intersect the trench line. Twenty-foot gaps will be left in spoil and topsoil stockpiles at all trench plugs. Suitable ramps will be installed from the bottom of trench to the top with a 5-foot-wide open path across the trench plug. A corresponding gap in the welded pipe string will be left at each trench plug.

3.7 Pipe Stringing, Bending, and Welding

3.7.1 Crude Oil Pipeline

Following trenching, sections of externally coated, steel pipe up to 80 feet long (also referred to as joints) will be transported over public road networks and authorized private access roads to the right-of-way by truck and placed or "strung" along the trench line.

After the pipe sections are strung along the trench and before they are joined together, individual sections of the pipe will be bent where necessary to allow for uniform fit of the pipeline with the varying contours of the bottom of the trench. Typically, a track-mounted, hydraulic pipe-bending machine will tailor the shape of the pipe to conform to the contours of the terrain. Where direction changes require bends greater than what can be properly bent in the field, a factory made fitting will be used. After the pipe sections are bent, they will be welded together into long sections and placed on wooden support skids.

Each weld must exhibit the same structural integrity with respect to strength and ductility as the pipe. Welds will be inspected by quality control personnel utilizing either X-ray techniques or other DOT-approved non-destructive examination to determine the quality of the weld. Welds that do not meet established specifications will be repaired or removed. Once the welds are approved, a protective epoxy or other suitable coating will be applied to the welded joints. The pipeline will then be electronically inspected or "jeeped" for faults or voids in the epoxy coating, and visually inspected for any faults, scratches, or other coating defects. Damage to the coating will be repaired before the pipeline is lowered in.

3.7.2 Produced Water Pipeline

Following installation and backfill of the crude oil pipeline, a separate crew would excavate the second trench and install the produced water pipeline. The produced water pipeline will be constructed of a high-pressure composite material rather than steel. This line will be delivered to the right-of-way in spools, and deployed from the reel into the trench. The segments of pipe will be fastened using a swaged system of midline fittings that do not require welding or x-ray inspection. Once the produced water pipeline is positioned in the trench, the trench would be backfilled, and right-of-way restoration would commence.

3.7.3 Fiber Optic Communication Line

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

3.8 Lowering-in, Trench Dewatering, Trench Breakers and Backfilling

Before the pipelines are lowered in, the trench will be inspected to be sure it is free of wildlife that may be trapped in the trench as well as rocks and other debris that could damage the pipe or protective coating. In rocky areas, padding material such as finer grain sand, soil, or gravel will be placed in the bottom of the trench to protect the pipeline. No topsoil will be used as padding material. The pipeline may also be wrapped in a rock shield, which is typically made of fabric or screen. Excess rock will be removed from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas.

During construction, open trench sections may fill with water due to weather events. In these instances, trench sections will be dewatered by pumping water out and discharging it in an upland area, or into sediment filtration/energy dissipation device, within the approved workspace. Dewatering devices will typically be located on the edge of the construction right-of-way. See CEBCS' Storm Water Pollution Prevention Plan (SWPPP) located in Appendix F of the POD.

Trench breakers may be installed where needed. Trench breakers are intended to slow the flow of subsurface water along the closed trench. Trench breakers may be constructed of materials such as sand bags or polyurethane foam; topsoil will not be used to form trench breakers. Appendix C of the POD shows a typical trench breaker installation. Trench breaker locations will coincide with slope breakers, unless the EIs recommend modified spacing. Spacing intervals for trench breakers will be the same as those described for temporary and permanent slope breakers in Section 3.5.1. At a minimum, CEBCS will install a trench breaker at the base of slopes greater than 5 percent where the base of the slope is less than 50 feet from a waterbody or wetland and where needed to avoid draining a waterbody or wetland.

Soils will be replaced from the horizon in which they occur. First, subsoil will be returned to the trenched area. Topsoil will be replaced last at the ground level. Soil will be mounded over the trench only to allow for normal soil settling.

3.9 Hydrostatic Testing

After backfilling, the pipelines will be hydrostatically tested with pressurized water to ensure the system is capable of withstanding the operating pressure for which it is designed. The pipelines will be broken into 'test segments'. These test segments have been determined by water availability, water permitting requirements, and terrain. It is anticipated that water for hydrostatic testing will primarily be obtained from municipal or commercial sources, but a combination of groundwater and surface water sources could also be used subject to applicable landowner agreements and permit stipulations. Test segments of the pipeline will be capped, filled with water, and pressurized. Any loss of pressure that cannot be attributed to other factors such as temperature changes will be investigated. Any leaks detected will be repaired and the segment retested.

After completion of hydrostatic testing, the pipelines will be cleaned and dried using mechanical tools (pigs) that are moved through the pipelines with pressurized, dry air. Details related to hydrostatic testing, including water requirements, withdrawal and discharge locations, aquatic mitigation techniques used during withdrawal, and discharge mitigation techniques, are located in the *Hydrostatic Testing Plan* (POD Appendix P).

3.10 Tie-Ins, Commissioning, and Markers

Following successful hydrostatic testing, test manifolds will be removed and the final pipeline tie-ins will be made.

After final tie-ins are complete, the tie-in welds have been inspected, and the line is sufficiently dried, pipeline commissioning will commence. Commissioning involves activities to verify that equipment is properly installed and working, the controls and communications systems are functional, and that the pipelines are ready for service. Finally, the pipelines will be prepared for service by purging the line of air and loading the line with product.

Markers showing the location of the pipelines will be installed at fence and road crossings in order to identify the owner of the pipelines and convey emergency information in accordance with applicable governmental regulations, including DOT safety requirements. Special markers providing information and guidance to aerial patrol pilots will also be installed.

4.0 SPECIAL PIPELINE CONSTRUCTION PROCEDURES

In addition to standard pipeline construction methods, CEBCS will use special construction techniques where warranted by site-specific conditions. These special techniques will be used when constructing across paved and unpaved roads, railroads, utility crossovers, steep terrain, unstable soils, waterbodies, wetlands, when blasting through rock, or avoiding sensitive resources.

4.1 Road, Highway, Railroad, Foreign Utility Crossings

Construction across paved roads, highways, and railroads will be in accordance with the requirements of CEBCS' road and railroad crossing permits and approvals. Major paved roads, highways, and railroads will be crossed by the Horizontal Directional Drill (HDD) method or using a conventional road bore. A road bore requires the excavation of a pit on each side of the feature, the placement of boring equipment in the pit, then boring a hole under the road at least equal to the diameter of the pipe. Once the hole is bored, a prefabricated pipe section will be pulled through the borehole. For long crossings, sections may be welded onto the pipe string just before being pushed through the borehole. There will be little or no disruption to traffic at road, highway, or railroad crossings that are bored.

Some smaller, unpaved roads and driveways may be crossed using the open-cut method where permitted by local authorities or private owners (see figure 13). The open-cut method will require temporary closure of the road to traffic and establishment of detours. If no reasonable detour is feasible, at least one lane of the road being crossed will be kept open to traffic, except during brief periods when it is essential to close the road to install the pipelines. Most open-cut road crossings will be completed and the road resurfaced in a few days. CEBCS will take measures such as posting signs at open-cut road crossings and utilizing flagmen to ensure safety and minimize traffic disruptions.

Additionally, CEBCS has developed a *Transportation Plan* (see POD Appendix N). The *Transportation Plan* is intended to mitigate potential impacts of project-related road use and construction activity, and to maintain and/or moderately upgrade existing access roads, consistent with project needs relating to the useful management of resources. CEBCS is currently working with the counties crossed by the pipelines' route to obtain permits and develop road mitigation that might be necessary for construction and post-construction of the project.

Driveway installation to permanent, aboveground facilities are depicted on the aboveground facility plot plans located in Appendix B of the POD These roads will be wholly contained within the right-of-way, or constructed within parcels that CEBCS has identified for the construction of aboveground facilities.

Foreign pipeline and road and railway crossing designs will conform to good engineering practices and to the requirements of the applicable facility owner or regulatory authority (e.g., DOT, County Department of Public Works).

4.2 Side Slope Cutting and Steep Terrain

Side slope cutting will occur in rough, steep terrain, and in areas where rerouting the pipelines is not feasible due to mitigating factors such as sensitive resource avoidance, paralleling road ways, existing utilities, etc. Where the pipelines cross laterally along the side of a slope, cut, and fill grading may be required. Generally, on steep side slopes, soil from the high side of the right-of-way will be excavated and moved to the low side of the right-of-way to create a safe and level work terrace. This process will require sufficient construction right-of-way width, or ATWS. Specifically, CEBCS has determined that side slopes greater than 10 degrees or 17 percent grade will require special construction practices and ATWS, where the construction right-of-way width is otherwise restricted (e.g., federal lands). After the pipelines are installed, the soil from the low side of the right-of-way will be returned to the high side, and the slope's original contours will be restored (see POD Appendix B for workspace requirements and layout). Mulch will be applied on slopes exceeding 10 percent (see section 6.6 Mulching Crimping and Punching). Commercial erosion control fabrics and soil pocking are other measures that will be used to stabilize slopes exceeding 20 percent.

When disturbed by construction through vegetation removal, parts of the project area may be susceptible to erosion if water from snowpack runoff and intense rainfall events are not controlled. Based on site-specific conditions, CEBCS has identified measures that will be implemented to prevent slope failure. The EIs may modify these mitigation measures on a case-by-case basis. Table 4.2-1 lists the locations of steep slope areas by milepost where ATWS/special construction practices will be required.

TABLE 4.2-1

Bear Den Project
Steep Side Slope or Other Sensitive Area

Line Name	Feature Description	Enter Milepost	Exit Milepost	Length (feet)
AR	Steep Side Slope	0.2	0.5	1300
AR	Steep Side Slope	2.2	2.2	150
AR	Steep Side Slope	4.0	4.1	200
AR	Steep Side Slope	7.0	7.0	400
AR	Steep Side Slope	7.4	7.4	125
AR	Steep Side Slope	8.2	8.2	150
AR	Steep Side Slope	8.8	8.8	150
AR	Steep Side Slope	10.6	10.6	100
AR	Steep Side Slope	12.0	12.0	104
AR-6	Steep Side Slope	0.1	0.1	200
AR-7	Steep Side Slope	0.1	0.1	100
AR-8	Steep Side Slope	0.0	0.0	175
AR-13	Steep Side Slope	0.0	0.2	1145
AR-15	Steep Side Slope	0.1	0.1	165
AR-15	Steep Side Slope	0.2	0.2	150
AR-16	Steep Side Slope	0.0	0.0	120
AR-16	Steep Side Slope	0.4	0.4	120
AR-17	Steep Side Slope	0.1	0.2	300
AR-19	Steep Side Slope	0.3	0.4	500
AR-21	Steep Side Slope	1.0	1.1	150
AR-22	Steep Side Slope	0.2	0.3	575
AR-22	Steep Side Slope	1.1	1.1	200
AR-24	Steep Side Slope	0.1	0.3	1200
AR-25	Steep Side Slope	1.8	1.9	700
AR-26	Steep Side Slope	1.0	1.0	150
AR-28	Steep Side Slope	0.0	0.0	200
AR-28	Steep Side Slope	0.1	0.1	150
AR-28	Steep Side Slope	1.1	1.1	100
AR-28	Steep Side Slope	2.2	2.3	175
AR-28	Steep Side Slope	2.5	2.5	100
AR-28	Steep Side Slope	2.9	2.9	100
AR-28	Steep Side Slope	3.0	3.0	250
AR-29	Steep Side Slope	0.1	0.1	150
AR-29	Steep Side Slope	1.6	1.7	350
AR-30	Steep Side Slope	1.1	1.2	100
AR-30	Steep Side Slope	1.8	2.1	1500
AR-30	Steep Side Slope	4.2	4.3	425
AR-30	Steep Side Slope	6.9	7.0	400
AR-31	Steep Side Slope	3.4	3.6	1100
AR-31	Steep Side Slope	3.6	3.7	200
AR-31	Steep Side Slope	5.0	5.1	600
AR-31	Steep Side Slope	7.4	7.6	800
AR-32	Steep Side Slope	2.4	2.4	175
AR-32	Steep Side Slope	2.7	2.7	200
AR-34	Steep Side Slope	1.0	1.0	175
AR-34	Steep Side Slope	1.8	1.8	300
AR-34	Steep Side Slope	2.0	2.0	250
AR-34	Steep Side Slope	2.7	2.8	325
AR-35	Steep Side Slope	0.7	0.9	700
AR-35	Steep Side Slope	2.1	2.2	700

4.2.1 Stockpiling

On steep slopes where topsoil, woody debris, and rock cannot be conventionally stockpiled at the edge of the construction right-of-way, the contractor will push the material to ATWS for use during restoration.

4.2.2 Temporary Slope Breakers

Temporary slope breakers will be installed after the right-of-way is graded. In most cases, temporary slope breakers will be spaced at intervals determined by the EI. A temporary breaker will be installed 10 to 30 feet from the crest of a slope to act as a reference point for spacing the remaining breakers. Slope breakers will be inspected on a daily basis in areas of active construction; on a weekly basis in areas with no active construction; and within 24 hours of each 0.5-inch or greater rainfall.

Temporary slope breakers may be omitted where the surface is predominately rock and the potential for erosion is minimal.

4.2.3 Trench Breakers

Trench breakers will be constructed at intervals determined by the EI where surface drainages parallel the trenchline. In addition, trench breakers will be installed at the base of steep slopes adjacent to waterbodies.

Recontouring and Slope Reduction

Special attention will be given to shaping the construction right-of-way to direct runoff into existing drainages off the right-of-way. Cut and fill slopes will have the slope reduced to 3:1 or 4:1 ratio, or to match the adjacent utility right-of-way, to aid in reclamation and stabilization. If necessary, energy dissipation devices may be installed at the bases of cut and fill slopes to prevent scour in adjacent steep banks not located in the construction right-of-way.

4.2.4 Permanent Slope Breakers

Permanent slope breakers will be installed near the top of a slope, typically within 10 to 30 feet of the crest of a slope, to act as a reference point for spacing the remaining breakers. Spacing of the remaining breakers will be determined by the EI. When deciding on the placement interval of permanent slope breakers, the EI will attempt to match them to breakers located on adjacent rights-of-way, where applicable.

Where the ground surface is naturally rocky and resistant to erosion, permanent breakers may be omitted or the spacing increased at the discretion of the EI.

4.2.5 Rock Mulch

Rock mulch will be used to control erosion in areas that have a native gravel, cobble, boulder, or bedrock surface. Rock salvaged and stockpiled from these areas during construction will be distributed over the construction right-of-way during restoration and seeded with broadcast seeder. The gaps in the rocks will provide a microenvironment beneficial to seed germination by allowing moisture to collect and provide protection from wind. A rock cover will also blend the construction right-of-way into undisturbed areas.

4.2.6 Pocking

In some instances, mulch and erosion control fabrics may not be used. In many areas where slope is 10 percent or greater, CEBCS will utilize a technique called "pocking." Pocking creates a seedbed which is conducive to the establishment of permanent vegetative cover that will stabilize steep areas, provide forage for wildlife, and create an aesthetically compatible reclaimed right-of-way to that of adjacent areas. Pocking will involve creating a series of regularly spaced depressions, or mini terraces, using a backhoe. The depressions are the width of a standard backhoe bucket and are approximately 8-inches to 12-inches in depth.

The small depressions retain water runoff, creating a more mesic site to facilitate seed germination and subsequent seedling establishment. They will also minimize the potential for rill and gullies to form by diverting runoff and retaining a large portion of collecting precipitation. The depressions are offset from one another in order to minimize the potential that lower terraces would fail should a terrace above it fail. Where pocking is used, permanent slope breakers will not be used.

4.3 Waterbody Crossing

The following provisions will apply to waterbody crossings throughout the project.

4.3.1 Definitions

Waterbodies in the project area were delineated and classified as one of four types, ephemeral, intermittent, perennial, and spring. Ephemeral waterbodies are waterbodies that flow only in direct response to precipitation and are often called dry washes. Intermittent waterbodies are waters that flow only at certain times of the year when it receives water from springs or from some other source such as snowmelt. Waterbodies that flow continuously, usually from a groundwater source, are perennial waterbodies.

4.3.2 Notification

No potable surface water supply intakes have been identified within 3 miles downstream of any waterbodies crossings. Therefore, no notifications of construction in waterbodies will be required.

4.3.3 Installation

A total of 61 waterbodies occur within the construction right-of-way of the Bear Den Project: 1 spring, 24 perennial waterbodies, 35 intermittent waterbodies, and 1 ephemeral waterbody. If the waterbodies are dry when crossed, CEBCS proposes to use conventional upland cross-country construction techniques. If the waterbodies are flowing when crossed, CEBCS proposes to use the open-cut crossing method. Additionally, 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. Of these planned HDD crossings, 11 waterbodies will require a 15-foot-wide access path/temporary crossing to allow for construction equipment access to remote portions of the construction right-of-way that cannot be accessed by any other reasonable means.

Table 4.3.3-1 identifies all waterbodies crossed by type, location, and proposed crossing method.

TABLE 4.3.3-1

Bear Ben Project
Waterbody Crossing Table

Line	Milepost	Waterbody ID	Waterbody Type	Waterbody Name	Crossing Method
AR	6.0	s-mc-c-007	Intermittent	Rough Creek	HDD
AR-15	0.3	s-du-b-009	Intermittent	unnamed drainage	HDD*
AR-16	0.2	s-mc-b-012	Perennial	Spring Creek	HDD
AR-17	0.1	s-du-b-019	Intermittent	unnamed drainage	Open-cut
AR-17	0.3	s-du-b-018	Perennial	unnamed drainage	Open-cut
AR-19	0.4	sp-du-b-001	Spring	unnamed drainage	HDD
AR-19	0.5	s-du-b-015b	Intermittent	unnamed drainage	Open-cut
AR-20	0.2	s-du-b-038	Intermittent	unnamed drainage	HDD
AR-20	0.5	s-du-b-037	Intermittent	unnamed drainage	Open-cut
AR-20	0.8	s-du-b-029	Perennial	Bear Creek	HDD
AR-20	0.9	s-du-b-030	Perennial	Bear Creek	HDD
AR-20	0.9	s-du-b-030	Perennial	Bear Creek	HDD
AR-21	0.1	s-du-b-042	Perennial	unnamed drainage	HDD*
AR-22	0.4	s-du-b-013	Perennial	unnamed drainage	HDD
AR-24	0.9	s-mc-c-001a	Intermittent	Lone Beaver Creek	HDD
AR-24	0.9	s-mc-c-001a	Intermittent	Lone Beaver Creek	HDD
AR-24	0.9	s-mc-c-001a	Intermittent	Lone Beaver Creek	HDD
AR-24	1.0	s-mc-c-001a	Intermittent	Lone Beaver Creek	HDD
AR-25	1.2	s-mc-c-009	Perennial	Cherry Creek	HDD
AR-25	3.1	s-mc-c-004	Perennial	Cherry Creek	HDD*
AR-26	0.9	s-du-b-016a	Perennial	unnamed drainage	Open-cut
AR-26	1.7	s-du-b-020	Perennial	unnamed drainage	Open-cut
AR-27	2.8	s-mc-c-001b	Intermittent	Lone Beaver Creek	HDD
AR-30	0.04	s-du-b-014	Intermittent	unnamed drainage	HDD
AR-30	2.5	s-du-b-040	Intermittent	Tributary to LMR	HDD
AR-30	3.4	s-du-b-039a/b	Perennial	Little Missouri River	HDD
AR-30	4.6	s-du-b-031	Perennial	unnamed drainage	HDD
AR-30	4.7	s-du-b-032	Intermittent	Tributary to Bear Creek	HDD
AR-30	4.8	s-du-b-033a	Intermittent	Bear Creek	Open-cut
AR-30	4.8	s-du-b-033a	Intermittent	Bear Creek	Open-cut
AR-30	4.9	s-du-b-034	Perennial	Bear Creek	HDD*
AR-30	5.3	s-du-b-036	Intermittent	Tributary to Bear Creek	HDD*
AR-30	5.3	s-du-b-035	Perennial	Bear Creek	HDD*
AR-30	5.4	s-du-b-036	Intermittent	Tributary to Bear Creek	Open-cut
AR-30	5.7	s-du-b-026	Perennial	Bear Creek	HDD*
AR-30	6.0	s-du-b-045	Perennial	Bear Creek	HDD
AR-30	6.1	s-du-b-045	Perennial	Bear Creek	HDD
AR-30	6.3	s-du-b-028	Intermittent	Tributary to Bear Creek	Open-cut
AR-30	6.5	s-du-b-022	Intermittent	unnamed drainage	HDD*
AR-30	6.8	s-du-b-023	Intermittent	unnamed drainage	HDD*
AR-30	6.8	s-du-b-023	Intermittent	unnamed drainage	HDD*
AR-30	6.9	s-du-b-024	Perennial	unnamed drainage	Open-cut
AR-30	7.2	s-du-b-025	Intermittent	unnamed drainage	HDD
AR-30	11.5	s-du-b-007a/b	Perennial	Little Missouri River	HDD
AR-31	0.1	s-mc-c-005	Intermittent	tributary to Cherry Creek	HDD
AR-31	0.9	s-mc-c-006	Intermittent	unnamed drainage	HDD
AR-31	4.2	s-mc-b-008a/b	Perennial	Cherry Creek	HDD

TABLE 4.3-1 (cont'd)

Bear Ben Project
Waterbody Crossing Table

Line	Milepost	Waterbody ID	Waterbody Type	Waterbody Name	Crossing Method
AR-31	4.6	s-mc-c-011	Intermittent	Rough Creek	HDD*
AR-31	5.3	s-mc-c-010	Ephemeral	tributary to Cherry Creek	Open-cut
AR-31	7.9	s-du-b-001	Perennial	unnamed drainage	Open-cut
AR-31	9.0	s-du-b-002	Intermittent	Tributary to LMR	HDD
AR-31	9.1	s-du-b-003	Intermittent	tributary to LMR	HDD
AR-31	9.2	s-du-b-004	Perennial	tributary to LMR	HDD
AR-31	9.7	s-du-b-005	Perennial	unnamed drainage	Open-cut
AR-34	0.5	s-du-b-008	Intermittent	unnamed drainage	Open-cut
AR-34	1.2	s-du-b-010	Intermittent	unnamed drainage	Open-cut
AR-34	1.9	s-du-b-012	Intermittent	unnamed drainage	Open-cut
AR-34	2.6	s-du-b-011	Intermittent	unnamed drainage	HDD
PA1-AR-23	NA	s-du-b-006	Intermittent	unnamed drainage	Access Road Crossing
PA1-AR-30	NA	s-du-b-021	Perennial	Bear Creek	Access Road Crossing
PA4-AR-30	NA	s-du-b-040	Intermittent	unnamed drainage	Access Road Crossing

*HDD with temporary 15-foot travel lane

ATWS areas will typically be required on both sides of waterbody crossings to stage construction equipment, fabricate pipe, and store materials. These additional temporary workspace areas will generally be located at least 50 feet away from the water's edge.

4.3.4 Equipment Bridges

Where construction equipment access across a waterbody is required, temporary bridges will be installed across waterbodies that are flowing, or contain standing water, at the time of construction. With the exception of the initial clearing equipment, which will be allowed one pass through a waterbody within a 15-foot corridor, and that needed to install equipment bridges, only the equipment necessary for instream excavation and backfilling will be allowed in the stream channel. Other construction equipment will cross waterbodies on temporary equipment bridges. Bridges will be removed as soon as possible after reclamation.

Bridges will be designed to withstand the highest flow of a given waterbody. Equipment bridges will typically consist of prefabricated construction mats (see POD Appendix C for typical bridge layout), although other options such as rail flat cars placed over the waterbody, with or without a culvert, may also be utilized. The Contractor will be responsible for maintaining any bridges built so as to prevent soils from entering the waterbody.

In instances where permanent access roads cross waterbodies, at-grade, low water crossings will be installed to provide operational equipment and vehicles with permanent access.

4.3.5 Open-Cut Crossing Method

For open-cut crossings, clearing adjacent to waterbodies will involve the removal of trees and brush from the construction right-of-way and additional temporary workspace areas. Woody vegetation within the construction right-of-way will be cut at ground level and cleared to the edge of the waterbody. To avoid excessive disruption of wetland soils and the native seed and rootstock within the waterbody soils, stump removal, grading, topsoil segregation, and excavation will be limited to the area immediately over the trenchline. A limited amount of

stump removal and grading may be conducted in other areas if dictated by safety-related concerns. Sediment barriers may be installed at the top of the streambank if no herbaceous strip exists. Initial grading of the herbaceous strip will be limited to the extent needed to create a safe approach to the waterbody and to install a bridge.

During clearing, sediment barriers will be installed and maintained across the right-of-way adjacent to a waterbody and within ATWS areas to minimize the potential for sediment runoff. Silt fence and/or straw bales located across the working side of the right-of-way will be removed during the day when vehicle traffic is present and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the access path in lieu of silt fence and/or straw bales.

Once the trench is excavated, the prefabricated segment of pipe will be installed in the trench. Most pipe installed under a waterbody will be coated with concrete or equipped with set-on weights to provide negative buoyancy. The trench will then be backfilled with native streambed spoil. CEBCS will attempt to complete all instream work within 24 hours for all ephemeral and intermittent waterbodies crossings and within 48 hours for perennial waterbody crossings.

Sediment Control

Silt fence, or equivalent, will be installed and anchored along the banks of waterbodies. Sediment control devices will be maintained until revegetation of adjacent areas is considered successful or the area is stabilized. Permanent diversion berms will be constructed at the base of slopes near waterbodies, unless otherwise specified by the EI.

Trench Plugs

Earthen trench plugs will be left in place on both banks of the waterbody until immediately before pipe installation. This will separate the waterbody trench from the upland trench to prevent water from being diverted into the upland portions of the pipelines' trench and to keep muddy water that accumulates in the upland trench from flowing into the waterbody.

Pipeline Burial Depth

The pipelines will be installed at a depth below the bed of washes and wetlands that is consistent with DOT pipeline design and operating standards, to prevent exposure of the pipelines and maintain the integrity of the system in event of a flash flood.

Backfill Material

Excavated material will be used for trench backfill in perennial streams and dry washes, unless expressly permitted otherwise by the regulatory agency. Backfilling will begin as soon as practical after installation of the pipe and reestablishment of the streambanks.

If blasting is required for installation in a waterbody, the trench will be backfilled with native rock that was removed during blasting activities.

Streambed and Bank Stabilization

Original channel configurations will be reestablished, and the banks replaced, compacted, and restored to the original condition. Banks may be graded to a more stable configuration if eroding or unstable conditions were present prior to construction.

To provide additional erosion control, CEBCS will use erosion control fabrics (*e.g.*, jute matting, straw blankets with plastic netting, or curlex) on the banks of washes and waterbodies where steep slopes and a minimum of natural rock are present. A permanent slope breaker will be installed at the base of any slope leading to a waterbody.

If required, CEBCS will install temporary fences at the edges of waterbodies to prevent grazing cattle from disturbing the area before a mature vegetative cover is established.

The banks of perennial streams will be seeded with western wheatgrass (*Pascopyrum smithii*) at a rate of 40 pounds per acre to provide temporary cover while allowing native herbaceous and woody vegetation to become re-established without excessive competition. Lime, mulch, and fertilizer will not be used in these locations. Dry wash bottoms will not be seeded.

4.3.6 Dry Crossing Methods

Although dry crossing methods are not proposed for the Project, they may be considered if warranted by site-specific conditions encountered at the time of construction. Dry crossing methods may include the flume method and the dam and pump method.

The flume crossing method involves temporarily directing the stream flow through one or more flume pipes that are placed over the area to be excavated. This method allows for trenching activities to occur under relatively dry conditions beneath the flume pipes, avoiding disruption to water flow. With this method, stream flow is directed through the flumes by constructing two bulkheads, which may consist of materials such as sand bags and plastic sheeting. Following completion of pipeline installation, backfill of the trench, and restoration of the stream banks, the bulkheads and flume pipes are removed.

The dam and pump crossing method involves installing temporary dams upstream and downstream of a waterbody crossing. The dams are typically constructed of sandbags and plastic sheeting. Following installation of the dams, appropriately sized pumps are used to dewater the excavation area and to transport the stream flow around the construction work area. Intake screens are installed at the pump inlets to prevent entrainment of aquatic organisms, and energy-dissipating devices are installed at the pump discharge point to minimize erosion and stream bed scour. Trench excavation and pipeline installation then take place in the dewatered portion of the waterbody channel. Following completion of pipeline installation, backfill of the trench, and restoration of stream banks, the temporary dams are removed, and flow through the construction work area restored.

4.3.7 Horizontal Directional Drill Method

A number of waterbodies will also be crossed using the HDD installation method. Specifically, CEBCS proposes to use the HDD method at 40 locations as identified in table 4.3-1. HDD is a trenchless crossing method that is typically used to avoid direct impacts to sensitive resources (e.g., waterbodies and wetlands) or infrastructure (e.g., roads and railways) by directionally drilling beneath them and installing the pipeline in the subsurface bore. Where HDD is proposed, the crude oil and produced water pipelines will be installed via separate, parallel HDDs (i.e., each pipeline will be installed in an individual bore)

The first step of HDD will be to drill a small-diameter pilot hole from one side of the crossing (entry side) to the other (exit side). Drilling will be achieved using a powered drill bit. The drilling fluid, commonly referred to as mud, will be a mixture of water and bentonite (a naturally occurring clay mineral), which will be pumped into the drill hole through the drill pipe during the drilling process. The pressure of the drilling mud will transmit hydraulic power through the drill

bit, transport cuttings to the surface, lubricate the drill bit, and stabilize the drill hole. Water, the main ingredient of drilling mud, will be obtained from the waterbody during drilling or will be trucked in from another source. Small pits will be dug at or near the entry and exit holes to temporarily store the mud and cuttings. The mud and cuttings will be pumped from the temporary storage pits to an on-site recycling unit where the bentonite clay will be processed for reuse.

As drilling of the pilot hole progresses, segments of drill pipe will be inserted into the pilot hole to extend the length of the drill across and under the waterbody. The drill bit will be steered and monitored throughout the process to maintain the designated path of the pilot hole. To assist in steering, a sensor grid may be established on the surface on both the entry and exit sides of the horizontal directional drill. The sensor grid will be fabricated by installing several stakes along and above the drill path and wrapping with an insulated coil wire. The coil wire will be then energized with a portable generator, which creates a magnetic field to help track the drill bit path.

Once the pilot hole is complete, the sensor grid will be removed and the hole will be enlarged to accept the pipeline. To enlarge the pilot hole, a larger reaming tool will be attached to the end of the drill pipe on the exit side of the hole. The reamer will then be drawn back through the pilot hole to the drill rig (entry side). Drill pipe sections will be added to the rear of the reamer as it progresses toward the rig, thereby allowing a string of drill pipe to remain in the hole at all times. Typically, several passes of consecutively larger reaming tools are required before the hole will be of sufficient size. The final hole will be approximately 1½ times larger than the pipeline to be installed.

The pipeline segment to be installed beneath the waterbody will be fabricated into one section on the right-of-way on the exit side of the crossing. The pipe segment will be radiographically inspected and/or hydrostatically tested prior to installation. After the hole is completed, the pipeline segment will be attached to the drill pipe on the exit side of the hole and pulled back through the drill hole toward the drill rig.

Once the pipeline is installed, excess drilling mud will be collected and disposed of at an appropriate facility. If water will be left over from the drilling process, it will be discharged into a well-vegetated upland area or into an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale dewatering structure at the site.

Typically, horizontal directional drilling involves no disturbance to the bed or bank of the waterbody being crossed. However, if a natural fracture or void in the ground is encountered, an unexpected release of drilling mud to the surface could occur. Unconsolidated gravel, coarse sand, and fractured bedrock all present circumstances that increase the likelihood of drilling mud releases. These areas present paths that can run laterally or vertically. If drilling mud moves laterally, the release may not be evident on the ground. For a release to be evident there must be a flow path extending vertically from the drill hole to the surface. The volume of mud released will be dependent on a number of factors, including the size of the fault, the permeability of the geologic material, the viscosity of the drilling mud, and the pressure of the hydraulic drilling system.

Releases to surface generally occur above or near the drill path. If a wetland or waterbody is present, drilling mud could be released into the wetland or waterbody. In the event drilling mud is released on surface, including within a wetland it will be contained with straw bales, silt fence, or berms. A small pit may be dug at the release site to contain its spread, and a pump will be used to transfer the drilling mud from the pit and into a containment vessel.

A drilling mud release to a waterbody will be more difficult to contain because mud is quickly dispersed into the water and carried downstream. In the event of a release to a waterbody, an attempt may be made to plug the fault by lowering the drilling pressure and thickening to the drilling mud, with additional bentonite, or other non-hazardous materials that are compatible with the drill equipment being used.

The *Horizontal Directional Drill and Contingency Plan* included as POD Appendix G describes the prevention, detection, monitoring, notification, and corrective action procedures in the event of an inadvertent release of drilling fluid during an HDD.

Because of access restrictions and the remoteness of portions of the right-of-way, there will be a need for construction equipment access through approximately 11 of the HDD waterbody crossing locations. Specifically, where there are no alternative means of ingress/egress to the right-of-way except through the HDD locations, CEBCS will require a 15-foot travel lane through the HDD locations to allow construction equipment access to remote right-of-way. CEBCS will cut vegetation to ground level, only removing stumps as necessary for safety, and laying mats as needed to safely travel through these areas.

4.4 Wetland Crossings

A total of 69 wetlands occur within the construction right-of-way for the Bear Den Project: 64 palustrine emergent wetlands (PEM), 2 palustrine shrub-scrub wetlands, and 3 palustrine forested wetlands. CEBCS plans to cross a total of 45 wetlands using the HDD crossing technique and 24 wetlands using modified conventional upland cross-country technique to reduce the potential for pipeline construction to affect wetland hydrology and soil structure. A 15-foot-wide access path will be required through 13 of the HDD locations to allow for construction equipment access to remote portions of the right-of-way that cannot be accessed by any other reasonable means. These paths will be cleared of vegetation as necessary to allow safe passage of equipment and personnel. In addition, there are wetlands present along some of the proposed access roads; however, these are existing roads that will not require improvements, thus no impacts are anticipated to these wetlands.

CEBCS will use a 75-foot-wide construction right-of-way through wetlands where there are co-located pipelines and a 60-foot-wide construction right-of-way through wetlands where a single pipeline is proposed. ATWS areas will be required on both sides of some wetlands to stage construction, fabricate the pipelines, and store materials. Where feasible, additional temporary workspace areas will be located in upland areas a minimum of 50 feet from the wetland edge. Construction equipment working in wetlands will be limited to that essential for right-of-way clearing, excavating the trench, fabricating and installing the pipelines, backfilling the trench, and reclaiming the right-of-way.

In areas where there is no reasonable access to the right-of-way except through wetlands, construction equipment will be allowed to travel through only if the ground is firm enough or has been stabilized (e.g., with timber mats) to avoid rutting. As discussed in Section 4.3.7, construction equipment will require access to portions of the right-of-way with limited to no access other than through HDD locations. Specifically, access will be required through 13 wetland crossings that are being HDD. Construction equipment will cross through the wetlands within a 15-foot travel lane, utilizing mats where appropriate. The remaining 32 HDD wetland crossings CEBCS will avoid crossing the wetland with construction equipment.

Clearing of vegetation in wetland rights-of-way will be limited to trees and shrubs, which will be cut flush with the surface of the ground and removed from the wetland. Where HDD methods

will be used and where it is necessary to cross within the wetland first, clearing of shrubs and trees will be limited to the 15-foot travel lane. To avoid excessive disruption of wetland soils and the native seed and rootstock within the wetland soils, stump removal, grading, topsoil segregation, and excavation will be limited to the area immediately over the trenchline. A limited amount of stump removal and grading may be conducted in other areas if dictated by safety-related concerns. Topsoil segregation over the trenchline will only occur if the wetland soils are not saturated at the time of construction.

During clearing, sediment barriers, such as silt fence and staked straw bales, will be installed and maintained adjacent to wetlands and within additional temporary workspace areas as necessary to minimize the potential for sediment runoff. Sediment barriers will be installed across the full width of the construction right-of-way at the base of slopes adjacent to wetland boundaries. Silt fence and/or straw bales installed across the working side of the right-of-way will be removed during the day when vehicle traffic is present and will be replaced each night. Alternatively, drivable berms may be installed and maintained across the access path in lieu of silt fence or straw bales. Sediment barriers will also be installed within wetlands along the edge of the right-of-way to minimize the potential for sediment to run off the construction right-of-way and into wetland areas outside the work area. If trench dewatering is necessary in wetlands, silt-laden trench water will be discharged through an energy dissipation/sediment filtration device, such as a geotextile filter bag or straw bale structure, to minimize the potential for erosion and sedimentation.

The method of pipeline construction used in wetlands will depend largely on the stability of the soils at the time of construction. If wetland soils are not excessively saturated at the time of construction and can support construction equipment on equipment mats, timber riprap, or straw mats, construction will occur in a manner similar to conventional upland cross-country construction techniques. In unsaturated wetlands, topsoil from the trenchline will be stripped and stored separately from subsoil. Topsoil segregation generally will not be possible in saturated soils.

Where wetland soils are saturated and/or inundated, the pipelines may be installed using the push-pull technique. The push-pull technique will involve stringing and welding the pipelines outside of the wetland and excavating and backfilling the trench using a backhoe supported by equipment mats or timber riprap. The prefabricated pipelines will be installed in the wetland by equipping it with buoys and pushing or pulling it across the water-filled trench. After the pipeline is floated into place, the floats will be removed and the pipeline will sink into place. Most pipe installed in saturated wetlands will be coated with concrete or equipped with set-on weights to provide negative buoyancy.

Because little or no grading will occur in wetlands, restoration of contours will be accomplished during backfilling. Prior to backfilling, trench breakers will be installed where necessary to prevent the subsurface drainage of water from wetlands. Where topsoil has been segregated from subsoil, the subsoil will be backfilled first, followed by the topsoil. Topsoil will be replaced to the original ground level leaving no crown over the trenchline. In some areas where wetlands overlie rocky soils, the pipe will be padded with rock-free soil or sand before backfilling with native bedrock and soil. Equipment mats, timber riprap, gravel fill, geotextile fabric, and/or straw mats will be removed from wetlands following backfilling. Table 4.4-1 identifies all wetland crossed by type, acres, location and proposed crossing method.

TABLE 4.4-1

Bear Den Project
Wetland Crossing Method and Construction Impacts

Line	Milepost In	Milepost Out	Wetland ID	Wetland Type	Crossing Method [b]	Area Within the Temporary Construction Right-of-Way (acres)	Area Within the Permanent Easement (acres)	Total Construction Disturbance (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	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	0.3	0.4	w-du-b-014[a]	PEM	Open-cut	0.01	0.00	0.01
AR-19	0.1	0.2	w-du-b-011	PEM	HDD	0.00	0.00	0.00
AR-20	0.8	0.8	w-du-b-018a	PEM	HDD	0.00	0.00	0.00
AR-20	0.8	0.8	w-du-b-018b	PEM	HDD	0.00	0.00	0.00
AR-20	0.8	0.8	w-du-b-018c	PEM	HDD	0.00	0.00	0.00
AR-20	0.9	0.9	w-du-b-018d	PEM	HDD	0.00	0.00	0.00
AR-20	0.9	0.9	w-du-b-018e	PEM	HDD	0.00	0.00	0.00
AR-20	0.9	0.9	w-du-b-018f	PEM	HDD	0.00	0.00	0.00
AR-21	0.1	0.1	w-du-b-021a	PEM	HDD[b]	0.01	0.00	0.01
AR-21	0.1	0.1	w-du-b-021b	PEM	HDD[b]	0.01	0.00	0.01
AR-22	0.8	0.8	w-du-b-010	PEM	HDD	0.00	0.00	0.00
AR-23	0.5	0.5	w-du-b-006	PEM	Open-cut	0.02	0.03	0.05
AR-24	0.9	0.9	w-mc-c-001a	PEM	HDD	0.00	0.00	0.00
AR-24	0.9	0.9	w-mc-c-001b	PEM	HDD	0.00	0.00	0.00
AR-24	0.9	0.9	w-mc-c-001c	PEM	HDD	0.00	0.00	0.00
AR-24	0.9	0.9	w-mc-c-001d	PEM	HDD	0.00	0.00	0.00
AR-24	0.9	1.0	w-mc-c-001f	PEM	HDD	0.00	0.00	0.00
AR-24	0.9	1.0	w-mc-c-001g	PEM	HDD	0.00	0.00	0.00
AR-24	1.0	1.0	w-mc-c-001h	PEM	HDD	0.00	0.00	0.00
AR-24	1.1	1.1	w-mc-c-006c	PEM	HDD	0.00	0.00	0.00
AR-25	1.6	1.7	w-mc-b-005	PEM	Open-cut	0.21	0.18	0.39
AR-25	3	3	w-mc-c-007	PEM	HDD	0.00	0.00	0.00
AR-25	0.5	0.5	w-mc-c-011a	PEM	HDD[b]	0.02	0.00	0.02
AR-25	0.8	0.8	w-mc-c-012a	PEM	HDD[b]	0.02	0.00	0.02
AR-25	1.0	1.0	w-mc-c-012b	PEM	Open-cut	0.02	0.02	0.04
AR-25	1.2	1.2	w-mc-c-013a	PEM	HDD	0.00	0.00	0.00
AR-25	1.2	1.2	w-mc-c-013b	PEM	HDD	0.00	0.00	0.00
AR-26	0.2	0.6	w-du-b-013a	PEM	Open-cut	1.23	0.91	2.14
AR-26	0.9	0.9	w-du-b-013b	PEM	Open-cut	0.01	0.06	0.07
AR-26	1.0	1	w-du-b-014[a]	PEM	Open-cut	0.01	0.01	0.02
AR-29	2	2	w-du-b-023a	PEM	Open-cut	0.00	0.04	0.04
AR-29	1.9	1.9	w-du-b-023b	PEM	Open-cut	0.00	0.00	0.00
AR-29	1.8	1.8	w-du-b-024	PEM	Open-cut	0.00	0.05	0.05
AR-29	1.6	1.7	w-du-b-025	PEM	HDD[b]	0.08	0.00	0.08
AR-30	9.4	9.4	w-du-b-015a	PEM	Open-cut	0.12	0.21	0.33
AR-30	6.8	6.8	w-du-b-016a	PEM	HDD[b]	0.01	0.00	0.01
AR-30	6.9	6.9	w-du-b-016b	PEM	Open-cut	0.01	0.00	0.01
AR-30	7.2	7.2	w-du-b-017	PEM	HDD	0.00	0.00	0.00
AR-30	5.1	5.1	w-du-b-019a	PEM	Open-cut	0.02	0.06	0.08
AR-30	5.1	5.1	w-du-b-019b	PEM	Open-cut	0.00	0.00	0.00
AR-30	4.8	4.8	w-du-b-018g	PEM	HDD[b]	0.01	0.00	0.01

TABLE 4.4-1 (cont'd)

Bear Den Project
Wetland Crossing Method and Construction Impacts

Line	Milepost In	Milepost Out	Wetland ID	Wetland Type	Crossing Method [b]	Area Within the Temporary Construction Right-of-Way (acres)	Area Within the Permanent Easement (acres)	Total Construction Disturbance (acres)
AR-30	3.7	3.7	w-du-c-003a	PEM	HDD[b]	0.11	0.00	0.11
AR-30	3.7	3.8	w-du-c-003b	PEM	HDD[b]	0.02	0.00	0.02
AR-30	3.8	3.8	w-du-c-003c	PEM	HDD[b]	0.05	0.00	0.05
AR-31	6.7	6.7	w-du-b-001	PEM	Open-cut	0.04	0.10	0.14
AR-31	6.4	6.5	w-du-b-002	PEM	Open-cut	0.03	0.12	0.15
AR-31	4.2	4.2	w-mc-b-004g	PEM	HDD	0.00	0.00	0.00
AR-31	4.2	4.2	w-mc-b-004h	PEM	HDD	0.00	0.00	0.00
AR-31	4.3	4.4	w-mc-b-010a	PEM	Open-cut	0.01	0.01	0.02
AR-31	2.6	2.6	w-mc-c-002b	PEM	HDD	0.00	0.00	0.00
AR-31	0.1	0.1	w-mc-c-008	PEM	HDD	0.00	0.00	0.00
AR-31	2.3	2.3	w-mc-c-009	PEM	Open-cut	0.01	0.00	0.01
AR-31	2.3	2.3	w-mc-c-010a	PEM	Open-cut	0.01	0.01	0.02
AR-31	2.3	2.3	w-mc-c-010b	PEM	Open-cut	0.01	0.00	0.01
AR-34	2.6	2.6	w-du-b-009a	PEM	HDD	0.00	0.00	0.00
AR-34	2.6	2.6	w-du-b-009b	PEM	HDD	0.00	0.00	0.00
AR-34	2.6	2.6	w-du-b-009c	PEM	HDD	0.00	0.00	0.00
AR-34	2.5	2.5	w-du-b-009d	PEM	Open-cut	0.01	0.02	0.03
AR-35	0.3	0.4	w-mc-b-007	PEM	HDD	0.00	0.00	0.00
AR-35	0.6	0.6	w-mc-b-008	PEM	HDD[b]	0.05	0.00	0.05
AR-30	11.4	11.4	w-du-b-012	PFO	HDD	0.00	0.00	0.00
AR-30	3.7	3.7	w-du-c-004a	PFO	HDD[b]	0.02	0.00	0.02
AR-30	3.8	3.8	w-du-c-004b	PFO	HDD[b]	0.02	0.00	0.02
AR-31	6.2	6.3	w-du-b-003	PSS	Open-cut	0.27	0.28	0.55
AR-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 crossed by two pipelines, Lines AR-17 and AR-26
[b] HDD requires temporary 15-foot travel lane

Where wetlands are located at the base of slopes, permanent slope breakers will be constructed across the right-of-way in upland areas adjacent to the wetland boundary. Temporary sediment barriers will be installed where necessary until revegetation of adjacent upland areas is successful. Once revegetation is successful, sediment barriers will be removed from the right-of-way and disposed of properly.

In wetlands, western wheatgrass will be planted at a rate of 40 pounds per acre to provide temporary cover while allowing native herbaceous and woody vegetation to become re-established without excessive competition. Lime, mulch, and fertilizer will not be used in wetlands.

4.5 Blasting

No blasting is anticipated for this Project; however, blasting may be necessary as a last resort in areas where competent shallow bedrock or boulders are encountered that cannot be removed by conventional excavation with a trackhoe trencher, ripping with a bulldozer followed by

trackhoe excavation, or hammering with a trackhoe-attached device (hoe-ram) followed by excavation. See Appendix O of the POD for CEBCS' *Blasting Plan*.

4.6 Residential Construction

Based on an aerial review of the project, no residences are located within 300 feet of the proposed project area; thus, no special residential construction techniques are anticipated to be needed.

4.7 Rangeland Construction

The Project will cross grazing leases on federal lands. Each fence crossed by construction crews will be braced and secured to prevent slacking of the wire. The opening created will be closed when construction crews leave the project area to prevent passage of livestock. Any gaps in natural barriers used for livestock control created by construction activity will be fenced according to landowner or lease holder.

All existing improvements, such as fences, gates, irrigation ditches, cattle guards and reservoirs will be maintained during construction and repaired to pre-construction conditions or better, if affected by construction activity.

4.7.1 Grazing Mitigation

To protect livestock on rangeland, CEBCS will install trench plugs across the pipeline trench where it crosses livestock trails, and ramps will be installed to allow for the escape of livestock should they fall into the trench. CEBCS will leave gaps between strung sections of pipe about every 0.5 mile or wherever there is a feature crossing (e.g., waterbody, road, utility), or where identified by the EI to allow livestock to pass between long, continuous sections prior to pipe lowering in.

CEBCS will work with landowners to discourage livestock grazing of the construction right-of-way during the first growing season by utilizing temporary fencing, deferred grazing agreements, or increased grazing rotation frequency.

4.8 Waterlines

If construction damage to water pipelines occurs, repairs will be made according to landowner's or lease holder's specifications. If needed, an emergency source of potable water for livestock will be provided by CEBCS.

In the event that CEBCS severs a waterline, the line will be repaired to at least equal or better quality compared to its pre-construction condition. In most cases, CEBCS will be able to place the Project pipeline(s) underneath the waterline. In instances where the waterline requires cutting or is accidentally severed, the line will be braced on both sides of the affected area near the edges of CEBCS' pipe trench to cut off water flow. Once the pipe is laid in the trench, a new section of waterline will be placed in the gap. The waterline will be installed back to its original burial depth with at least 6-inches of clearance between the waterline and the newly installed pipelines. Alternate water sources will be provided for livestock during this period in consultation with the leaseholder or waterline owner.

4.9 Dust Control

Wind has been identified as having a potential for causing soil erosion during construction of the Project. Fugitive dust emissions will be primarily caused by increased traffic on dirt roads and the construction right-of-way. When construction activities are in the vicinity of major roadways, such that fugitive dust plumes could create a safety hazard for traffic, construction activity shall cease until water trucks can control the dust. The EI will direct application of necessary dust controls.

In general, fugitive dust emissions from the construction right-of-way will be mitigated through efforts to complete construction and restoration as expeditiously as possible. Efforts will be made to complete final reclamation and cleanup of a disturbed area within 20 days after backfilling operations, with seeding of disturbed areas to follow rapidly thereafter, weather and soil conditions permitting. During active construction, fugitive dust from both access roads and the construction right-of-way itself will primarily be controlled using water.

Water will be applied to the access roads, contractor yard, and right-of-way using a rear spraying water truck or other suitable means. The frequency of water application will largely depend on weather conditions, but in general it is anticipated that approximately 6,000 gallons per day per linear mile of access road and right-of-way will be required.

To minimize wind erosion and fugitive dust emissions during construction, CEBCS will implement the following Reasonably Available Control Measures:

- Disturb no more earth than required for construction to occur;
- Water the right-of-way, laydown areas, and temporary roads in areas of active construction, if necessary and as determined by the EI. If soils are puverized greater than 2 inches deep in active areas, watering will be required as frequently as necessary to control dust. Water for dust control will be obtained from municipal sources;
- Control project-related traffic speeds on dirt access roads, the construction right-of-way, and other linear facility rights-of-way;
- Mandatory speed limits of 25 miles per hour will be enforced on unimproved dirt roads or otherwise will be determined by the occupying property owner on private lands and by the county on public roads (e.g., posted speed limits);
- Speed limits will decrease when excessive winds prevail and where sensitive areas, such as public roads, may be adjacent to access roads or the right-of-way; and
- Temporarily stockpiled soils will be watered as necessary, to create a semi-hard protective layer to minimize wind erosion if necessary, as determined by the EI. This treatment would occur once after the trench has been excavated. Topsoil piles will also be watered as soon as the right-of-way is graded and the topsoil is segregated.

4.10 Fire Prevention and Suppression

The risk of fire danger during pipeline construction is related to smoking, spark arresters, catalytic converters, vehicle fires, welding, normal operation, and refueling of equipment. CEBCS and its construction contractors will prevent and suppress all fires in accordance with federal, state, and local regulations. Measures identified apply to work within the project area defined as the right-of-way, access roads, all work and storage areas, and other areas used during construction of the project. The measures described will be in effect from the beginning to the end of construction. Specifically, CEBCS will implement the following measures to prevent and suppress fires:

- A list of local fire authorities and their designated representative to contact shall be maintained on site by construction personnel;
- adequate firefighting equipment shall be available on site in accordance with the applicable regulatory requirements;
- the level of fire hazard shall be posted at the construction office (where visible for workers) and workers shall be made aware of the hazard level and related implications;
- the construction contractor shall provide equipment to handle any possible fire emergency. This shall include, although not be limited to, water trucks; portable water pumps; chemical fire extinguishers; hand tools such as shovels, axes, and chain saws; and heavy equipment adequate for the construction of fire breaks when needed;
- the construction contractor shall supply and maintain in working order an adequate supply of fire extinguishers for each crew engaged in potentially combustible work such as welding, cutting, grinding, and burning of brush or vegetative debris;
- in the event of a fire, construction contractor shall immediately use resources necessary to contain the fire, and the contractor shall simultaneously notify local emergency response personnel;
- all tree clearing activities shall be carried out in accordance with local rules and regulations for the prevention of forest fires;
- any burning shall be done in compliance with applicable state, county, or local regulations;
- any burning will be done within the right-of-way and ATWS. Only small piles shall be burned to avoid overheating or damage to trees or other structures along the right-of-way;
- flammable wastes shall be removed from the construction site on a regular basis;
- flammable materials kept on the construction site will be stored in approved containers away from ignition sources;

- smoking shall be prohibited around flammable materials;
- smoking shall be prohibited on the entire construction site when the fire hazard level is high; and
- all burning tobacco and matches will be extinguished before discarding.

5.0 ABOVEGROUND FACILITY CONSTRUCTION

The Bear Den POD contains detailed information on aboveground facility locations, dimensions, and land requirements. In general, typical construction activities will be similar for all aboveground facilities including the storage/transfer facility, crude oil delivery interconnect, two pig launcher/receiver sites, wellhead facilities, mainline valves, and the lateral interconnect sites. Typical construction activities will include general clearing and grading, installation of foundations, underground piping and utilities, and any control buildings or associated ancillary facilities as required.

5.1 Storage/Transfer Facility

The storage/transfer facility will not be located on federally-managed lands. Construction activities at the storage/transfer facility will include a standard sequence of activities. These include clearing and grading, installing foundations, underground piping and utilities, and control buildings and associated facilities. Appendix B of the POD shows the layout of the storage/transfer facility.

Construction activities and the storage of building materials will be confined to the facility construction sites to the extent practical. Additional material storage, if required, will be provided at two proposed pipe storage/contractor yards on non-federal land. Debris and wastes generated during construction will be disposed of appropriately, and surface areas disturbed will be restored in a timely fashion. Temporary portable sanitary facilities will be installed during construction. Solid wastes generated during construction will be disposed of in an approved manner, as will all cleaning fluids and other waste materials.

Typical construction activities that will be involved in the development of a storage/transfer facility are summarized below.

5.1.1 Clearing and Grading

The site for the transfer facility will be cleared of vegetation and graded as necessary to create a level surface for the movement of construction vehicles and to prepare the area for building and pad foundations. Silt fence and/or straw bales will be installed, after clearing is completed but prior to grading, where necessary to minimize soil runoff and sedimentation into adjacent roads, wetlands, waterbodies or other areas.

5.1.2 Foundations

Once the facility site has been graded, excavation will begin for installation of foundations and pipe supports. Excavation required for the foundations will be performed as needed, and all backfill will be compacted in place. Excess soil will be used either on site or disposed of in an approved area off site. The area for the foundations will be excavated and forms and reinforcing bars installed as necessary with high strength concrete poured to the appropriate

levels. Rigid controls on concrete quality and installation procedures will ensure a suitable foundation is obtained. The reinforced concrete foundations for the major equipment and tanks will be properly cured to ensure design strength, and concrete pours will be randomly sampled to verify compliance with specifications.

5.1.3 Underground Facilities and Utilities

Underground facilities will consist of buried station piping, buried electrical conduits and cable, and (at the storage/transfer facility) a sanitary septic system, a potable water well, and a closed drain system, with a below ground sump tank. Installation of the various piping systems will begin at about the same time as the foundation work. Trenches will be dug for the underground portions of the piping, the pipe will be welded, x-rayed, coated, placed in the trench, and backfilled. Some portions of the station piping will be installed aboveground. Any aboveground piping will be installed on concrete or metal pipe supports and painted. Some of the piping, valves, and fittings are typically fabricated off-site at the contractor's fabrication shop and then transported to the site.

Commercial power and telephone will be established at the site as soon as possible. CEBCS will contract with a third-party electric service provider to obtain delivery of metered electric power to the central storage/transfer facility. Although existing electric power lines adjoin the western side of the lot, it will be necessary to construct approximately 300 feet, of buried electric distribution line to provide power to the central storage/transfer facility.

5.1.4 Building and Storage Tank Design and Construction

Once the foundations have been completed and cured sufficiently, installation of the buildings and equipment will begin. This is a highly coordinated activity as the machinery, buildings, and piping are all installed during the same time period. To the extent compatible with Good Engineering Practice, the facilities will be architecturally designed (form) and painted (color) to be compatible with landscapes in the areas in which they are located. Additionally, CEBCS will consult with the BLM and other appropriate agencies to determine which additional aboveground facilities will require painting to minimize impacts to visual quality. The paint color will be determined after consultation with these agencies.

5.1.5 Commissioning

Commissioning involves activities to verify that all facility equipment is properly installed and working, the controls and communications systems are functional, and the transfer facility is ready for service.

5.1.6 Final Cleanup and Stabilization

After the completion of startup and testing, or as soon as weather permits thereafter, the facility sites will be final graded and landscaped.

A permanent security fence will be installed around the site. The access roads will also be final graded. Parking areas for vehicles will similarly be paved or graveled. Downward shield lighting, low profile lighting, or, motion lights may be installed.

The storage/transfer facility will be designed to be consistent with the character of the surrounding land uses (to the extent possible) and an extensive landscaping program is not planned.

5.2 Infrastructure Facilities

Construction and installation of other aboveground and infrastructure facilities (e.g., pig launcher/receiver facilities and intermediate block valve sites) will follow a similar construction sequence as the central storage/transfer facility. Specifically, construction and installation will include clearing and grading, preparing foundations, installation and erection of facilities, hydrostatic pressure testing, cleanup and stabilization, and installation of security fencing around the facilities. Block valve and launcher/receiver construction will generally be concurrent with the construction of the pipelines. Upon completion, disturbed areas will be stabilized with gravel within a fenced enclosure or by seeding with appropriate species outside the fence. On federal lands, the aboveground components of these facilities will be painted to blend the facilities in with surrounding vegetation and soils. The valves and launcher and/or receiver sites will typically be enclosed in a chain-link security fence or bull fence.

5.2.1 Crude Oil Delivery Interconnect

A pig receiver assembly will be constructed at the terminus of the crude oil delivery lateral pipeline (Line AR-16), which will be sited and constructed on a lot owned and developed by the third-party outlet pipeline. Appendix B of the POD shows the crude oil interconnect facilities

5.2.2 Pig Launcher and Receiver Sites

Two approximately 1.0 acre lots will be fenced and graveled and will each include pig launcher/receivers and automated block valves for both the crude oil and produced water gathering pipelines. Appendix B of the POD shows typical facility layouts for the pig launcher and receiver sites.

5.2.3 Wellhead Facilities

Wellhead facilities will include 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 with a 25-hp electric pump; pig launchers and block valves for both the crude oil and produced water pipelines; and associated piping. Appendix B of the POD shows typical wellhead facilities.

5.2.4 Block Valves and Lateral Interconnects

As part of construction of the pipelines, block valves will be installed at spacings that meet or exceed federal requirements, as defined by Title 49 CFR Part 195.260. Appendix B of the POD shows the layouts of a typical block valve site. The lateral interconnects will be constructed as depicted in the POD Appendix B.

6.0 RECLAMATION

6.1 Backfilling and Grading

To reduce the potential for erosion, proper compaction of the trench and grading would be completed prior to replacing topsoil. The backfill will be replaced to allow for normal settling over the trench. The disturbed areas would be restored to approximate the original contour of the land as closely as possible. This would include all non-essential access roads, hillsides, surface water drainages, and other areas where soil disturbance would occur.

Upon completion of grading and stabilization, disturbed areas would be inspected for slope stability, relief, topographic diversity, acceptable surface water drainage capabilities, and compaction. Trench breakers would be installed on steep slopes to prevent later surface erosion. Installation and spacing of the trench breakers are specified in Section 3.5.1 but may be adjusted by the EI, as determined on a site-specific basis.

6.1.1 Redistribution of Topsoil

Topsoil would be segregated and would not be mixed with spoil material before or during replacement. Only topsoil would be segregated and re-spread over the surface. Topsoil segregation benefits revegetation success as most plant-essential nutrients are found at or near the surface. Topsoil would not be used for bedding material in the trench, and topsoil from unstripped/undisturbed areas would not be used to cover adjacent disturbances. Topsoil would not be handled during excessively wet conditions or at times when the ground or topsoil are frozen.

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. Re-distributed depths of topsoil would vary depending upon available stripping depths.

All disturbed areas would be subject to final grading; however, interim reclamation measures prior to seeding would ensure disturbed areas remain in rough condition to help protect the stability of topsoil after its re-distribution. Also, leaving the graded surface in a roughened condition would improve moisture permeability between the soil/spoil interface and provide micro-sites for seed germination. Compacted soils will be de-compacted using rippers, to a depth of 12 to 18 inches prior to spreading topsoil over the disturbed areas. Sites where this method is not practical (e.g., steep slopes, rocky areas, etc.) would be dozer-tracked perpendicular to the slope or otherwise left with adequate roughness following topsoil placement.

All areas disturbed by construction activities would be reclaimed using native vegetation, or in accordance with applicable land management agency request and/or private landowner specification, insofar as the landowner's requirements are compatible with CEBCS's standards regarding right-of-way restoration and maintenance. If moisture conditions are favorable, permanent seeding will be done in the early fall (September) before the ground freezes. If moisture conditions are not favorable, permanent seeding will be completed in the late fall/early winter when there is no snow cover or frozen soils. If needed, revegetation may occur during the following spring, if needed, depending on weather or construction scheduling.

6.2 Decompaction

Once backfilling has been completed, decompaction will occur. Both top- and subsoils may be decompacted. Soil will be tested at regular intervals in disturbed areas using penetrometers or

other appropriate devices. Similar soil types under similar moisture conditions will be examined in disturbed areas and in undisturbed, off-right-of-way areas, to approximate preconstruction conditions.

Decompaction testing will occur at approximately 0.25-mile intervals on the working side of the right-of-way. Topsoil will be tested for bulk density of 15 percent or greater and will be decompacted with a harrow plow or other deep tillage equipment prior to seeding and mulching, as needed.

In compacted soils, CEBCS will scarify or rip the area to a depth of 6 to 12 inches using a chisel or para-plow, or other similar tillage equipment until the soil density is comparable to areas off the construction right-of-way. If ripped, the ripper shanks will be set apart 12 to 18 inches. Topsoil will be replaced after decompaction is completed. Sandy soils will not be scarified.

If severely compacted agricultural areas are encountered, they will be plowed with a paraplow or other deep tillage implement.

6.3 Seedbed Preparation

In upland soils, CEBCS will disk or harrow the disturbed construction right-of-way approximately 2 to 6 inches deep to roughen the surface to enhance water and root penetration. Drag chains pulled by a tractor or tracked equipment may also be used to rough grade certain portions of the construction work areas.

In areas where access along the right-of-way is required for vehicular travel to hydrostatic test section tie-ins, pipeline drying, or valve sites, the travel lane may not be restored or seeded concurrently with right-of-way restoration. A separate crew will restore the travel lane when contractor access along the right-of-way becomes unnecessary.

If moisture conditions are favorable, permanent seeding will be done in the early fall (September) before the ground freezes. If moisture conditions are not favorable, permanent seeding will be completed in the late fall/early winter when there is no snow cover or frozen soils. If needed, revegetation may occur during the following spring, if needed, depending on weather or construction scheduling.

6.4 Seed Mixes

In cooperation with the USFS, BLM, and private landowners, two seed mixtures have been developed for the project area. On private and state lands crossed by the Project all disturbed areas will receive the seed mix outlined in Table 6.4-1. On federal land crossed by the Project all disturbed areas will receive the seed mix in Table 6.4-2 which was provided by the USFS McKenzie Ranger District and the BLM. All disturbed areas on USFS land would be re-seeded in accordance with the specifications outlined below. The right-of-way would be re-seeded at the end of construction.

In some instances, seed mixtures may need to be modified as a result of limited species availability, poor seed quality, soil type (see Section 6.7 below), or other site differences. These modifications would be made based on site-specific conditions and requirements.

TABLE 6.4-1

Bear Den Project
Approved Seed Mixes for State and Private Land Crossed by the Project

Seed Mix No./Season	Grass Species	Variety	Common Name	Percent of Mix	Actual PLS Mix Lbs/Acre	Broadcast Actual PLS Lbs/Acre
USFS – 1						
Cool Season	Agropyron smithii	Rodan	Western wheatgrass	40	4.00	8.00
	Stipa viridula	Lodorm	Green needlegrass	30	3.00	6.00
Warm Season	Calamovilfa longifolia	Goshen	Prairie sandreed	30	3.00	6.00

TABLE 6.4-2

Bear Den Project
Approved Seed Mixes for State and Private Land Crossed by the Project

Grass Species	Variety	Common Name	Percent of Mix	Actual PLS Mix Lbs/Acre	Drilled Actual PLS Lbs/Acre
Cool Season Grasses					
Elymus canadensis	Mandan	Canada wildrye	15	2.8	2.8
Nassella viridula	Lordorm	Green needlegrass	20	2.4	2.4
Pascopyrum smithii	Rodan	Western wheatgrass	25	4.9	4.9
Warm Season Grasses					
Bouteloua gracilis	Bad River	Blue grama	10	0.3	0.3
Calamovilfa longifolia	Goshen	Prairie sandreed	10	0.8	0.8
Schizachyrium scoparium	Badlands	Little bluestem	10	0.8	0.8
Forbes					
Dalea purpurea	Local	Prairie coneflower	4	0.25	0.25
Helianthus pauciflorus	Bismarck	Stiff sunflower	3	0.7	0.7
Echinacea angustifolia	Bismarck	Purple coneflower	3	0.5	0.5

6.5 Seeding Methods

CEBCS will generally use one of four seeding methods, including seed drill, mechanized broadcast (cyclone) seeder on a tractor, hand cyclone seeder, or hydroseeding.

A seed drill will be used to distribute seed on the right-of-way where slopes and soil conditions allow. Seed shall be planted using a disc drill equipped with depth bands (or a suitable depth regulator to ensure proper depth of planting) and packer wheels. Seed shall be drilled between one quarter inch (1/4") and one half (1/2") inch deep. Care will be taken to ensure light seed (e.g., winter fat) is evenly applied with heavier seed.

A hand-operated or mechanically powered cyclone seeder will be used when a seed drill is not suitable. The seeding rate will be doubled where a broadcast seeder is used. This method distributes the seeds on the surface and the seeds are subsequently covered by use of a cultipacker, rake, or dragging a chain behind the seeding equipment. Hand-operated cyclone seeders will be used on slopes too steep for equipment to be operated safely. If rock is not present in these areas, hand dragging or raking will be used to incorporate the seed.

Hydroseeding and hydromulching are not expected to be used except in areas where conventional seeding and mulching techniques cannot be applied (i.e., slopes exceeding 25 percent), or when requested by the landowner. The seeding rate during hydroseeding will be broadcast application rate (i.e., twice the drilled rate).

General seeding of disturbed areas will occur in accordance with written recommendations for preparation, rates, methods, and dates obtained from land management agencies, the local soil conservation authority, or as requested by the landowner. CEBCS will only purchase seed which has been tested for viability to ensure that desired seed viability exceeds 95 percent. All seed shall be State of North Dakota Certified or Registered seed (or certified/registered by the state of origin); certification tags shall be made available to the authorized officer for inspection before seed is planted.

Seeding will typically occur within 6 days following restoration. In some areas seeding may be delayed by weather. In these instances, seeding will occur in the following spring. If seeding cannot be done within the recommended seeding dates, the appropriate interim erosion control measures discussed in section 3.5 will be installed and seeding of permanent vegetation will be performed at the beginning of the next season. In no case will seeding be delayed beyond the next available seeding season.

6.6 Mulch Crimping and Punching

CEBCS will mulch disturbed areas designated by the authorized officer. All disturbed areas with less than 40 percent slope shall be mulched as directed in 1, 2, or 3 below. All disturbed areas with slopes greater than 40 percent shall be mulched as directed in 4 below.

1. Straw used for mulching shall be from wheat, oats, barley, or other approved grain crops and free from noxious weeds or other objectionable material as determined by the authorized officer. Stem length of straw used for mulch shall average 10" (ten inches) or longer. Straw mulch shall be suitable for distribution with mulch blower equipment, and shall be anchored utilizing an acceptable mulch crimper. Straw mulch shall be applied at a rate of 1.5 tons (3000 lbs.) per acre.

2. Hay utilized for mulching shall be grass, free from noxious weeds or other objectionable material as determined by the authorized officer. Stem length of grass hay used for mulch shall average 10" (ten inches) or longer. Grass hay shall be suitable for distribution with mulch blower equipment, and shall be anchored utilizing an acceptable mulch crimper. Grass hay mulch shall be applied at a rate of 1.5 tons (3000 lbs.) per acre.

3. Wood cellulose fiber shall be natural or cooked wood cellulose fiber, shall disperse readily in water, and shall be nontoxic. The homogeneous slurry or mixture shall be capable of application with power spray equipment. A colored

dye that is non-injurious to plant growth may be used when specified. Wood cellulose fiber shall be packaged in new, labeled containers. Rocky areas not conducive to straw or grass hay crimping will be mulched with wood cellulose fiber. Wood cellulose fiber mulch shall be applied at a rate of 1 ton (2000 pounds) per acre.

Organic erosion control mats shall be constructed of organic materials (aspen, straw, or similar), bound with a biodegradable mesh or netting, and shall be stapled to the soil as specified by the manufacturer.

6.7 Soil Mitigation

To promote the optimum regrowth potential for areas with soils that are difficult to stabilize and reclaim, CEBCS has conducted a detailed analysis of soils along the pipelines' route that assessed areas which contain shallow soils, droughty soils, highly erodible soils, and those with a high potential for flooding. Slope, geomorphologic features, and vegetative cover were also factored into the analysis. The results of the analysis combined all factors to develop recommendations for site-specific mitigation and seed mixes which are best suited to these areas. The resulting mitigation will produce a stable right-of-way and maximize regrowth potential for the reclaimed areas. Many of these soil characteristics overlap one another. CEBCS' EIs will be responsible for assessing areas where the following mitigation measures would be utilized and determining the specific measures for each area that will be applied.

6.7.1 Shallow Soils

On steep slopes, shallow soils are extremely erosive. Rooting depth is limited and the soils have limited water storage capacity. These areas include shallow, shallow rock, bedrock, and bedrock outcrop areas. At the discretion of the EI, CEBCS may reduce the amount of soil that is removed and stored as topsoil in these areas. Rock mulch will be applied over shallow areas to stabilize topsoil, reduce erosion potential, and blend the areas with the surrounding landscape. The use of rock mulch also reduces evaporation from the soil surface, improving soil moisture retention and facilitating revegetation. CEBCS will attempt to blend rock mulch into the adjacent landscape during restoration.

6.7.2 Droughty Soils

Droughty soils occur as a result of soil texture, landscape position, aspect, and slope. There are several areas along the pipelines' route which contain these soils. They typically occur in south and west aspects, sandy flat areas, and steep slope areas with limited water holding capacity where run off is a problem. These areas include sandy, droughty, elevated terrace, steep slope, or coarse alluvium, fragmental, or coarse-textured areas. These areas will be reseeded with seed mixes which contain plant species that are best suited for extended drought conditions. The initial seeding and/or planting will avoid shrub species that can compete with herbaceous species.

Several water conservation practices have been developed to assist with the revegetation of droughty soils in arid locations, including, contour scarification and furrowing, terracing, pocking, and ripping. Water conservation measures will be applied to revegetate droughty areas as indicated by site-specific conditions and as recommended by the EI.

6.7.3 Flood-Prone Soils

These areas include waterbody "low bottoms" and unstable areas that are prone to flooding. CEBCS will pay particular attention to decompaction activities in these areas. Special attention will be paid to those areas that are well vegetated or in active hay or crop production. Decompaction and rough grading prior to seeding will increase the potential for water absorption during precipitation or run off events as these areas can also be coarse-textured and subject to drought. Temporary and permanent slope breaker placement (sections 3.5.1 and 3.13.2, respectively) may also be modified at the discretion of the EI to prevent water ponding or to dissipate water velocity during run off periods.

6.7.4 Highly Erodible Soils

Highly erodible soils are typically found in association with steep slopes and are often dictated by substrate. Erosion and deposition are issues that affect the potential for successful revegetation. Where native rock has been excavated, it may be spread as mulch over these areas. If straw mulch is applied, a crimping device may be utilized, as indicated in section 6.3. In areas with slopes in excess of 40 percent, CEBCS may utilize geotech fabrics or anionic polyacrylamide (PAM) erosion control, as necessary, to stabilize these soils during reclamation.

Mulching (weed free straw) will be used to stabilize soils susceptible to wind and water erosion and is accompanied by revegetation seeding with suitable species. Additionally, CEBCS may utilize straw wattles which will be placed on contours to reduce runoff velocity and resulting erosion.

6.8 Weed Control

Weed control practices would be implemented to limit the growth and spread of weeds and to ensure that revegetation is successful with the proposed seed mixtures in accordance with CEBCS's project-specific Weed Management Plan (Appendix K of the POD). The goals of that plan are to implement preventative measures to eliminate the spread of weeds during construction of the pipeline and to implement prescribed treatments to eliminate, to the maximum extent possible, the invasion of weeds from surrounding lands. Monitoring during the construction and operational phases will help ensure that these goals are achieved.

6.9 Cleanup

Following completion of reclamation, all trash, debris, and other solid wastes would be removed from the right-of-way, temporary use areas, and auxiliary facilities. All waste material would be properly disposed of in the appropriate manner in existing authorized sanitary landfills. No solid waste would be buried along the right-of-way. After final cleanup, the area would be inspected by the Environmental Inspector, landowner, and/or Authorized Officer to verify that pre-construction commitments for the right-of-way and ancillary facilities are satisfied.

6.10 Post-Construction Reclamation Monitoring

To assess the effectiveness of the reclamation treatments and to evaluate the condition of right-of-way, CEBCS will implement a monitoring program consisting of field inspections and vegetative analysis. A report of the condition of the right-of-way and the status of sensitive resources affected during construction will be submitted to the BLM. The monitoring program will also identify remedial measures that will be considered by CEBCS to mitigate environmental degradation if the initial treatments were not effective in achieving the objectives of the

reclamation program. The intent of reclamation is to restore the project area to a beneficial pre-existing land use, prevent undue or unnecessary degradation of the environment, and reclaim disturbed areas such that these areas are visually and functionally compatible with the surrounding topography. The following sections outline the sequential steps for reclaiming project-related disturbances.

6.11 Reclamation Monitoring Criteria

On federal lands, vegetation monitoring will occur on an annual basis for the first five years or until revegetation is successful. Successful reclamation performance will be based on revegetation success, the absence of noxious weeds, stability of the construction right-of-way, waterbody bed and bank stability, and visual aesthetics. CEBCS will consider long-term revegetation to be successful if approximately 70 percent of the background cover is reestablished in disturbed areas. In addition, vegetative monitoring will determine if, or to what extent, noxious weeds have become established in the project areas. Monitoring may continue after the five-year period in areas where revegetation, weed, and stability problems continue. Specific reclamation success criteria will be established in coordination with the BLM, USFS, and other applicable land management agencies.

6.12 Monitoring Techniques and Procedures

To evaluate the success of revegetation, CEBCS will use a quantitative rapid diversity assessment. This is an effective and efficient technique to monitor the composition of vegetative cover and diversity over time and between sampling plots. The technique is useful to measure the response of vegetation to disturbance.

In association with a vegetative monitoring program, CEBCS will assess the success of reclamation efforts to stabilize soil and waterbodies.

6.12.1 Vegetation Monitoring

CEBCS will monitor quadrats (*i.e.,* rectangular analytical plots identified in the field and retrievable by GIS equipment) located in the right-of-way, and control quadrats located outside the right-of-way. Monitoring will occur in July during the first five years following reclamation. Plant diversity, frequency, and percent cover data will be collected. Data obtained from the reclaimed right-of-way will be compared to vegetative data obtained from the undisturbed, naturally occurring vegetative populations adjacent to the right-of-way. Variation between plots will provide a quantitative indication of the relative success of reclamation.

In areas where plantings/transplanting occurred, reclamation success will be based on survivorship and vigor of the transplants.

6.12.2 Erosion and Runoff Control

Biweekly ground and aerial inspections of the route by CEBCS Pipeline Operations and Maintenance (O&M) personnel should detect areas of erosion (*i.e*., formation of gullies, deposition of sediment) and uncontrolled runoff (*i.e.,* berm washouts) before significant impacts occur. In addition to O&M reconnaissance, reclamation specialists will conduct annual inspections during July of first five years following reclamation to assess the condition of the right-of-way and the effectiveness erosion control measures. This ground inspection will

concentrate on steep slopes, erodible soils, and sensitive areas identified during construction by the EIs.

6.12.3 Waterbody Stabilization

In association with erosion control and runoff inspections, CEBCS representatives will visually assess the condition of bed and bank stabilization measures installed during restoration at waterbodies that were constructed using site-specific crossing plans. This assessment will occur with the same frequency of the erosion and runoff control inspections.

6.13 Remedial Action

CEBCS will consult with the Authorized Officer or appropriate agency personnel prior to initiating remedial actions. This consultation will establish a work schedule, prioritize the list of actions to be taken, identify the equipment required, and describe mitigative measures that will be implemented.

7.0 OPERATION AND MAINTENANCE OF THE FACILITIES

CEBCS will operate and maintain the pipelines in accordance with federal and state regulations. The pipeline system will be monitored and controlled 24 hours a day by a remote dispatch center.

Aboveground facilities will be inspected annually to satisfy DOT requirements. Pipeline inspections will encompass testing equipment, recalibration, and repair, replacement, and reporting, as necessary.

The pipeline system will be inspected on average once every two weeks on the ground or in the air to detect and identify indications of leaks, evidence of pipeline damage, or environmental concerns (*e.g.*, erosion hazards, gullies, sedimentation of waterbodies, all-terrain vehicle rutting, etc.). Inspections will be conducted in accordance with minimum federal safety standards, Transportation of Hazardous Liquids by Pipeline, Title 49 CFR Part 195. Environmental concerns will be addressed as necessary to comply with conditions in this plan.

The pipelines will be protected from external corrosion (pitting) by the protective coating applied to the pipe and by installation of a cathodic protection system. The external pipe coating is the primary corrosion protection method. Cathodic protection applies an electrical current to the pipelines from an external direct current power source (rectifier) to prevent corrosion where the coating is not 100 percent effective. Rectifiers will be located near existing power distribution lines and mounted on poles in or adjacent to the right-of-way and connected to carbon anode ground bed within the permanent pipeline right-of-way. The condition of the pipe coating and effectiveness of the cathodic protection system will be monitored in accordance with federal standards and regulations. Repairs to the pipe, pipe coating, or the cathodic protection system will be made as appropriate.

Locations of the cathodic protection rectifiers and ground beds associated with the pipelines cannot be identified until the pipelines are installed and tests are conducted. Test leads will be attached to the line at roads, pipeline crossings, and highways to monitor the cathodic protection system. Each set of test leads will be connected in a junction box installed on the ground surface along the right-of-way. The junction boxes will not interfere with existing land uses.

Pipeline markers will be installed to mark the underground location of the pipelines and to identify the owner of the system and to display telephone numbers for emergencies or other inquiries. The pipeline markers will be located where the pipelines cross fence lines, roadways, waterbodies, and other public access locations.

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, state, 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.

8.0 ABANDONMENT

CEBCS has no plan to abandon the pipeline facilities. If and when CEBCS chooses to abandon part or all of the proposed facilities, CEBCS will develop an abandonment plan. An Abandonment Plan would be submitted to the Authorized Officer for approval at least 60 days prior to abandonment of facilities on federal land and a pre-abandonment conference scheduled.

If abandonment were to occur, the pipelines would be purged of liquid residues, cleaned, isolated from interconnections with other pipelines, and sealed without removing the pipe from the ground. With regular maintenance during operation, the operational life of pipelines typically exceeds 50 years. Therefore, CEBCS does not anticipate long-term soil subsidence due to a lack of pipe integrity or excessive corrosion.

Abandonment in place minimizes surface disturbance and other potential environmental effects from pipe removal. Aboveground pipeline facilities, including equipment and foundations, at pump and meter stations would be removed, and the station properties reclaimed to maintain consistency with federal land use plans.

Upon abandonment of the pipelines in part or in whole, the easement associated with the abandoned facilities will typically be returned to the landowners or land managing agencies according to the easement agreements.

BEAR DEN PROJECT

ATTACHMENT 2
Weed Management Plan

BEAR DEN PROJECT

Plan of Development

Weed Management Plan

Prepared for:

BUREAU OF LAND MANAGEMENT

June 2013

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1.0 INTRODUCTION

This plan was developed to identify noxious weed and invasive species control practices that will be implemented for the CenterPoint Energy Bakken Crude Services, LLC (CEBCS) Bear Den Project (Project). Pursuant to North Dakota Century Code § 4.1-47, North Dakota Law requires that measures be taken to control the spread of noxious weeds. Noxious weeds have the potential to invade areas disturbed by construction and may spread along the cleared areas of the pipeline right-of-way. Soil disturbance may also allow weed seed already present to germinate and grow.

Several laws, regulations, and policies govern the management of noxious weeds on public and private lands. Under the Noxious Weed Act, county, state, and federal agencies are charged with the responsibility to identify and control invasive plant species that are harmful to public health, crops, livestock, land, or other property. Weed boards may issue individual notices requiring control of noxious weeds on a particular property, and can cause weeds to be controlled with all expenses to be paid by the person in possession of the property. This plan is consistant with the Land and Resource Management Plan for the Dakota Prairie Grasslands Northern Region, the North Dakota Weed Control Guide, the North Dakota Prairie Grasslands Noxious Weed Management Project, and US Forest Service stipulations regarding herbicide use. The North Dakota Department of Agrigulture's Noxious Weed Team controls noxious weeds by organizing the efforts of the county and city level Noxious Weed Boards.

1.1 Plan Purpose

The purpose of this plan is to prescribe methods to prevent and control the spread of noxious weeds and invasive species (hereinafter referred to as weeds) during and following construction of the Bear Den Project. CEBCS and its contractors will be responsible for carrying out the methods described in this plan.

This plan is applicable to the installation of the pipeline and ancillary facilities within the temporary construction right-of-way, permanent operational right-of-way, staging areas, access roads, and any other disturbed areas associated with the Bear Den Project.

1.2 Goals and Objectives

The goals of weed control are to implement preventative measures to eliminate the spread of weeds during construction of the pipeline and to implement prescribed treatments to eliminate, to the maximum extent possible, the invasion of weeds from surrounding lands. Monitoring during the construction and operational phases will ensure that these goals are achieved.

2.0 WEED INVENTORY

CEBCS has conducted field studies, file searches, and weed consultations to identify existing weed infestations along the pipeline right-of-way and adjacent extra workspaces, along new or improved access roads, and within ancillary facility locations where clearing will be required. To identify weeds that potentially occur within the proposed project area and known locations of weed infestations crossed by the proposed project, CEBCS consulted with the Bureau of Land Management (BLM), U.S. Forest Service (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, will be coordinated with the BLM.

Table 2-1 lists the weeds that are known to occur or have the potential to occur along the proposed pipeline route as identified through agency consultations.

TABLE 2-1

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

Common Name	Scientific Name	USFS Designated Species	North Dakota Designated Species	Species Identified During Noxious Weed Surveys [a]
Russian knapweed	*Acroptilon repens*	X	X	
Creasted 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 Attachment 1

3.0 WEED MANAGEMENT

Weeds are spread by a variety of means including pedestrian vectors (e.g., hiking, recreation, etc.), construction equipment, construction and reclamation materials, livestock, and wildlife. Implementation of preventative measures to control the spread of weeds is the most cost effective management approach. The Bear Den Project will implement weed control management measures that are consistant with the standards and guidelines included in the

Land and Resource Management Plan for the Dakota Priarie Grasslands regarding noxious weeds and invasive species.

3.1 Preventative Measures

The following preventative measures will be used to prevent the spread of weeds along the Bear Den Project right-of-way and within ancillary facilities:

- All Contractor equipment will arrive at the work site clean and weed-free. Prior to being allowed access to the right-of-way or ancillary facilities, all equipment will be power or high-pressure air washed. In addition, all equipment leaving an area infested with noxious weeds will first be cleaned with an air compressor to limit the spread of noxious weed seeds and propagules.

- An inspector will ensure that equipment is free of soil and debris capable of transporting weed seeds, roots, or rhizomes. An inspector will place a sticker on equipment determined to be free of weeds.

- The pipeline right-of-way and ancillary facility sites were inspected for weeds prior to the clearing of vegetation on the right-of-way and ancillary facilities. Infestations were recorded for reference in clearing the right-of-way and ancillary facilities for construction and for post-construction monitoring.

- 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. Final revegetation would occur within the approved seeding window.

- The contractor will implement reclamation of disturbed lands following construction as outlined in CEBCS's project-specific *Construction, Reclamation, and Monitoring Plan* (Appendix E of the Plan of Development). Continuing revegetation efforts will ensure adequate vegetative cover to prevent the invasion of weeds.

- The contractor will ensure that straw bales, used on the project for sediment barrier installations, or mulch are certified weed-free.

- Equipment will not be sprayed with pre-emergent chemicals as a preventative measure as these chemicals target a wide range of vegetation. As a result, the use of such chemicals could affect the success of revegetation efforts.

Field wash stations with water are not proposed as a preventative measure as they have not proven to be an effective means of weed control. In order for a wash station to be effective, high-pressure steam cleaners and controlled drainage are essential. These criteria cannot be met in the field. As a result, field wash stations run the risk of creating conditions favorable to seed germination (e.g., presence of seeds or rhizomes, presence of disturbed soils, water from uncontrolled drainage).

3.2 Treatment Methods

Weed controls will 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 right-of-way 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 right-of-way locations, appropriate control measures will be implemented in an attempt to eradicate the identified weed infestations along the right-of-way and to reduce the spread or proliferation of weeds. Post-construction control measures may include one or more of the following methods:

- Mechanical methods reliant on the use of equipment to disk or excavate weed populations. If this method is used, subsequent seeding will be conducted to re-establish a desirable vegetative cover, which will stabilize the soils and slow the potential re-invasion of weeds. Seed selection will be based on site-specific conditions, and the appropriate seed mix identified for those conditions, as presented in the *Construction, Reclamation, and Monitoring Plan*.

- Herbicide application is an effective means of reducing the size of weed populations. Herbicide application and handling methods are described in section 5.0 below.

3.3 Education

CEBCS and the contractor will provide information regarding weed identification, management, and impacts on agriculture, livestock, and wildlife to their appropriate employees. The critical importance of preventing the spread of weeds in areas not infested and controlling the proliferation of weeds already present will be explained. The importance of adhering to measures to prevent the spread of weeds (e.g., not driving off the cleared right-of-way, cleaning equipment that collect soil and plant seeds, and quickly identifying new infestations of weeds) will be stressed.

4.0 MONITORING

CEBCS will annually monitor the right-of-way and ancillary facilities for weeds following construction and reclamation of the project for a period of five years. Locations of infestations, and extent of infestations, will be submitted to the BLM, USFS, or the local weed district, depending on the location of the infestation. If species or colonies of species are found in numbers which are significantly different from existing nearby off right-of-way locations, CEBCS will conduct spot eradication of those species.

5.0 HERBICIDE APPLICATION, HANDLING, SPILLS, AND CLEANUP

Herbicide selection (if required) would be based on information gathered from local county weed control districts and the BLM, and would be consistant with the USFS' stipulations for herbicide use as found in the Dakota Prairie Grasslands Noxious Weed Management Project, if located on Forest Service land.

5.1 Herbicide Application and Handling

Prior to herbicide application, CEBCS' contractor will obtain any required permits from the local authorities (BLM or weed district). CEBCS or the contractor would submit a Pesticide Use Proposal to document their use of herbicide on federally administered lands, as well as a pesticide application report within 24 hours following application. The chemical application will be done by a licensed contractor in accordance with all applicable laws and regulations.

Herbicide label instructions and manufacture guidelines will be strictly adhered to. For example, manufacturer's guidelines recommend that herbicides only be applied under appropriate weather conditions (i.e., periods of low wind speeds, when precipitation is not imminent, etc.), that application sprayers be mounted low to the ground, and that sprayer booms incorporate specialized nozzles designed to produce large droplet sizes with limited drift potential. Adherence to these specifications and manufacturer label directions would minimize the potential for drift or transport of herbicides to off right-of-way areas.

Vehicle-mounted sprayers (e.g., handgun, boom, and injector) will be used primarily in open areas that are readily accessible by vehicle. Hand application methods (e.g., backpack spraying) that target individual plants will be used to treat small scattered weed populations in rough terrain. Calibration checks of equipment will be conducted at the beginning of spraying and periodically thereafter to ensure proper application rates are being achieved.

Herbicides will be transported daily to the project site with the following provisions:

- Herbicides will be premixed and delivered in returnable/refillable containers and transferred by closed system to application tanks to limit worker and environmental exposure and eliminate the need for disposal of herbicide containers in area landfills.

- Herbicides will be transported in a manner that will prevent tipping or spilling;

- Mixing of surfactants or other additives with water or other carriers and refilling of containers will typically be conducted at road crossings, and no mixing or filling will occur within 200 feet of open or flowing water, wetlands, or other sensitive resources; and

- Mixing and application procedures will be supervised by a licensed commercial applicator, and monitoring will be conducted to ensure that proper mixing, application, cleanup, personal protection and safety procedures are followed;

- All herbicide equipment and containers will be inspected daily for leaks.

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BEAR DEN PROJECT

ATTACHMENT 1
Weed Technical Memo

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NATURAL RESOURCES ◆ SCIENTIFIC SOLUTIONS

Western **E**co**S**ystems **T**echnology, Inc. ◆ 415 W. 17th St., Suite 200 ◆ Cheyenne, WY 82001
Phone: 307.634.1756 ◆ Fax: 307.637.6981 ◆ Website: www.west-inc.com

TECHNICAL MEMORANDUM

DATE: December 13, 2012

TO: Cameron Young, NRG

FROM: Elizabeth Lack, Ann Dahl, & Clayton Derby, WEST, Inc.

RE: Weed Survey Results, Bear Den Project, McKenzie and Dunn Counties, ND

Western EcoSystems Technology, Inc. (WEST) was contracted by NRG to document the occurrence of weeds within the Bear Den project area in McKenzie and Dunn Counties, North Dakota (Figure 1). The project area includes the pipeline survey corridor (width is 200 feet, 100 feet either side of the centerline), access road survey corridor (width is 50 feet, 25 feet either side of centerline), five well pads (600 foot radius around the well), and two staging area. Portions of the project area cross federal lands, including both U.S. Forest Service (USFS) Little Missouri National Grasslands (LMNG) and Bureau of Land Management (BLM) lands (Figure 1). The federal lands occur as non-contiguous parcels and many of the project crossings occur on corners or along edges of a parcel, particularly on the BLM lands, whereas others are several miles in length on the larger USFS parcels (Figure 1).

The weed survey included documentation of plant species in the project area that are on the North Dakota noxious weed list (Table 1), available from the North Dakota Department of Agriculture website (http://www.nd.gov/ndda/program/noxious-weeds). In addition, on federal lands, plant species on the invasive/noxious plant species list provided by the USFS in their May 3, 2012 guidance letter were documented (Table 2). The BLM did not provide a list of invasive or noxious weed species, but USFS invasive/noxious plant species were also documented on BLM lands.

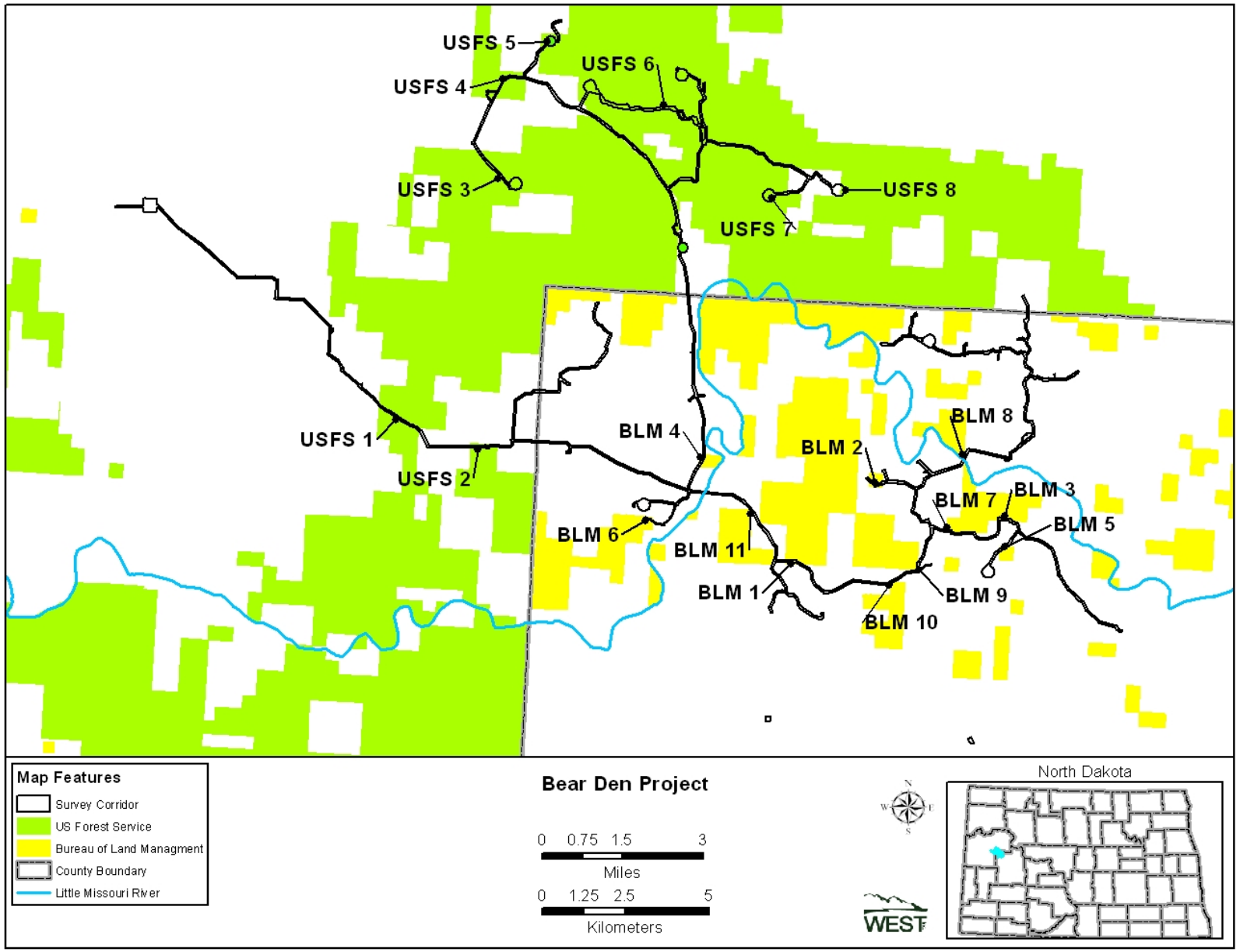

Figure 1. Location of Federal Lands – Bear Den Project

Table 1. North Dakota Noxious Weeds

Scientific Name	Common Name
Acroptilon repens	Russian Knapweed
Artemisia absinthium	Absinth Wormwood
Carduus nutans	Musk Thistle
Centaurea diffusa	Diffuse Knapweed
Centaurea maculosa	Spotted Knapweed
Cirsium arvense	Canada Thistle
Euphorbia esula	Leafy Spurge
Linaria genistifolia	Dalmatian Toadflax
Linaria vulgaris	Yellow Toadflax
Lythrum salicaria	Purple Loosestrife
Tamarix chinensis, T. parviflora, T. ramosissima	Saltcedar

Table 2. Little Missouri National Grasslands Invasive/Noxious Plant Species

Scientific Name	Common Name
Forbs	
Artemisia absinthium	Absinth Wormwood
Cardaria draba	Hoary Cress
Carduus acanthoides	Musk Thistle
Carduus nutans	Plumeless Thistle
Centaurea diffusa	Diffuse Knapweed
Centaurea maculosa	Spotted Knapweed
Centaurea repens	Russian Knapweed
Centaurea solstitalis	Yellow Starthistle
Cirsium arvense	Canada Thistle
Convolvulus arvensis	Field Bindweed
Euphorbia esula	Leafy Spurge
Cynoglossum officinale	Houndstongue
Hyoscyamus niger	Henbane
Lythrum salicaria	Purple Loosestrife
Melilotus spp.	Yellow or White Sweetclover
Sonchus spp.	Sowthistle
Tamarix spp.	Saltcedar
Grasses	
Agropyron cristatum	Crested Wheatgrass
Agropyron elongatum	Tall Wheatgrass
Agropyron intermedium	Intermediate Wheatgrass
Agropyron repens	Quackgrass
Bromus inermis	Smooth Brome
Bromus japonicas	Japanese Brome
Bromus tectorum	Downy Brome/Cheatgrass
Poa pratensis	Kentucky Bluegrass
Poa compressa	Canada Bluegrass

Methods

Documentation of weeds species in the Bear Den project area was conducted in conjunction with rare plant surveys, conducted between August 25 and September 15, 2012, and wetland and waterbody surveys conducted from late August to early October 2012. When a plant species was encountered that was on the North Dakota noxious weed list, or the USFS invasive/noxious list when on federal lands, the location was recorded on a GPS, along with information on percent cover class (0 to 10%, 10 to 25%, 25 to 50%, 50 to 75%, and 75 to 100%), estimated number of plants (10 or less, 11 to 50, 51 to 100, 101 to 200, 201 to 500, and greater than 500), and phenology (vegetative, flower, or seed). Both GPS points and polygons were recorded. Points were recorded for one plant, or more than one plant when located in close proximity to each other. A radius around each recorded point was noted within which the species occurred. Polygons were recorded when the weed species was found throughout the width of the survey corridor and the length of the polygon was recorded. More than one weed species could occur in a polygon or point radius.

Results

Three species on the North Dakota noxious weed list were documented within the Bear Den project area: *Cirsium arvense, Euphorbia esula,* and *Artemisia absinthium*. In addition, several USFS invasive/noxious species were documented on federal lands, including *Bromus inermis, Bromus japonicas, Poa pratensis, Agropyron cristatum,* and *Convolvulus arvensis*. The following table lists each weed occurrence found in the Bear Den project area, and the attached maps show the location of each occurrence.

Table 3. Weed Occurrences – Bear Den Project Area

Unique ID	Species	Data Type	Population Radius (ft)	Acreage	Percent Cover	Estimated Number	Phenology	Federal Land?
x-du-b-001	*Bromus inermis*	Polygon		5.27	0-10%	500+	Seed	BLM
x-du-b-002	*Cirsium arvense*	Point	150	1.27	10-25%	500+	Seed	BLM
x-du-b-011	*Cirsium arvense*	Point	30	0.06	25-50%	500+	Seed	
x-du-b-012	*Cirsium arvense*	Point	20	0.03	50-75%	500+	Seed	
x-du-b-013	*Cirsium arvense*	Point	100	0.69	25-50%	500+	Seed	
x-du-b-014	*Cirsium arvense*	Point	25	0.04	10-25%	201 - 500	Seed	
x-du-b-016	*Tamarisk*	Point	10	0.01	0-10%	11 - 50	Flower	
x-du-c-001	*Poa pratensis*	Polygon		6.04	0-10%	500+	Seed	BLM
x-du-c-002	*Cirsium arvense*	Point	50	0.16	10-25%	500+	Seed	BLM
x-du-c-005	*Artemisia absinthium*	Point	100	0.64	0-10%	51 - 100	Flower	
x-du-c-006	*Euphorbia esula*	Point	75	0.40	0-10%	51 - 100	Vegetative	
x-du-c-007	*Euphorbia esula*	Point	50	0.18	0-10%	51 - 100	Flower	
x-du-c-008	*Cirsium arvense*	Polygon		13.79	0-10%	500+	Seed	
x-du-c-009	*Euphorbia esula*	Point	50	0.18	0-10%	51 - 100	Vegetative	
x-du-c-011	*Poa pratensis*	Polygon		0.21	0-10%	500+	Seed	BLM
x-du-c-012	*Cirsium arvense*	Point	50	0.18	0-10%	51 - 100	Vegetative	
x-mc-b-001	*Agropyron cristatum*	Polygon		2.83	0-10%	500+	Vegetative	USFS
	Poa pratensis	Polygon		2.83	0-10%	500+	Vegetative	USFS
	Bromus inermis	Polygon		2.83	0-10%	500+	Vegetative	USFS
x-mc-b-002	*Poa pratensis*	Point	600	25.31	0-10%	500+	Vegetative	USFS
x-mc-b-003	*Poa pratensis*	Polygon		4.61	0-10%	500+	Vegetative	USFS
x-mc-b-004	*Agropyron cristatum*	Point	600	25.34	50-75%	500+	Seed	USFS
x-mc-b-005	*Poa pratensis*	Polygon		1.50	25-50%	500+	Seed	USFS
x-mc-b-006	*Poa pratensis*	Polygon		9.25	25-50%	500+	Seed	USFS
x-mc-b-007	*Poa pratensis*	Polygon		4.24	50-75%	500+	Seed	USFS
x-mc-b-008	*Agropyron cristatum*	Polygon		12.70	75-100%	500+	Seed	USFS
x-mc-b-009	*Cirsium arvense*	Polygon		2.01	25-50%	500+	Vegetative	
x-mc-b-010	*Cirsium arvense*	Point	30	0.06	50-75%	500+	Seed	
x-mc-c-001	*Cirsium arvense*	Point	5	0.01	50-75%	100	Seed	USFS
x-mc-c-002	*Agropyron cristatum*	Polygon		21.52	10-25%	500+	Seed	USFS

Unique ID	Species	Data Type	Population Radius (ft)	Acreage	Percent Cover	Estimated Number	Phenology	Federal Land?
	Poa pratensis	Polygon		21.52	0-10%	500+	Seed	USFS
	Bromus inermis	Polygon		21.52	1-10%	500+	Seed	USFS
x-mc-c-003	*Bromus inermis*	Polygon		17.77	10-25%	500+	Seed	USFS
	Agropyron cristatum	Polygon		17.77	10-25%	500+	Seed	USFS
	Poa pratensis	Polygon		17.77	10-25%	500+	Seed	USFS
x-mc-c-004	*Cirsium arvense*	Point	20	0.02	0-10%	11 - 50	Vegetative	USFS
x-mc-c-005	*Cirsium arvense*	Point	50	0.12	25-50%	201 - 500	Seed	USFS
x-mc-c-006	*Bromus inermis*	Point	200	1.61	0-10%	201 - 500	Seed	USFS
x-mc-c-007	*Bromus inermis*	Point	50	0.18	10-25%	51 - 100	Seed	USFS
x-mc-c-008	*Bromus inermis*	Point	20	0.03	10-25%	11 - 50	Seed	USFS
x-mc-c-009	*Cirsium arvense*	Point	200	1.67	25-50%	101 - 200	Seed	USFS
x-mc-c-010	*Bromus inermis*	Point	50	0.12	50-75%	201 - 500	Seed	USFS
x-mc-c-011	*Bromus inermis*	Point	20	0.03	25-50%	51 - 100	Seed	USFS
x-mc-c-012	*Bromus inermis*	Point	20	0.03	10-25%	51 - 100	Seed	USFS
x-mc-c-013	*Bromus inermis*	Point	200	1.77	10-25%	201 - 500	Seed	USFS
x-mc-c-014	*Cirsium arvense*	Point	50	0.18	0-10%	11 - 50	Flower	USFS
x-mc-c-015a-c	*Agropyron cristatum*	Polygon		80.65	0-10%	500+	Seed	USFS
	Poa pratensis	Polygon		80.65	0-10%	500+	Seed	USFS
x-mc-c-018	*Bromus inermis*	Point	30	0.06	10-25%	51 - 100	Seed	USFS
x-mc-c-019	*Bromus inermis*	Point	20	0.03	0-10%	51 - 100	Seed	USFS
x-mc-c-020	*Cirsium arvense*	Polygon		17.27	0-10%	500+	Seed	USFS
	Poa pratensis	Polygon		17.27	0-10%	500+	Seed	USFS
x-mc-c-021	*Poa pratensis*	Polygon		23.03	0-10%	500+	Seed	USFS
x-mc-c-023	*Agropyron cristatum*	Point	200	2.37	10-25%	500+	Seed	USFS
x-mc-c-024	*Agropyron cristatum*	Point	200	2.88	10-25%	500+	Seed	USFS
x-mc-c-025	*Bromus japonicus*	Point	50	0.18	10-25%	201 - 500	Seed	USFS
x-mc-c-026	*Agropyron cristatum*	Polygon		54.22	0-10%	500+	Seed	USFS
	Bromus inermis	Polygon		54.22	0-10%	500+	Seed	USFS
x-mc-c-027	*Cirsium arvense*	Point	50	0.18	0-10%	201 - 500	Vegetative	USFS
x-mc-c-030	*Cirsium arvense*	Point	50	0.18	0-10%	201 - 500	Vegetative	USFS
x-mc-c-032	*Poa pratensis*	Polygon		31.69	0-10%	500+	Seed	USFS

Unique ID	Species	Data Type	Population Radius (ft)	Acreage	Percent Cover	Estimated Number	Phenology	Federal Land?
	Bromus inermis			31.69	0-10%	500+	Seed	USFS
x-mc-c-033	*Cirsium arvense*	Point	100	0.52	10-25%	201 - 500	Vegetative	USFS
x-mc-c-034	*Cirsium arvense*	Point	100	0.72	0-10%	500+	Seed	USFS
x-mc-c-035	*Convolvulus arvensis*	Point	50	0.14	0-10%	101 - 200	Vegetative	USFS
x-mc-c-036	*Agropyron cristatum*	Point	50	0.18	0-10%	51 - 100	Seed	USFS
x-mc-c-039	*Convolvulus arvensis*	Point	75	0.40	0-10%	51 - 100	Vegetative	USFS
x-mc-c-040	*Poa pratensis*	Polygon		19.64	0-10%	500+	Seed	USFS
x-mc-c-042	*Poa pratensis*	Polygon		3.60	0-10%	500+	Seed	USFS
	Bromus japonicus	Polygon		3.60	0-10%	500+	Seed	USFS
x-mc-c-048	*Poa pratensis*	Polygon		17.22	0-10%	500+	Seed	USFS
x-mc-c-050	*Bromus inermis*	Point	30	0.06	0-10%	51 - 100	Seed	USFS
x-mc-c-051	*Agropyron cristatum*	Polygon		20.18	25-50%	500+	Seed	USFS
	Poa pratensis	Polygon		20.18	0-10%	500+	Seed	USFS

BEAR DEN PROJECT

ATTACHMENT 3
Draft Bear Den Construction Schedule

Attachment 3

Bear Den Project

Anticipated Construction Segments and Schedule

Project Section	Pipeline Segments	Anticipated Construction Start Date	Anticipated Construction Completion Date
A	AR, AR-4, AR-9, AR-12, AR-16, AR-17, AR-23, AR-26, AR-28, AR-30 ARW, ARW-4, ARW-9, ARW-12, ARW-17, ARW-23, ARW-26, ARW-28, ARW-30	15-Jul-13	15-Sep-13
B	AR-6, AR-8, AR-10, AR-13, AR-14, AR-15, AR-19, AR-20, AR-21, AR-22, AR-29, AR-30, AR-32, AR-34 ARW-6, ARW-8, ARW-10, ARW-13, ARW-14, ARW-15, ARW-19, ARW-20, ARW-21, ARW-22, ARW-29, ARW-32, ARW-34, ARW-36, ARW-39	01-Sep-13	01-Nov-13
C	AR-3, AR-5, AR-7, AR-11, AR-18, AR-24, AR-27, AR-31, AR-33, AR-35 ARW-3, ARW-5, ARW-7, ARW-11, ARW-18, ARW-24, ARW-25, ARW-26, ARW-31, ARW-33, ARW-35, ARW-37	15-Oct-13	15-Dec-13