3.0 Affected Environment

This chapter describes the environmental baseline conditions in the area potentially affected by the Project. The BLM's NEPA Handbook (H-1790-1) requires that all EAs address certain Critical Elements of the Human Environment. These critical elements are presented in Chapters 3.0 and 4.0 where the element is discussed. The following elements do not occur within the Project area or would not be affected and therefore are not discussed further in the EA.

- ACECs;
- Hazardous or Solid Wastes;
- Prime or Unique Farmlands; and
- Wild and Scenic Rivers.

3.1 Climate and Air Quality

3.1.1 Climate

The climate in the Project area is characterized by large annual variations in temperature, low precipitation, and high winds. The Project crosses two ecological climate sub-regions as defined by the U.S. Department of Agriculture (USDA) Forest Service (USFS): the Great Plains-Palouse Steppe and the Intermountain Semi-Desert Provinces (McNab and Avers 1994). Roughly, the southwestern portion of the Project is within the Intermountain Semi-Desert Province and crosses into the Great Plains-Palouse Province at about MP 35. At MP 35, the Project descends from 6,000 feet above mean sea level (amsl) and into the plains. The two climate sub-regions have fairly similar climate, described as "cold continental with dry winters and warm summers. Temperature averages 39 to 45°Fahrenheit (F) (4 to 7°Celsius [C]). The growing season lasts 120 to 140 days." On average, the Great Plains-Palouse Province has slightly more precipitation than the Intermountain Semi-Desert Province (USFS 2008).

Climatological summaries of temperature and precipitation were examined for five stations near the Project area (listed from southwest to northeast): Jeffrey City, Casper, Midwest, Reno, and Weston (Western Regional Climate Center [WRCC] 2010). Comparative statistics are presented for all five stations in **Table 3-1**. Generally, temperature is more extreme at lower elevations, but the quantity and form of precipitation varies widely and does not follow any identifiable trend. Normals, means, and extremes in temperature, precipitation, and winds were examined for Casper, which is located southeast of the southern-most point of the Project route. The annual average maximum temperature is approximately 59 degrees Fahrenheit (°F), and the annual average minimum temperature is approximately 32°F. The record high temperature at Casper was 104°F in July 1954. The record low at Casper was -41°F in December 1990. The annual average total precipitation (water equivalent) is approximately 12 inches. Annual average snowfall at Casper is approximately 77 inches. The maximum monthly total of snow, ice pellets, and hail at Casper was 62.8 inches in December 1982. The mean wind speed at Casper was 12.8 miles per hour (mph), and the prevailing direction was from the southwest. The peak gust was 67 mph from the southwest and was recorded in January 1990.

Table 3-1 Climatological Measurements at Stations Near the Greencore Project

Station Name	Station Elevation (feet amsl)	Annual Average Precipitation (inches)	Annual Average Snowfall (inches)	Maximum Temperature (˚F)	Minimum Temperature (˚F)
Jeffrey City	6,340	10	57	98	-39
Casper	5,340	12	77	104	-41

Table 3-1 Climatological Measurements at Stations Near the Greencore Project

Station Name	Station Elevation (feet amsl)	Annual Average Precipitation (inches)	Annual Average Snowfall (inches)	Maximum Temperature (˚F)	Minimum Temperature (˚F)
Midwest	4,820	13	53	106	-40
Reno	5,080	11	22	103	-34
Weston	3,530	13	38	108	-47

3.1.2 Climate Change

3.1.2.1 Global Changes

Ongoing scientific research has identified the potential impacts of anthropogenic (man-made) greenhouse gas (GHG) emissions and changes in biological carbon sequestration due to land management activities on global climate. Through complex interactions on a regional and global scale, these GHG emissions and net losses of biological carbon sinks cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, recent industrialization and burning of fossil carbon sources have caused CO_2 equivalents (CO_2e) concentrations to increase dramatically and are likely to contribute to overall global climatic changes. The Intergovernmental Panel on Climate Change (IPCC) recently concluded that “warming of the climate system is unequivocal” and “most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentration” (IPCC 2007).

Global mean surface temperatures have increased nearly 1.8°F from 1890 to 2006. Models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Northern latitudes (above 24°N) have exhibited temperature increases of nearly 2.1°F since 1900, with nearly a 1.8°F increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHGs are likely to accelerate the rate of climate change.

In 2001, the IPCC indicated that by the year 2100, the global average surface temperatures would increase 2.5 to 10.4°F above 1990 levels. The National Academy of Sciences has confirmed these findings, but also has indicated there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature would not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than increases in daily maximum temperatures. Increases in temperatures would increase water vapor in the atmosphere, and reduce soil moisture, increasing generalized drought conditions, while at the same time enhancing heavy storm events. Although large-scale spatial shifts in precipitation distribution may occur, these changes are more uncertain and difficult to predict.

As with any field of scientific study, there are uncertainties associated with the science of climate change. This does not imply that scientists do not have confidence in many aspects of climate change science. Some aspects of the science are known with virtual certainty, because they are based on well-known physical laws and documents trends (U.S. Environmental Protection Agency [USEPA] 2008).

Several activities contribute to the phenomenon of climate change, including emissions of GHGs (especially carbon dioxide and methane) from fossil fuel development, large wildfires, and activities using combustion engines; changes to the natural carbon cycle; and changes to radiative forces and reflectivity (albedo). It is important to note that GHGs would have a sustained climatic impact over different temporal scales. For example, recent emissions of carbon dioxide can influence climate for 100 years.

It may be difficult to discern whether global climate change is already affecting resources, let alone the study area. In most cases there is more information about potential or projected effects of global climate change on

resources. It is important to note that projected changes are likely to occur over several decades to a century. Therefore, many of the projected changes associated with climate change may not be measurably discernable within the reasonably foreseeable future.

3.1.3 Air Quality

All counties through which the Project would cross (Campbell, Johnson, Natrona, and Fremont in Wyoming and Powder River in Montana) are classified as attainment (meeting air quality standards) for all pollutants. The Primary and Secondary National Ambient Air Quality Standards for inhalable particulate matter with an aerodynamic diameter of 10 microns (μ) or less (PM_{10}) are 150 micrograms/cubic meter ($\mu g/m^3$) over a 24-hour period and 50 $\mu g/m^3$ over a year, respectively. Campbell, Natrona, and Fremont counties currently have PM_{10} monitors. There are no monitoring sites in Johnson County. Annual average PM_{10} concentrations in these counties vary from approximately 17.5 $\mu g/m^3$ to approximately 33 $\mu g/m^3$ compared to the annual standard of 50 $\mu g/m^3$. The maximum 24-hour PM_{10} concentration measured in these counties since 1994 was 112 $\mu g/m^3$ in 1995 in Campbell County. This compares favorably with the 24-hour PM_{10} standard of 150 $\mu g/m^3$. Background concentrations of criteria pollutants that potentially would be released as a result of the Project are listed in **Table 3-2**.

Table 3-2 Background Concentrations of Air Pollutants[1]

Pollutant and Averaging Period	Background Concentration	Source[2]
Carbon monoxide (CO) 1-hour	3,336	A
CO 8-hour	1,381	A
Nitrogen dioxide (NO_2) annual	3.4	B
Ozone (O_3) 8-hour	147	C
PM_{10} 24-hour	51	D
PM_{10} annual	21	D
Particulate matter with an aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$) 24-hour	30	D
$PM_{2.5}$ annual	8	D
Sulfur dioxide (SO_2) 3-hour	93	E
SO_2 24-hour	32	E
SO_2 annual	4	E

[1] Devon Bairoil to Beaver Creek CO_2 Pipeline Project Environmental Assessment (BLM 2007b).

[2] A = Data collected by Amoco at Ryckman Creek for an 8 month period during 1978-1979, summarized in the Riley Ridge EIS (BLM 1983). B = Data collected at Green River Basin Visibility Study site during the period January – December 2001 (ARS 2002). C = Data collected at Green River Basin Visibility Study site during the period June 10, 1998 - December 31, 2001 (ARS 2001). Data represents the top tenth percentile maximum 1-hour value. D = Data collected by the WDEQ at Lander, Wyoming, 2005 (personal communication with WDEQ, February 13, 2007). Data may be affected by the use of woodstoves. E = Data collected at Lost Cabin Gas Plant (preconstruction monitoring) Fremont County, Wyoming;1986-1987 LaBarge Study Area at the Northwest Pipeline Craven Creek site, 1982-1983 (WDEQ). All short-term data are second-maximum values unless otherwise specified. Annual data represent averages.

3.2 Geology and Soils

3.2.1 Geology

3.2.1.1 Topography and Physiography

The Project is located in two physiographic provinces. From west to east along the Project route are the Wyoming Basins province and the Unglaciated Missouri Plateau section of the Great Plains province

(Wyoming State Geological Survey [WSGS] 2010a,b,c). The Wyoming Basin province is characterized by plateaus and isolated mountain ranges and generally occupies the southwestern third of Wyoming (**Figure 3-1**). The Unglaciated Missouri Plateau consists of plateaus, terraces, badlands, and isolated mountain ranges. The proposed pipeline route begins in the Wyoming Basins province and enters the Unglaciated Missouri Plateau section in the vicinity of Arminto, Wyoming. Elevations along the proposed route range from 5,000 to 6,300 feet amsl from Lost Cabin to around Waltman, Wyoming. From Waltman to north of Gillette, Wyoming, elevations generally range from 5,500 feet to 4,000 feet amsl, with much variation as the route crosses corrugated and rolling hill topography. East of U.S. Highway 14 north of Gillette, the elevations drop below 4,000 feet amsl and where the Project terminates at Bell Creek, Montana, the elevation is about 3,680 feet amsl.

3.2.1.2 Stratigraphy

The bedrock geology consists of upper Cretaceous and lower Tertiary rocks along the length of the Project. **Table 3-3** lists the formations and deposits crossed by the proposed route.

Table 3-3 Geologic Formation and Deposits

Formation-Unit/Symbol	Period	Description
Alluvium, terrace, wind-blown deposits	Recent	Unconsolidated clay, silt sand, and gravels.
Wind River Formation	Lower Tertiary – Eocene	Poorly sorted sandstones and conglomerates with red to gray mudstones.
Mesaverde Formation	Upper Cretaceous	A highly variable unit consisting of lenticular sands, shale, siltstone, and coals.
Cody Shale	Upper Cretaceous	Dark gray shale with sandstone lenses in the lower part and fossiliferous beds in the upper part.
Fox Hills Sandstone	Upper Cretaceous	Light-colored fine to course-grained sandstone with interbedded siltstone and shale.
Lewis Shale	Upper Cretaceous	Dark gray marine shale becoming sandy at the top with interbedded carbonaceous shale and coal.
Fort Union Formation – Tullock Member	Lower Tertiary – Paleocene	Sandstone, mudstone, and coals.
Fort Union Formation – Lebo Member	Lower Tertiary – Paleocene	Shale with interbedded sandstone.
Wasatch Formation	Lower Tertiary - Paleocene	Interbedded sandstone and shale, claystone, and siltstone, carbonaceous shale, and coals.
Lance – Hell Creek Formations	Upper Cretaceous	Sandstones, carbonaceous shale, and coal. The Lance and Hell Creek Formations are equivalent; Hell Creek is used in the northeast Powder River Basin in Montana.

Sources: Love and Christiansen (1985); Watson (1980); Vuke et al. (2001); Winterfeld (2010).

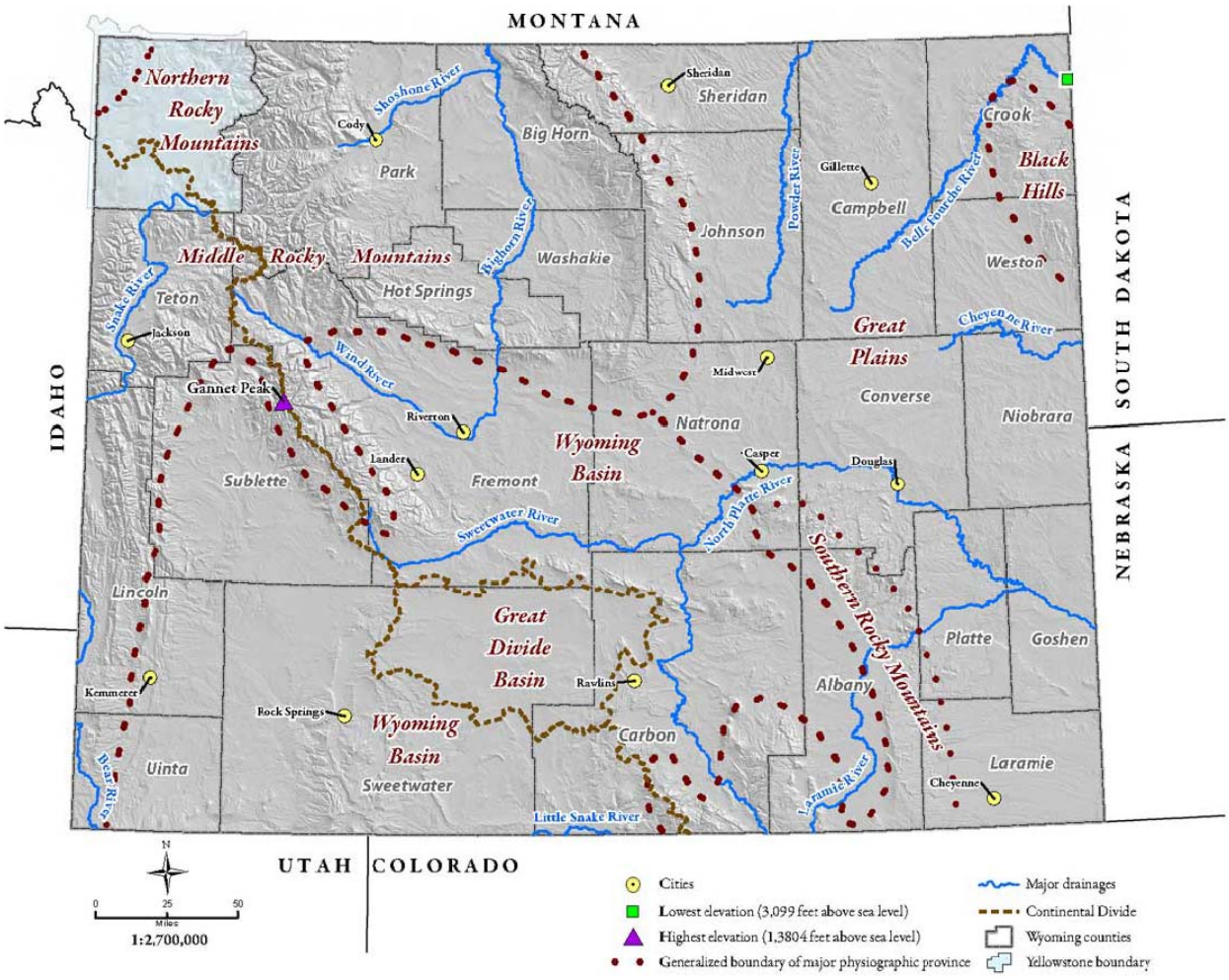


Figure 3-1 Physiographic Provinces of Wyoming

The Project lies in three structural domains: the Wind River Basin, the Casper Arch, and the Powder River Basin. The Wind River and Powder River Basins were created during the Laramide Orogeny that occurred at the end of Cretaceous time (**Figure 3-2**). The basins are asymmetric and contain thousands of feet of sedimentary rocks of varying lithologies and ages. At Lost Cabin, the Wind River Basin is near its deepest point and the sedimentary rock section is about 25,000 to 30,000 feet thick (Kent 1972). The Project crosses the Casper Arch between Waltman to just south of Sussex. The Casper Arch is an anticline-type of structural flexure that separates the Wind River Basin from the Powder River Basin and is a low-relief continuum between the north end of the Laramie Mountains that terminates at Casper, Wyoming, and the southern end of the Big Horn Mountains, 100 miles north of Casper. In the Powder River Basin, there is over 17,000 feet of sedimentary rock. In both the Wind River and Powder River Basins, the sedimentary rocks and deposits range in age from Cambrian to recent (Love et al. 1993).

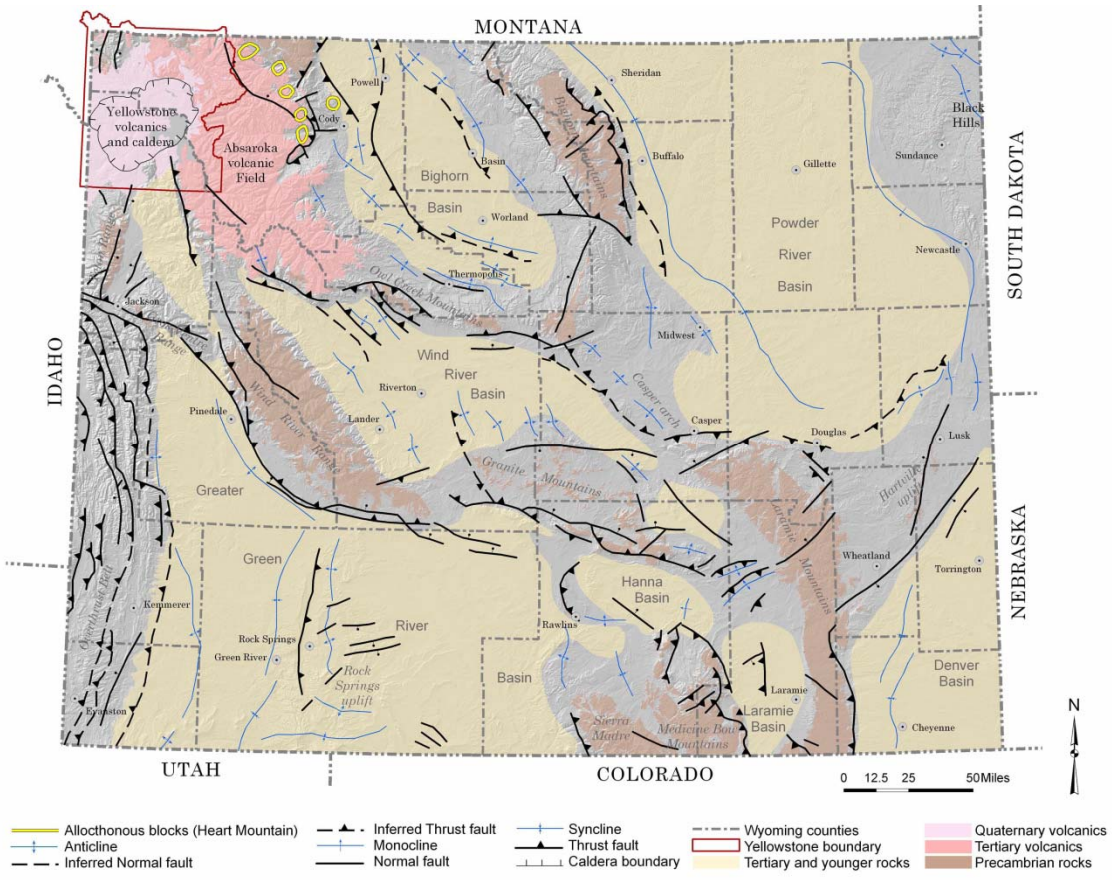


Figure 3-2 Structural Elements of Wyoming. Source: Wyoming State Geological Survey 2010a

Along the boundary between the Wind River Basin and the Casper arch is a series of deep reverse faults, while along the east boundary of the Casper Arch there is much less deformation (**Figure 3-2**). Reverse faults may be present at depth as the sedimentary strata dip down into the Powder River Basin.

3.2.1.3 Geological Hazards

Active Faults and Earthquakes

Faults are dislocations in the earth's crust and movement along faults is a primary cause of earthquakes. Faults have been mapped in geologic units of all ages, but many of the faults are not active. An active fault is defined as a fault that has had movement within the last 11,000 years (Holocene or Recent). There is an active fault called the Stagner Creek Fault to the west of Lost Cabin (Machette 1999). The Stagner Creek Fault trends northwest for about 18 miles, beginning just west of Lost Cabin. There is evidence for Holocene movement that consists of a 2-mile-wide area of surface displacement along the fault. There are no active faults along the Project and it does not cross the Stagner Creek Fault zone. The Project crosses the deep reverse faults along the west side of the Casper Arch, but these faults are not considered to be active.

The Project is in an area that is relatively quiet for earthquakes. A search of the U.S. Geological Survey (USGS) earthquake catalogue (1973 to present) showed 106 events in a circular area centered on MP 140 with a 162-mile radius. These earthquakes were mainly small magnitude events, but the strongest was a magnitude 5.5 (Richter Scale) that was recorded in 1984 in the north end of the Laramie Mountains, about 60 miles southeast of MP 50.

The USGS seismic hazard mapping indicates that ground motion in the Project area from a maximum credible earthquake would be less than 10 percent of the acceleration of gravity, with a 10 percent probability of exceedance in 50 years (Petersen et al. 2008).

Landslides

The Project crosses areas that may be susceptible to landslides (WSGS 2010b). There are numerous landslides in the area crossed by the Project in northeastern Campbell County. Most are small (several acres), but can be up to 40 acres and are generally block slides involving bedrock and unconsolidated materials on the slopes of buttes or drainages where the bedrock is the Fort Union Formation. The Project itself, however, does not cross documented landslides.

Subsidence

Ground subsidence may be caused by the dissolution of certain kinds of strata that result in subsurface voids that propagate to the surface or from the withdrawal of fluids such as groundwater or oil and gas. No subsidence hazards due to dissolution have been documented in the Project area (National Atlas 2009). Although large amounts of groundwater have been withdrawn for coal bed natural gas production, no surface subsidence effects have been documented in the Powder River Basin (WSGS 2010c)

3.2.2 Soils

The Project is located within the following 4 Major Land Resource Areas (MLRAs) of soil resources (USDA 2006):

- MLRA 32 – Northern Intermountain Desertic Basins;
- MLRA 34A – Cool Central Desertic Basins and Plateaus;
- MLRA 58A – Northern Rolling High Plains, Northern Part; and
- MLRA 58B – Northern Rolling High Plains, Southern Part.

The Northern Intermountain Desertic Basins MLRA is located from approximately MP 0.0 to MP 5.1 and MP 7.2 to MP 7.9. The soils generally are shallow to very deep, well drained, and loamy. The MLRA is in a syncline between anticlinal mountain ranges with elevations ranging from 3,900 to 5,900 feet. The average

annual precipitation in most parts of the basins is 6 to 12 inches, but can reach 22 inches in the higher areas within the basins. The freeze-free season ranges from 110 to 180 days.

The Cool Central Desertic Basins and Plateaus MLRA is located from approximately MP 5.1 to MP 7.2 and MP 7.9 to MP 45.4. The soils formed in slope alluvium or residuum derived from shale or sandstone. Soils that formed in stream- or river-deposited alluvium are near the major waterways. Generally, the soils are well drained and are calcareous. This area is bounded on most sides by mountains with elevations ranging from 5,200 feet to 7,500 feet. The average annual precipitation generally is 7 to 12 inches, but it ranges from 7 to 32 inches with a freeze-free season of 45 to 160 days.

The Northern Rolling High Plains (Northern Part) MLRA is located from approximately MP 220.3 to MP 231.1. The soils are generally shallow to very deep, well drained, and clayey or loamy. This area consists of gently rolling to steep eroded plateaus and terraces underlain by shale, siltstone, and sandstone, including areas of steep badlands bordering major streams and intermittent drainageways. Elevations range from approximately 2,950 to 3,280 feet, with an average annual precipitation of 8 to 22 inches, and a frost-free season of about 115 to 190 days.

The Northern Rolling High Plains (Southern Part) MLRA is located from approximately MP 45.4 to MP 220.3. The soils are generally shallow to very deep, well drained, and clayey or loamy. This area consists of gently rolling to steep eroded plateaus and terraces underlain by shale, siltstone, and sandstone, including areas of steep badlands bordering major streams and intermittent drainageways. Elevations range from approximately 2,950 to 5,900 feet, with an average annual precipitation of 9 to 27 inches, and a frost-free season of about 115 to 70 days.

Baseline information used to characterize soils was derived from Soil Survey Geographic (SSURGO) database review and analyses. SSURGO is the most detailed level of soil mapping done by the Natural Resources Conservation Service (NRCS) (Soil Survey Staff 2010). The data for North Johnson County are draft, and have not been correlated. The various soil map units within the Project area were combined into generalized groups of soils to evaluate potential impacts and to determine effective erosion control measures, reclamation, and revegetation potential in the area. Soils that are particularly susceptible to impacts and that may be disturbed during construction are considered “fragile” soils. Delineation of fragile soils was based on the following BLM criteria (BLM 2001):

- Shallow over bedrock (less than 20 inches);
- Underlain by lithic (hard) bedrock;
- Sand, loamy sand, or clay-textured surface and subsoil layers;
- Soils containing more than 35 percent coarse fragments by volume;
- Permeability less than 0.6 inch per hour;
- Water table less than 72 inches;
- Soil pH greater than 8.5, salinity more than 16 millimhos in the upper 40 inches; and
- Occupying slopes steeper than 15 percent.

While the potential for having a slope limitation is indicated by the soil map unit, actual steep slope locations also were identified (from 1:24,000 topographic maps) by MP locations along the Project route. Only significant areas of steep slopes (i.e., areas of at least 0.1 mile long) were identified. A list of sensitive soils is provided in **Appendix C**.

NRCS Order 3 soil surveys for Fremont, Natrona, Johnson, Campbell, and Powder River counties were used to characterize the types of soils crossed by the Project. In general, soils along the ROW in Fremont County are prone to water and wind erosion and range from loamy sand to clay loam textures. Depth to paralithic (soft) bedrock is variable and no shallow lithic bedrock is encountered in Fremont County. Depth to water is generally deep with the exception of the locations listed in **Appendix C**. Soils in Natrona county are generally

prone to water erosion and moderately erodible by wind. Soil textures range from clay to loamy sand. Depth to paralithic bedrock is variable and no shallow lithic bedrock is encountered by the Project. Depth to water is generally deep with the exception of the locations listed in **Appendix C**. In Johnson County, soils are generally erodible by water and moderately erodible by wind. Depth to paralithic bedrock is variable and only one location encountered shallow lithic bedrock along the ROW between MP 118.3 and MP 118.7. Depth to water is generally deep with the exception of the locations listed in **Appendix C**. Soil textures range from silty clay to loamy sand. Soils along the Project in southern Campbell county are slightly to highly erodible by wind and water and range from clay loam to loamy sand. Depth to paralithic (soft) bedrock is variable and no shallow lithic bedrock is encountered. Depth to water is generally deep with the exception of the locations listed in **Appendix C**. Soils along the Project in northern Campbell County generally are highly erodible by water and slightly to moderately erodible by wind. Soil textures range from clay loam to fine sandy loam. Depth to paralithic (soft) bedrock is variable and no shallow lithic bedrock is encountered. Depth to water is generally deep with the exception of the locations listed in **Appendix C**. Soils along the route in Powder River County are generally highly erodible by water and slightly to moderately erodible by wind. Soil textures range from silty clay loam to fine sandy loam. Depth to paralithic (soft) bedrock is variable and no shallow lithic bedrock is encountered. Depth to water is generally deep.

Soil limitations as they relate to pipeline operation and/or construction (limitations such as a high erosion potential or shallow depth to bedrock) are discussed in Chapter 4.0.

3.3 Mineral and Paleontological Resources

3.3.1 Mineral Resources

The major mineral resources in the vicinity of the Project are oil and gas (including coal bed natural gas [CBNG]), coal, uranium, bentonite, and aggregates (sand and gravel and clinker) (BLM 2009a,b, 2004).

3.3.1.1 Oil and Gas Resources

The Wind River Basin and the Powder River Basin are both prolific oil and gas producing areas. Cumulatively, the Wind River and Powder River basins have produced about 3.7 billion barrels of oil and 12.4 trillion cubic feet of gas (Dolton and Fox 1995; Fox and Dolton 1995; Wyoming Oil and Gas Conservation Commission 2010). **Table 3-4** provides a list of oil and gas fields crossed by the proposed route.

Table 3-4 Oil and Gas Fields Crossed by the Greencore Project

Approximate Milepost	Primary Product	Field Name
0.0 to 1.1	Gas	Lost Cabin
1.1 to 3.2	Gas	Madden – Lost Cabin
3.3 to 5.2	Gas	Cedar Gap
23.2 to 26.1	Gas	Waltman
39.6 to 39.6	Oil	Clark Ranch
79.6 to 80.2	Oil	Smokey Gap
100.2 to 101.3	Oil	Sussex
105.0 to 190.0	Gas	Powder River Basin Cbng
116.8 to 120.3	Oil	Jepson Draw, Nipple
143.9 to 144.6	Shut-In	Bugher Draw
148.5 to 149.3	Oil	Barber Creek, Dead Horse Creek South
161.2 to 163.8	Gas	Kingsbury Creek

Table 3-4 Oil and Gas Fields Crossed by the Greencore Project

Approximate Milepost	Primary Product	Field Name
170.1 to 176.3	Oil	Kitty
187.4 to 188.4	Shut-In	Squaw Creek, Gas Draw
225.0 to 230.0	Oil	Bell Creek

Sources: De Bruin (2002); Montana Board of Oil and Gas; Wyoming Oil and Gas Conservation Commission (2010).

3.3.1.2 Coal

The Project crosses outcrops containing coal in the Fort Union, Wasatch, and Mesaverde Formations. Both the Wind River and Powder River basins contain coal resources, but the Powder River Basin produces large amounts of coal. The Powder River Basin produced 446.5 million tons of coal in 2008, which accounted for 97 percent of Wyoming's coal production (BLM 2009a). The Tongue River and Lebo Members of the Fort Union Formation contain most of the coal reserves. Wasatch Formation coals are thinner and of lesser quality. The Project crosses areas of high development potential for coal north of Gillette from MP 175.0 to MP 190.0 (BLM 2009a). However, the Project does not cross active coal leases and mining areas. The Project also crosses coal-bearing rocks east of Waltman in the Fort Union and Mesaverde formations, but these coals are thin and have low mineable potential (BLM 2009b).

3.3.1.3 Uranium

Uranium also is a valuable mineral resource in the Wind River and Powder River Basins. The Powder River Basin hosts the only recently active in-situ uranium mining project in Wyoming – Smith Ranch. In-situ mining of uranium involves injecting solutions into deposits containing high values of uranium, leaching the deposit of the uranium, and pumping the uranium-laden solutions to the surface for processing. The Smith Ranch in-situ uranium project is located in Converse County and has produced over 28.9 million pounds of uranium (Wyoming Department of Revenue 2010a). There are no active uranium mines in the Wind River Basin. With the increase in demand and prices for uranium, a number of uranium exploration permits have been issued and some operators have applied for uranium recovery licenses from the U.S. Nuclear Regulatory Commission. The Project does not cross uranium exploration areas or areas of uranium development potential, although it skirts the west boundary of the Pumpkin Buttes Uranium District and the proposed Christen Ranch – Irigaray in situ recovery uranium project (COGEMA Mining, Inc.).

3.3.1.4 Bentonite

Bentonite is a clay mineral that results from the alteration of volcanic ash (BLM 2009a, 2004). Bentonite is an industrial mineral that has a number of uses, the most common as a main ingredient in drilling fluids. Bentonite is common in the Cretaceous rocks of Wyoming and is mined in several areas including the Powder River Basin. Bentonite is mined in southwestern Johnson County, but the Project, while crossing upper Cretaceous rocks that may contain bentonite, does not cross bentonite mining permit areas.

3.3.1.5 Aggregate

Sand and gravel deposits are found in alluvium associated with the major drainages (BLM 2009a,b, 2004). Clinker is rock adjacent to coal beds that has been altered when the coal has burned. Clinker is used as a road base and landscaping material (BLM 2009a). Clinker is common in the Powder River Basin and is especially prevalent along the coal outcrop in eastern Campbell County. There are no federally permitted gravel (mineral material) pits within 200 feet of the Project (BLM 2010d).

3.3.2 Paleontological Resources

3.3.3 Study Area

The study area for paleontological resources consists of the Project ROW (**Figure 1-1**), the access roads, ATWS, and ancillary facilities.

3.3.4 Regulatory Structure

Federal legislative protection for paleontological resources stems from the Antiquities Act of 1906 (Public Law [PL] 59-209; 16 U.S.C. 431 et seq.; 34 Stat. 225), which calls for protection of historic landmarks, historic and prehistoric structures, and other objects of historic or scientific interest on federally administered lands. Federal protection for scientifically important paleontological resources would apply to construction or other related impacts that would occur on federally owned or managed lands. Another federal law regulating paleontological resources is the Archaeological and Paleontological Salvage Act (23 U.S.C. 305). The act provides for funding for mitigation of paleontological resources discovered during Federal aid highway projects, provided that "excavated objects and information are to be used for public purposes without private gain to any individual or organization". In addition to the foregoing, the National Registry of Natural Landmarks provides protection to paleontological resources.

The BLM manages paleontological resources (fossils) on federal lands under the following statutes and regulations (BLM 2010e):

- Federal Land Policy and Management Act of 1976 (PL 94-579);
- National Environmental Policy Act of 1969 (PL 91-190);
- Various sections of BLM's regulations found in CFR Title 43 that address the collection of invertebrate fossils and, by administrative extension, fossil plants; and
- A recently enacted statute, the Paleontological Resources Preservation Act (PRPA), was passed in March 2009. The law authorizes the BLM and USFS to manage and provide protection to fossil resources using "scientific principles and expertise" (BLM 2010e).

In addition to the statutes and regulations listed above, fossils on public lands are managed through the use of internal BLM guidance and manuals. Included among these are the BLM Manual 8270 and the BLM Handbook H-8270-1 (BLM 2010e). Various internal instructional memoranda have been issued to provide guidance to the BLM in implementing management and protection to fossil resources.

3.3.5 Potential Fossil Yield Classification

Recently, the BLM has adopted the Potential Fossil Yield Classification (PFYC) system to identify and classify fossil resources on federal lands (BLM 2007c). Paleontological resources are closely tied to the geologic units (i.e., formations, members, or beds) that contain them. The probability for finding paleontological resources can be broadly predicted from the geologic units present at or near the surface. Therefore, geologic mapping can be used for assessing the potential for the occurrence of paleontological resources.

The PFYC system is a way of classifying geologic units based on the relative abundance of vertebrate fossils or scientifically significant fossils (plants and invertebrates) and their sensitivity to adverse impacts. A higher class number indicates higher potential. The PFYC is not intended to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher class; instead, the relative abundance of significant localities is intended to be the major determinant for the class assignment.

The PFYC system is meant to provide baseline guidance for predicting, assessing, and mitigating paleontological resources. The classification should be considered at an intermediate point in the analysis, and should be used to assist in determining the need for further mitigation assessment or actions. The BLM intends

for the PFYC System to be used as a guideline as opposed to rigorous definitions. Descriptions of the potential fossil yield classes are summarized in **Table 3-5**.

Table 3-5 Potential Fossil Yield Classification

Class	Description	Basis	Comments
1	Igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservation environments that are not likely to contain recognizable fossil remains.	Fossils of any kind known not to occur except in the rarest of circumstances. Igneous or metamorphic origin. Landslides and glacial deposits.	The land manager's concern for paleontological resources on Class 1 acres is negligible. Ground disturbing activities would not require mitigation except in rare circumstances.
2	Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant invertebrate fossils.	Vertebrate fossils known to occur very rarely or not at all. Age greater than Devonian. Age younger than 10,000 years before present. Deep marine origin. Aeolian origin. Digenetic alteration.	The land manager's concern for paleontological resources on Class 2 acres is low. Ground disturbing activities are not likely to require mitigation.
3	Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.	Units with sporadic known occurrences of vertebrate fossils. Vertebrate fossils and significant invertebrate fossils known to occur inconsistently; predictability known to be low. Poorly studied and/or poorly documented. Potential yield cannot be assigned without ground reconnaissance.	The land manager's concern for paleontological resources on Class 3 acres may extend across the entire range of management. Ground disturbing activities would require sufficient mitigation to determine whether significant paleontological resources occur in the area of a proposed action. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.
4	Class 4 geologic units are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation.	Significant soil/vegetative cover; outcrop is not likely to be impacted. Areas of any exposed outcrop are smaller than two contiguous acres. Outcrop forms cliffs of sufficient height and slope that most is out of reach by normal means. Other characteristics that lower the vulnerability of both known and unidentified fossil localities.	The land manager's concern for paleontological resources on Class 4 acres is toward management and away from unregulated access. Proposed ground disturbing activities would require assessment to determine whether significant paleontological resources occur in the area of a proposed action and whether the action would impact the paleontological resources. Mitigation beyond initial findings would range from no further mitigation necessary to full and continuous monitoring of significant localities during the action.

Table 3-5 Potential Fossil Yield Classification

Class	Description	Basis	Comments
5	Highly fossiliferous geologic units that regularly and predictably produce invertebrate fossils and/or scientifically significant invertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.	Vertebrate fossils and/or scientifically significant invertebrate fossils are known and documented to occur consistently, predictably, and/or abundantly. Unit is exposed; little or no soil/vegetative cover. Outcrop areas are extensive; discontinuous areas are larger than 2 contiguous acres. Outcrop erodes readily; may form badlands. Easy access to extensive outcrop in remote areas. Other characteristics that increase the sensitivity of both known and unidentified fossil localities.	The land manager's highest concern for paleontological resources should focus on Class 5 acres. Mitigation of ground disturbing activities is required and may be intense. Areas of special interest and concern should be designated and intensely managed.

Sources: BLM 2008, 2007c.

3.3.6 Fossil Potential

The bedrock formations crossed by the Project all have moderate to high fossil potential except for Recent unconsolidated deposits that have low potential. The fossil potential is summarized in **Table 3-6**.

Table 3-6 Paleontological Resources Potential

Formation-Deposit	Period	PFYC Rating	Fossil Types
Alluvium, terrace, wind-blown deposits	Recent	1 to 2	Not determined.
Wind River Formation	Lower Tertiary – Eocene	4 to 5	Vertebrates, invertebrates, and plants.
Mesaverde Formation	Upper Cretaceous	3	Vertebrates, invertebrates, and plants, and trace fossils.
Cody Shale	Upper Cretaceous	3	Vertebrates, invertebrates, and trace fossils.
Fox Hills Sandstone	Upper Cretaceous	3	Vertebrates, invertebrates, and trace fossils.
Lewis Shale	Upper Cretaceous	3	Vertebrates, invertebrates, and trace fossils.

Table 3-6 Paleontological Resources Potential

Formation-Deposit	Period	PFYC Rating	Fossil Types
Fort Union Formation – Tullock Member	Lower Tertiary – Paleocene	3	Vertebrates, invertebrates, plants, and trace fossils.
Fort Union Formation - Lebo Member	Lower Tertiary – Paleocene	3	Vertebrates, invertebrates, plants, and trace fossils.
Wasatch Formation	Lower Tertiary – Paleocene	4 to 5	Vertebrates, invertebrates, plants, and trace fossils.
Fort Union – Tongue River and Lebo Members	Lower Tertiary – Paleocene	3	Vertebrates, invertebrates, plants, and trace fossils.
Lance - Hell Creek Formations	Upper Cretaceous	4 to 5	Vertebrates, invertebrates, plants, and trace fossils.

Sources: Love and Christiansen 1985; Vuke et al. 2001; Winterfeld 2010.

3.4 Water Resources

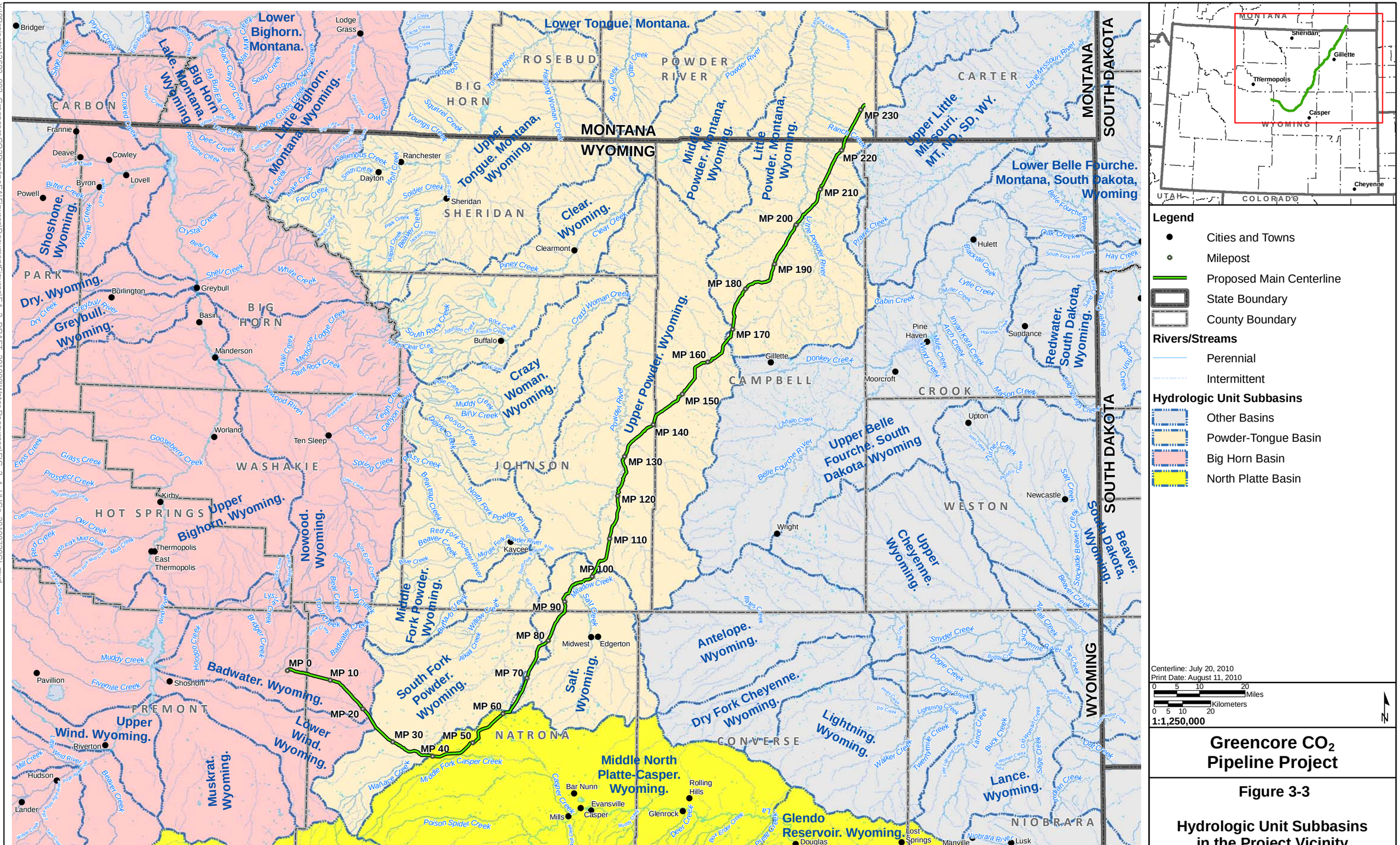
3.4.1 Surface Water

The Project would be located entirely within the Missouri River water resources region according to the USGS Hydrologic Unit Code (HUC) dataset (Watermolen 2002). **Table 3-7** details the basins and subbasins the Project would cross. **Figure 3-3** depicts the Project as it traverses these basins and subbasins. The first portion of the Project route, beginning at the Lost Cabin Gas Plant, would be located within the Badwater and Lower Wind Subbasins of the Big Horn River Basin. The route would continue southeast and cross within the South Fork Powder Subbasin of the Powder River Basin. The Project would cross Middle North Platte-Casper Subbasin of the North Platte River Basin, turn to the north, northeast, and re-enter the Powder River Basin to the Project termination point at Bell Creek Field. Subbasins that would be crossed by this latter traverse of the Powder River Basin would include South Fork Powder, Salt, Upper Powder, and Little Powder subbasins.

Table 3-7 Hydrologic Units Crossed by the Greencore Project

Region	Basin	Subbasin	HUC8 Code	From MP	To MP	Length (miles)
Missouri River	Big Horn River	Badwater, Wyoming	10080006	0.0	22.4	22.4
		Lower Wind, Wyoming	10080005	22.4	24.8	2.4
	Powder River	South Fork Powder, Wyoming	10090203	24.8	38.9	14.1
	North Platte River	Middle North Platte-Casper, Wyoming	10180007	38.9	60.9	22.0
	Powder River	South Fork Powder, Wyoming	10090203	60.9	61.4	0.4
		Salt, Wyoming,	10090204	61.4	71.5	10.2
		South Fork Powder, Wyoming,	10090203	71.5	78.9	7.3
		Salt, Wyoming,	10090204	78.9	101.5	22.6
		Upper Powder, Wyoming,	10090202	101.5	166.8	65.3
		Little Powder, Montana, Wyoming	10090208	166.8	231.1	64.8

Source: Watermolen 2002.



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The Project would cross 18 perennial streams (1 or more times) that were identified by global positioning system and classified during on-the-ground field surveys conducted during the summer months of 2009 and 2010. The perennial streams that would be crossed by the Project are listed in **Table 3-8**. Numerous intermittent and ephemeral streams and minor drainages (approximately 200), also would be crossed by the Project. **Table 3-9** provides a summary of the number of streams crossed. **Appendix D** contains a complete tabulation of all waterbodies crossed or lying within the proposed temporary ROW of the Project. No wild or scenic rivers would be crossed by the Project.

The Little Powder River at approximately MP 203.1 is the most significant surface water resource that would be crossed by the Project. This river is rated Class 2AB by the WDEQ at this location, which is the most stringent classification crossed by the Project and indicates the stream supports game-fish populations. Average monthly stream discharges reported by the USGS from 1972 to 2008 at the Little Powder River above Dry Creek, near the Weston, Wyoming station ranged from 2.4 cubic feet per second (cfs) in December to 63 cfs in May. The maximum recorded streamflow during the same time was 5,300 cfs on May 19, 1978. In most years, discharges usually ranged from less than 1 cfs up to 1,000 cfs or more. Peak flows generally occurred in early spring.

Table 3-8 Perennial Streams Crossed One or More Times by the Greencore Project

Stream Name	Water Quality Classification	State	Subbasin	MP Number
South Fork Powder River	2C	Wyoming	South Fork Powder	36.7
Scott Creek	Not listed	Wyoming	Salt	83.2
Salt Creek	2C	Wyoming	Salt	95.5
Meadow Creek	2C	Wyoming	Salt	96.6–97.5
Carpenter Draw	Not listed	Wyoming	Upper Powder	104.1
Dry Fork Powder River	3B	Wyoming	Upper Powder	113.7
Pumpkin Creek	3B	Wyoming	Upper Powder	132.3
Beaver Creek	3B	Wyoming	Upper Powder	140.1
South Draw	Not listed	Wyoming	Upper Powder	147.0–147.1
North Prong Deadhorse Creek	3B	Wyoming	Upper Powder	148.5–148.6
Kingsbury Creek	3B	Wyoming	Upper Powder	160.0
Wild Horse Creek	3B	Wyoming	Upper Powder	161.4
Road Creek	Not listed	Wyoming	Little Powder	175.9
Horse Creek	3B	Wyoming	Little Powder	199.3–199.4
Little Powder River	2AB	Wyoming	Little Powder	203.1
Trail Creek	3B	Wyoming	Little Powder	218.3
Ranch Creek	B-2	Montana	Little Powder	225.2–225.3
Bell Creek	B-2	Montana	Little Powder	231.1

[1] According to the Wyoming Surface Water Classification List (WDEQ 2001), “the classification list does not contain an exhaustive listing of all the surface waters in the state. Those not specifically listed are classified as follows: Those waters supported by an approved UAA containing defensible reasons for not protecting aquatic life uses shall be 4A, 4B or 4C; the remaining waters shall be 3A, 3B or 3C.”

Table 3-9 Count of Waterbodies Crossed[1] by the Greencore Project

	Ephemeral	Intermittent	Open Water	Perennial	Grand Total
Wyoming					
Fremont County	5	1	0	0	6
Natrona County	83	22	0	2	107
Johnson County	26	4	2	8	40
Campbell County	41	20	1	8	70
Montana					
Powder River County	0	0	0	2	2
Total	**155**	**47**	**3**	**20**	**225**

[1] Table count considers multiple crossings of one waterbody separately (i.e., of the 18 perennial streams, 2 are crossed twice).

3.4.1.1 Surface Water Quality

In Wyoming, 4 major classes of surface water, with various subcategories within each class, are identified by the Wyoming Department of Environmental Quality, Water Quality Division (WDEQ 2007). Wyoming waters are individually classified to 1 of the 4 major water quality classifications with Class 1 being the highest quality, and Class 4 the lowest. Montana Department of Environmental Quality classifies surface waters by drainage or tributary segments into 3 common and 6 uncommon major classes, with subcategories within most classes (MDEQ 2006a). Of the 3 common major classifications in Montana, Class A is the highest quality and Class C is the lowest. The streams crossed by the Project generally are classified as either Class 3 or 4 in Wyoming with only several exceptions of Class 2 waters and as Class B in Montana (**Table 3-8** and **Appendix D**), under the appropriate water quality standards. A narrative description of the major water quality classifications is included in **Appendix D** (WDEQ 2007; MDEQ 2006a).

Water quality standards for surface water in both states also establish numerical criteria for pH, turbidity, dissolved oxygen, and temperature along with a list of pollutants. The standards in Wyoming require “toxic materials attributable to or influenced by the activities of man shall not be present in any Wyoming surface water in concentrations or combinations which constitute ‘pollution.’” The standards continue on to define the levels or concentrations that constitute said pollution (WDEQ 2007). In Montana, MDEQ has established numeric water quality parameters for pollutants that are categorized as toxic, carcinogenic, bioconcentrating, radioactive, nutrient, or harmful (MDEQ 2008).

3.4.1.2 Water Use

Water use in the state of Wyoming is managed by the Wyoming State Engineer’s Office (WSEO). The North Platte River Basin’s water resources are highly appropriated and have special conditions restricting new uses of water according to stipulations of the Nebraska v. Wyoming Modified North Platte Decree and the Platte River Cooperative Agreement (U.S. Supreme Court 2001). Water in the North Platte Basin has been fully appropriated, and these agreements effectively prevent the development of new uses with the exception of stock, domestic, and municipal uses.

The Montana Department of Natural Resources and Conservation, Water Resources Division manages the use and conservation of water in the State of Montana.

3.4.1.3 Floodplains

A floodplain is defined as the low-lying area near a waterway or drainage that can be expected to be inundated by high flows in a given recurrence interval. The Federal Emergency Management Agency (FEMA) maintains and updates floodplain maps through the National Flood Insurance Program. These maps have limited availability in areas of low population, such as the Project area. They are produced in several formats, including paper maps, scanned images for use in Geographic Information System (GIS), and in fully-digital and attributed polygon files also for use in GIS (Q3 data). Both scanned maps and Q3 data were available for portions of the Project area. Where these sources were not available, USGS 1:24,000 topographic maps were analyzed to determine low-lying, flood-prone areas.

No areas with a high risk of flood (100-year floodplain or 1 percent chance of flood in any given year) would be crossed in Fremont County (FEMA 2002) or Natrona County (FEMA 1996). The USGS 1:24,000 topographic maps in Johnson County named “Dead Woman Crossing” and “Hoe Ranch,” were analyzed in lieu of FEMA maps because they were unavailable. The topographic maps indicate that the Project would potentially cross flood-prone areas at Salt Creek and along the Powder River floodplain, respectively. FEMA Q3 digital flood data for Campbell County (FEMA 2008) indicate the Project would cross the 100-year floodplain of Wild Horse and Boxelder creeks, Wildcat Creek floodplain, Little Power River, Duck Creek, and Antelope Creek floodplains. The available data for Powder River County, Montana (FEMA 1979), indicate that no high-risk flood areas would be crossed in that county by the Project.

3.4.2 Groundwater

Groundwater along the Project occurs in river alluvium and consolidated geologic deposits of sandstone, lignite, shale, and limestone. The only major alluvial aquifer system that would be crossed by the Project is the Little Powder River crossing (Zelt et al. 1999). Other minor alluvial aquifers occur at Salt Creek and the Powder River (Hodson et al. 1973).

Alluvial deposits can potentially yield 1,000 gallons per minute, depending on saturated thickness and grain composition. Alluvial deposits are composed of unconsolidated silt, sand, and gravel (Hodson et al. 1973). The water level is usually within a few feet of the water’s elevation in the stream.

Other groundwater formations underlying the Project route are characterized by water-bearing units that occur at greater depths than alluvial deposits. These units are of Tertiary and Cretaceous age and are composed of semi-consolidated to consolidated sandstone interbedded with shale and coal. They are commonly known as the Fort Union Formation, the Hell Creek Formation, and the Fox Hills Sandstone. Wells that have been drilled in these aquifers indicated depths to groundwater measuring 300 to 900 feet below ground surface (Whitehead 1996).

3.4.2.1 Groundwater Quality

Groundwater in Montana and Wyoming has been classified in order to apply standards to protect water quality. Groundwater within each state is classified by use and by ambient water quality. A summary of groundwater classifications in each state is included in **Appendix D** (MDEQ 2006b; WDEQ 2005).

Groundwater quality along the Project generally is poor with total dissolved solids frequently exceeding 1,000 milligrams per liter (mg/L) in the southern portions, and generally between 500 and 1,000 mg/L in the northern portions. These values generally constitute Class II or III groundwater within the Project area. Groundwater types consist of sodium-sulfate along the southern portions of the Project and sodium-bicarbonate towards the northern portions (Hodson et al. 1973).

3.5 Vegetation, Wetlands, Agriculture, and Range Resources

3.5.1 Vegetation and Wetlands

The Project area is located entirely within the Powder River Basin floristic region of northeastern Wyoming and southeastern Montana, and characterized by flat to low rolling terrain with intermittent terraces, steep slopes,

and rocky ridges. Vegetation community characterizations were compiled from aerial photograph interpretation and field verification of each land use-land cover type. Five vegetation cover types occur within the Project area and include grassland/shrubland (i.e., rangeland), upland forest/woodland, agriculture, riparian, and developed lands. Distribution and composition of each vegetation cover type varies based on landscape position, soil type, climatic conditions, moisture, elevation, aspect, and grazing and land management practices. Descriptions of the plant communities within each vegetation cover type are provided in the following text. Species nomenclature is consistent with the NRCS Plants Database (USDA 2009). **Table 3-10** summarizes the vegetation cover types and associated linear miles along the proposed route.

Table 3-10 Vegetation Cover Types within the Greencore Project Area

Vegetation Cover Type	Linear Miles	Percent of Project Route
Grassland/shrubland	225.9	97.8
Wetland/waterbodies	1.1	0.5
Previously Disturbed	1.4	0.6
Agriculture	1.9	0.8
Upland forest/woodland	0.8	0.3
Total	**231.1**	**100.0**

Grassland/shrubland

Approximately 226.9 miles (97.8 percent) of the proposed route would cross grassland/shrubland habitat. Grassland/shrubland habitats most commonly occupy valley bottoms, plains, foothills, plateaus, and benches. This vegetation cover type is dominated by big sagebrush (*Artemisia tridentata*), black sagebrush (*Artemisia nova*), and bud sagebrush (*Picrothamnus desertorum*), and codominated by antelope bitterbrush (*Purshia tridentata*) and rabbitbrush species (*Chrysothamnus* sp.). Common graminoid species include western wheatgrass (*Pascopyrum smithii*), needlegrass (*Achnatherum* sp.), needle-and-thread (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda*), threadleaf sedge (*Carex filifolia*), bluebunch wheatgrass (*Pseudoroegneria spicata*), little bluestem (*Schizachyrium scoparium*), and Indian ricegrass (*Achnatherum hymenoides*). Common forb species include buckwheat (*Erigonum* sp.), bluebells (*Mertensia* sp.), broom snakeweed (*Gutierrezia sarothrae*), and soapweed yucca (*Yucca glauca*). Perennial herbaceous components typically contribute less than 25 percent vegetative cover. This habitat provides forage for domestic livestock and wildlife and, within the project area, is the vegetation cover type most commonly used for livestock grazing.

Waters of the U.S., Wetlands, Riparian Areas

WUS are defined in 33 CFR Part 328.3 and include all non-tidal waters that currently are, or were used in the past, or may be susceptible to use in interstate commerce; all interstate waters including wetlands; all other waters such as interstate lakes, rivers, streams (including intermittent streams), mud flats, sand flats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate commerce; and all impoundments of waters otherwise defined as WUS under this definition. In addition, tributaries of the above listed waters, including arroyos and other intermittent drainages, and wetlands adjacent to the above waters also are considered to be WUS.

Criteria used by the USACE to determine whether a drainage constitutes a WUS include presence of a defined bed (i.e., a linear bed in a topographic depression which would transport surface water from a watershed); presence of defined banks (i.e., near vertical or steep-sided banks formed by erosion from flowing water); and evidence of an ordinary high water mark (i.e., indicator[s] that the drainage is subject to surface water flows on an average annual basis; such indicators include a scoured bed, shelving, an absence of terrestrial vegetation and recent alluvial or litter deposition).

As described above, wetlands adjacent to other WUS, such as streams, also are considered to be WUS. In addition, and as used in this section, the term “wetlands” has a regulatory definition as defined in 33 CFR 328.7(b). The term “wetland” is defined as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.” Note that the frequency and duration of saturation may vary by geographical region, and is largely dependent upon local climatic conditions.

Under the USACE’s 1987 Wetland Delineation Manual, a "three-parameter" approach is required for delineating USACE-defined wetlands (USACE 1987). Based on this approach, areas are identified as wetlands if they exhibit the following characteristics:

- The prevalence of vegetation consisting of hydrophytic species or plants that have the ability to grow in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content and depleted soil oxygen levels.
- The presence of soils that are classified as hydric or possessing characteristics that are associated with reducing soil conditions. Hydric soils are poorly drained and have a seasonal high water table within 6 inches of the surface.
- An area which is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation (usually 12.5 percent of the growing season) (USACE 1987; WTI 1995). Within the Project area, an area would need to be saturated for a period of approximately 15 days to support vegetation adapted to saturated soils based on the average number of days above 32 degrees Fahrenheit (i.e., 120 days*0.125) (NRCS 2006).

The USACE (1987) requires that, under normal circumstances, all three of these conditions be met for an area to be considered a wetland under the USACE’s definition. Federal mandates governing regulatory enforcement in wetlands and other WUS include Section 10 of the Rivers and Harbors Act of 1899 (Section 10), Sections 401 and 404 of the Clean Water Act, as amended (33 U.S.C. 1251 *et seq*.), and Executive Order 11990, Protection of Wetlands (42 Federal Register [FR] 26961). Final regulatory authority and delineation boundaries for wetlands and WUS within the Project area lie with the USACE.

Riparian areas are generally defined as the vegetated transitional zones that lie between aquatic and terrestrial (or upland) environments. Riparian areas usually occur as belts along streams, rivers, lakes, marshes, bogs, and other water bodies. As a transitional zone between aquatic and upland environments, riparian systems often exhibit characteristics of both; but are not as dry as upland environments or as wet as aquatic or wetland systems. Generally, only perennial and intermittent streams can support riparian areas that serve the entire suite of riparian ecological functions. Ephemeral streams rarely possess the hydrologic conditions that allow true riparian vegetation to grow.

The riparian vegetation cover type, occupying approximately 1.1 miles (0.5 percent) of the proposed route, is a habitat composed of a mosaic of palustrine emergent wetlands (PEM), perennial, intermittent, and ephemeral waterbodies, and open water (i.e., natural and manmade ponds). These systems are dependent on a natural hydrologic regime, especially annual or episodic flooding, occurring within floodplains, islands, sand or cobble bars, and immediate streambanks that support perennial (e.g., Salt Creek, Meadow Creek, Little Powder River, South Fork Powder River, and Ranch Creek) and intermittent waterbodies throughout the Project area. Dominant species include boxelder (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), quaking aspen (*Populus tremuloides*), eastern cottonwood (*Populus deltoides*), Fremont cottonwood (*Populus fremontii*), peachleaf willow (*Salix amygdaloides*), chokecherry (*Prunus virginiana*), skunkbush sumac (*Rhus trilobata*), Drummond’s willow (*Salix drummondiana*), narrowleaf willow (*Salix exigua*), silver buffaloberry (*Shepherdia argentea*), snowberry species (*Symphoricarpos* sp.), and sedge species (*Carex* sp.).

Prior to field survey commencement, a desktop review of the National Wetland Inventory (NWI) database in conjunction with aerial photographic interpretation was completed to identify the spatial extent of hydrological features within the Project area. On-the-ground wetland and waterbody delineations were conducted in 2009 and 2010 along the proposed pipeline route and access roads. The following features were identified within the Project area: 16 PEM complexes, 155 ephemeral waterbodies, 47 intermittent waterbodies, 18 perennial waterbodies, and 3 open water features. A detailed waterbody crossing table is presented in Section 3.4, Water Resources.

Previously Disturbed

Approximately 1.4 miles (0.6 percent) of the proposed route would cross previously disturbed land, which is typically characterized as ROWs including roads, railroads, and utility corridors. This cover type only includes ROWs that are crossed by the Project centerline; in other words, the 1.4 miles listed above does not include areas where the Greencore ROW is collocated with existing utility ROWs (210 miles, 91 percent of route is collocated). Therefore, the miles of previously disturbed land is misleading. In areas where the Project is collocated, the mileage of the reclaimed, adjacent ROW was included in the grassland/shrubland vegetation cover type instead of previously disturbed land.

Agriculture

Approximately 1.9 miles (0.8 percent) of the proposed route would cross agricultural lands. The agriculture vegetation type is characterized by both dryland (i.e., areas of grasses, legumes, or grass-legume mixtures) and pivot irrigated cropland (i.e., areas used for production of annual crops such as corn and soybeans).

Upland forest/woodland

Approximately 0.8 mile (0.3 percent) of the proposed route would traverse the upland forest/woodland vegetation type. This vegetation cover type, restricted to the Project area within Powder River County, Montana, is characterized by moderately sloping to very steep sideslopes on shallow, rocky soils. Dominant species include ponderosa pine (*Pinus ponderosa*) and understory species such as big sagebrush, rabbitbrush, western wheatgrass, squirreltail (*Elymus elymoides*), broom snakeweed, and Indian ricegrass. This vegetation type is used for livestock grazing and wildlife habitat.

3.5.1 Noxious Weeds

An increasing concern on both public and private lands is the introduction, spread, and proliferation of noxious weed and invasive plant species. Pursuant to the Montana Department of Agriculture and the Montana Annotated Code, a 'noxious weed' is defined as "any exotic plant species established or that may be introduced in the state that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses or that may harm native plant communities" (Montana Legislative Services 2009). Montana currently declares 32 plant species as state-designated noxious weeds based on the following categorical characterizations:

- Category 1 noxious weeds (15 species total) are weeds that are currently established and generally widespread in many counties of the state. Management criteria include awareness and education, containment and suppression of existing infestations and prevention of new infestations. These weeds are capable of rapid spread and render land unfit or greatly limit beneficial uses.
- Category 2 noxious weeds (10 species total) have recently been introduced into the state or are rapidly spreading from their current infestation sites. These weeds are capable of rapid spread and invasion of lands, rendering lands unfit for beneficial uses. Management criteria include awareness and education, monitoring and containment of known infestations and eradication where possible.
- Category 3 noxious weeds (6 species total) have not been detected in the state or may be found only in small, scattered, localized infestations. Management criteria include awareness and education, early detection and immediate action to eradicate infestations. These weeds are known pests in nearby states and are capable of rapid spread and render land unfit for beneficial uses.

- Category 4 noxious weeds (1 species total) are invasive plants and may cause significant economic or environmental impacts if allowed to become established in Montana. Management criteria include prohibition from sale by the nursery trade. Research and monitoring may result in the plant being listed in a different category (Montana Department of Agriculture 2010).

Pursuant to the Wyoming Weed and Pest Control Act of 1973, a total of 23 plant species are defined as designated and prohibited noxious weed species (Designated Noxious Weeds .S. 11-5-102 (a)(xi) and Prohibited Noxious Weeds W.S. 11-12-104) (Wyoming Department of Agriculture no date). In addition to the Wyoming state designated species, management is required for additional county-specific species for Natrona, Johnson, and Fremont counties, Wyoming and BLM noxious weed species for the Buffalo, Lander, and Casper FOs.

As required by the BLM as an integral component of the environmental impact evaluation, noxious weed surveys were conducted along the proposed pipeline route for all Montana and Wyoming state-designated species between September to November 2009 and April to July 2010. Noxious weed populations were identified and mapped within the 200-foot-wide pipeline ROW corridor for both the proposed route and potential reroutes. The Noxious Weed Management Plan POD (Appendix K) lists all aforementioned noxious weed species and further summarizes species distribution within the Project area based on known population records and field identified populations.

3.5.2 Agriculture and Range Resources

The proposed pipeline route is characterized as a patchwork of BLM, State of Wyoming, State of Montana, and private surface ownership parcels encompassing numerous private ranching operations and 64 BLM grazing allotments (i.e., BLM-managed federal parcels designated for authorized grazing privileges). Ranching activities in the Project area include cow-calf, yearling, and sheep grazing operations.

Table 3-11 summarizes each BLM grazing allotment within the Project area, including acreage calculations, current stocking rates, and permitted uses. Grazing capacities within the Project area vary based on vegetation types (range sites), landform, slope, and range condition. Grazing capacities range from 0.1 to 11.4 acres per animal unit month (AUM); areas with low carrying capacities occur in lower average annual precipitation zones (less than 9 inches annually) and, conversely, moderate carrying capacities would correlate to higher average annual precipitation rates (9 to 12 inches annually).

Table 3-12 summarizes range improvements within the Project area. Improvements consist of water retention and diversion structures (reservoirs/dams, ditches, pipelines, etc.), well and spring developments, fencing, livestock containment structures, and roads. The 18 perennial waterbodies crossed by the Project are the source for the water-based improvements (**Table 3-8**).

3.5.3 Threatened, Endangered, Candidate, and Sensitive Plant Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Seventeen special status plant species including federally listed, federally proposed, and federal candidate; and BLM and state sensitive species were identified as potentially occurring within the Project area (BLM 2010f; USFWS 2010; WYNDD 2010). The potential occurrence of special status plant species within the Project area was based on range, known distribution, and the presence of suitable habitat crossed by the Project (**Appendix E**). Of the 17 species, a total of 12 species were eliminated from detailed analysis based on rationale presented in **Appendix E**. The remaining five species, which have the potential to occur within the Project area, as detailed in **Appendix E** include the following species: Porter's sagebrush, blowout penstemon, persistent sepal yellowcress, limber pine, and Ute's ladies'-tresses orchid.

Table 3-11 Grazing Allotments within the Greencore Project Area

Grazing Allotment Name	Total Allotment Acreage	Total Allotment Active AUMs[1]	Allotment Acreage within the Project Area	Projected Active AUMs within the Project Area[2]	Livestock		Grazing Period		Type of Use
					Type	Stocking Rate	Begin	End	
33 Mile SDW	38,755.8	0	60.0	0.0	C	9	1-Nov	26-Dec	M
Beck Place	29,767.6	1,550	86.8	4.5	C,H	259	1-Mar	28-Feb	I
Brown Kennedy Ranch	32,541.0	501	64.6	1.0	C	42	1-Mar	28-Feb	A
Burke	69,421.5	3,693	46.3	2.5	C,H	2,176	1-Mar	28-Feb	I
Camel's Hump	10,948.6	447	52.6	2.1	C,H	59	1-Mar	28-Feb	I
Carpenter Draw	2,157.3	81	0.0	0.0	C	7	2-Mar	28-Feb	A
Castle Creek	19,833.8	1,026	27.5	1.4	C,S,H	350	1-Mar	28-Feb	M
Crenshaw Hill	5,853.8	87	20.2	0.3	C	72	1-Mar	28-Feb	C
Crooked Creek	26,578.1	2,694	63.8	6.5	C	345	1-Mar	28-Feb	A
Daly Livestock Co	55,446.8	1,107	124.9	2.5	C	615	1-Mar	28-Feb	A
Dead Horse Creek Oilfield	6,390.1	216	76.4	2.6	C	18	1-Mar	28-Feb	A
Deadhorse II	10,543.2	286	29.5	0.8	C,H	73	1-Mar	28-Feb	M
Dry Trail Creek	4,855.4	389	38.8	3.1	C	32	1-Mar	28-Feb	C
Dugout Creek	13,647.5	2,434	63.9	11.4	C	221	1-Mar	28-Feb	A
East Spring Draw	25,192.8	550	54.3	1.2	C	46	1-Mar	28-Feb	A
Eccles	13,815.0	1,286	55.9	5.2	C,H	281	1-Apr	28-Feb	I
Eighty-Five Divide	12,827.1	384	27.9	0.8	C	32	1-Mar	28-Feb	A
Falxa	40,007.6	1,546	46.7	1.8	C	560	1-Mar	28-Feb	A
Flying U Ranch	22,739.9	819	103.7	3.7	C	511	15-May	16-Aug	A
Government Draw	4,098.6	380	17.5	1.6	C	63	1-Mar	28-Feb	A

Table 3-11 Grazing Allotments within the Greencore Project Area

Grazing Allotment Name	Total Allotment Acreage	Total Allotment Active AUMs[1]	Allotment Acreage within the Project Area	Projected Active AUMs within the Project Area[2]	Livestock		Grazing Period		Type of Use
					Type	Stocking Rate	Begin	End	
Gowin	14,662.8	260	22.3	0.4	C	22	1-Mar	28-Feb	C
Hines	3,641.4	24	34.3	0.2	C	2	1-Mar	28-Feb	A
Hoe Ranch	35,254.3	1,676	102.6	4.9	S	1486	1-Mar	28-Feb	A
Horse Creek/Pipeline	1,281.4	8	15.9	0.1	C	80	1-Jun	30-Nov	C
Kingsbury/Wild Horse	7,204.1	33	33.2	0.2	C	100	1-Mar	28-Feb	
Kingsbury/Wild Horse	NA	NA	NA	NA	H	37	1-Mar	28-Feb	A
Little Willow	24,060.8	823	80.9	2.8	C	69	1-Mar	24-Feb	C
Little Willow	NA	NA	NA	NA	S	30	15-Apr	15-Feb	A
Madden Ranch Past	5,529.2	170	2.6	0.1	NA	NA	NA	NA	NA
Meadow Creek	10,074.5	248	71.4	1.8	C	172	1-Mar	28-Feb	A
Miller	10,150.8	312	17.7	0.5	C,H	26	1-Mar	28-Feb	C
Mumma Draw	9,229.3	54	28.0	0.2	C	4	1-Mar	28-Feb	C
North Mitten	2,542.5	21	2.6		NA	NA	NA	NA	NA
North Of Tracks	17,788.9	2,205	52.4	6.5	NA	NA	NA	NA	NA
Okie Trail	45,862.8	3,064	84.2	5.6	C	554	1-Mar	28-Feb	M
Paul Place	3,305.9	202	32.1	2.0	C,H	29	1-Mar	28-Feb	C
Pine Mountain	13,861.8	641	38.1	1.8	C	206	1-Mar	28-Feb	C
Pine Ridge	3,552.8	27	21.1	0.2	C	59	1-Aug	31-Dec	A
Potter	17,773.2	2,448	25.8	3.6	C	271	1-Mar	28-Feb	I
Powder River Draw	6,366.6	229	40.9	1.5	C	57	1-Mar	28-Feb	M
Pumpkin Creek	28,999.5	1,454	74.9	3.8	C	263	1-Mar	28-Feb	A
Railroad	19,863.9	1,477	103.3	7.7	C	206	1-Mar	28-Feb	I

Table 3-11 Grazing Allotments within the Greencore Project Area

Grazing Allotment Name	Total Allotment Acreage	Total Allotment Active AUMs[1]	Allotment Acreage within the Project Area	Projected Active AUMs within the Project Area[2]	Livestock		Grazing Period		Type of Use
					Type	Stocking Rate	Begin	End	
Ryan	3,738.8	46	12.1	0.1	C	4	1-Mar	28-Feb	C
SF Holler Draw	4,107.2	26	34.9	0.2	C	16	1-Mar	28-Feb	C
Shamrock	5,876.1	569	40.0	3.9	C,S	92	1-Mar	28-Feb	I
Skidmore Estate	4,571.0	9	10.2	0.0	S	50	1-Jun	1-Sep	A
Smoky Gap-H. Jarra	6,524.9	262	20.0	0.8	C,H	53	16-Jun	28-Feb	M
South Carpenter Draw	2,612.7	11	53.7	0.2	C	50	1-Mar	28-Feb	A
South Cave Gulch	14,810.5	395	69.2	1.8	C,H	650	1-Mar	28-Feb	M
South Fork Casper	3,867.0	236	8.7	0.5	C	21	1-Mar	28-Feb	C
Springsteen	1,319.6	679	0.9	0.4	C	172	1-Mar	28-Feb	M
St. Clair South Pa	4,955.5	814	9.1	1.5	NA	NA	NA	NA	NA
Sullivan	19,863.9	2,299	52.6	6.1	C,S	1,965	1-Mar	7-Sep	I
Summer Brewer	8,745.1	374	24.3	1.0	C	108	1-Mar	28-Feb	C
Swartz, Edward H.	15,045.3	496	32.1	1.1	C	370	1-Mar	28-Feb	A
Throne John and Earl	6,642.9	24	0.0	0.0	C	66	1-Mar	28-Feb	A
Trail Creek	30,178.8	2,629	32.0	2.8	C	249	1-Mar	28-Feb	A
Ttt-Scotts Place	8,888.1	589	47.3	3.1	C,G,H	139	1-Jul	28-Feb	M
Tuttle Draw	1,598.6	92	9.4	0.5	C	100	1-Mar	28-Feb	A
Tuttle Draw/Deep Creek	8,618.2	154	15.4	0.3	C	182	1-Mar	28-Feb	A
Waltman	6,363.9	205	7.9	0.3	C,H	93	16-May	31-Oct	C
Weidt	3,336.5	221	23.2	1.5	C	49	1-Jul	28-Feb	M

Table 3-11 Grazing Allotments within the Greencore Project Area

Grazing Allotment Name	Total Allotment Acreage	Total Allotment Active AUMs[1]	Allotment Acreage within the Project Area	Projected Active AUMs within the Project Area[2]	Livestock		Grazing Period		Type of Use
					Type	Stocking Rate	Begin	End	
Wormwood Ranch	85,691.2	2,491	172.1	5.0	S	1000	1-Mar	28-Feb	A
Wormwood Ranch	NA	NA	NA	NA	C	361	1-Mar	28-Feb	A
Wyatt Draw	814.6	11	20.2	0.3	S	14	1-Mar	28-Feb	C
Total	**6,201,922.4**	**47,463**	**2,831.4**	**128.2**	**NA**	**NA**	**NA**	**NA**	**NA**

[1] An AUM represents the quantity of forage necessary to sustain 1 cow-calf pair or 5 sheep for 1 month.

[2] Projected active AUMs were calculated based on the percentage of the allotment within the Project area compared to the allotment as a whole.

"A" denotes active use, "C" denotes custodial use, "M" denotes maintain or healthy rangeland status, "I" denotes need for improvement.

NA = Information not available for analysis.

Table 3-12 Range Improvements within the Greencore Project Area

Grazing Allotment Name/Range Improvement per Allotment	Legal Location				
	Meridian	Township	Range	Section	Subdivision
Crooked Creek					
Johnny #2 (reservoir)	6th Principal	14	4	25	NENW
Indian Draw Fence	6th Principal	43	80	35	W2E2
Johnny #1 (reservoir)	6th Principal	14	5	30	NESE
Johnson Ditch	6th Principal	14	4	17	SESE
Moreau Division Fence	6th Principal	14	4	25	NENE
Dugout Pasture Fence	6th Principal	41	79	32	--
Well Dugout Pasture	6th Principal	42	79	18	SE
Dugout Well	6th Principal	42	80	25	--
Macy Fence	6th Principal	14	4	21	NW4SE4
Crooked Creek Stock Facility	6th Principal	41	79	5	NESE
Daly Livestock Co.					
Twentymile Pipeline	6th Principal	51	74	4	NWNW
Timber Creek Pipeline	6th Principal	52	74	21	NENE
Dugout Creek					
Freiberg Pit (reservoir)	6th Principal	6	16	17	SENW
Freiberg Fence	6th Principal	6	16	8	NWNW
Freiberg Reservoir	6th Principal	6	16	17	SENW
Dugout Pipeline	6th Principal	40	79	6	NWSW
East Spring Draw					
Mieko Fence	6th Principal	42	86	2	NENE
Cole Draw Well	6th Principal	43	78	30	NWNE
Meike Emergency Pipeline	6th Principal	42	79	14	NENE
Falxa					
Falxa Pipeline Extension	6th Principal	47	78	32	SWSE
Falxa Divide Fence	6th Principal	47	78	27	SESE
Falxa Pipeline Extension	6th Principal	46	78	11	--
Flying U Ranch					
Short Creek Spring Development	6th Principal	54	71	28	--
Hoe Ranch					
Jepson Draw Stockwater Well	6th Principal	45	77	18	SWNW

Table 3-12 Range Improvements within the Greencore Project Area

Grazing Allotment Name/Range Improvement per Allotment	Legal Location				
	Meridian	Township	Range	Section	Subdivision
Horse Creek/Pipeline					
Gray Sky Fence	6th Principal	11	3	25	NENE
Magnuson Stockwater Pipeline	6th Principal	55	71	28	NESE
Little Willow Allotment					
Skyline Fence	6th Principal	13	4	24	SENW
Cook Burke Fence 1	6th Principal	14	4	33	SWSE
Sect 13 SC Dam	6th Principal	14	4	13	NWSE
Sect 13 NW Dam	6th Principal	14	4	13	SENW
SEC 13&24 Division Fence	6th Principal	13	4	13	NESE
Pumpkin Creek					
Upper Culp East Fence	6th Principal	47	77	10	--
Pumpkin Hill Well	6th Principal	46	77	9	NENE
Culp Divide Fence	6th Principal	47	77	11	--
PR Fed 12-9 Road	6th Principal	47	77	8	E2
Big Mike Flats Fence	6th Principal	48	77	18	W2NE4
Swartz, Edward H.					
Spring Draw Pipeline	6th Principal	54	72	30	SWSE
Lower Batz Drive Fence	6th Principal	54	72	33	SENW
Batz Draw Fence	6th Principal	54	72	29	NWSW
Swartz Fence 1	6th Principal	53	72	9	NWSE
Batz Draw Pipeline	6th Principal	54	72	33	NESW
Trail Creek					
Rockypoint Reservoir	6th Principal	56	69	4	NESE
Tuttle Draw/Deep Creek					
Beecham Draw Reservoir	6th Principal	11	2	20	NWSW
South Slope Pit (reservoir)	6th Principal	11	2	28	NWSE
Cut Blade Reservoir	6th Principal	11	2	20	SWNW
P. Davis Fence	6th Principal	11	2	21	NESW
South Slope Pit Snowfence	6th Principal	11	2	28	NW4NE4
Sutton Reservoir	6th Principal	11	2	15	SWSW
Crook Road Pit (reservoir)	6th Principal	11	2	28	SWNE
Arrowhead Reservoir	6th Principal	11	2	28	NWNE
P J Reservoir	6th Principal	11	2	28	NWSE

Table 3-12 Range Improvements within the Greencore Project Area

Grazing Allotment Name/Range Improvement per Allotment	Legal Location				
	Meridian	Township	Range	Section	Subdivision
P J Fence	6th Principal	11	2	28	NWNE
Wormwood Ranch					
Flora Fence	6th Principal	47	76	5	--
Burger Fence	6th Principal	48	77	22	--
Wormwood Pipeline	6th Principal	46	77	1	--

Source: AECOM 2010d.

Suitable habitat for each species was determined through the implementation of a species-specific habitat suitability model based on soil, geology, and vegetation association parameters and known distribution records. **Table 3-13** summarizes each species analyzed in detail and indicates where within the Project area the species may occur based on the implementation of the suitability model, aerial photographic interpretation, on-site field verification, and species-specific surveys. After further analysis, it was determined through the use of the suitability model that potential habitat does not occur within the Project area for limber pine. Suitable habitat for the Porter's sagebrush and blowout penstemon was further defined based on species-specific surveys as conducted on June 15 through 19, 2010. Suitable habitat for persistent sepal yellowcress was further defined based on species-specific surveys conducted on July 23 through 30, 2010. Suitable habitat for the Ute's ladies'-tresses orchid was further defined based on species-specific surveys conducted on August 2, 2010, and August 16 through 18, 2010.

Table 3-13 Special Status Plant Species Potentially Occurring within the Greencore Project Area

Common Name	Scientific Name	Status[1]	Potentially Suitable Habitat Areas (MP) (20100714 CL)[2]
Porter's sagebrush	*Artemisia porteri*	BLM	MP 2.0-5.4; 5.9-6.8; 10.5-21.7; 23.3-25.5 (P); 28.4-33.3 (P); 61.0-61.1; 72.0-75.9 (P); 80.3-80.7 (P); 81.9-82.4 (P); 82.7-83.1 (P)
Limber pine	*Pinus flexilis*	BLM	No potential habitat locations were identified based on the species-specific habitat suitability model.
Blowout penstemon	*Penstemon haydenii*	FE	MP 47.4-50.4 (P); AR 2D (P)
Persistent sepal yellowcress	*Rorippa calycina*	BLM	MP 95.4
Ute's ladies'-tresses orchid	*Spiranthes diluvialis*	FT	MP 148.5; 199.3

[1] BLM = BLM Sensitive Species; FE = Federally Listed as Endangered; FT = Federally Listed as Threatened.

[2] P = Partially suitable habitat and partially unsuitable habitat noted within the indicated MP range.

3.6 Wildlife Resources

3.6.1 Recreationally and Economically Important Species and Nongame Wildlife

As discussed in Section 3.5, Vegetation, Wetlands, Agriculture, and Range Resources, the Project route would cross five habitat types including grassland/shrubland, upland forest/woodland, agriculture, wetland/

waterbodies, and developed lands. The Project area is characterized by flat to low rolling terrain with intermittent terraces, steep slopes, and rocky ridges. Baseline descriptions of both resident and migratory wildlife include species that have either been documented along the Project route or those that may occur in the Project region based on habitat associations. Wildlife species that may occur along the majority of the Project route are typical of the grassland/shrubland communities of central/northeast Wyoming and southeast Montana. Species that inhabit wetland/waterbody habitat are limited to the Powder River, perennial and intermittent drainages, and ponds and marshes that are either crossed by the Project or occur in the surrounding uplands.

3.6.1.1 Big Game Species

Big game species that occur in the Project region include pronghorn, mule deer, and elk (BLM 2007a, 2001a, 2000b, 1987; WGFD 2004). Seasonal ranges considered to be crucial for these species during the winter months (generally November 15 to April 30) include habitats that provide adequate forage and thermal cover for over-winter survival and reproduction requirements, particularly during extreme winters.

Pronghorn occur throughout the majority of the region crossed by the Project. Pronghorn inhabit grasslands and semi-desert shrublands on flat to rolling topography and browse on shrubby plants, especially sagebrush, throughout the year. During the winter, pronghorn generally utilize areas of relatively high sagebrush densities and overall low snow accumulations, on south- and east-facing slopes. Crucial winter/yearlong range for this species occurs along 20.1 miles of the Project ROW (**Table 3-14**).

Table 3-14 Big Game Ranges Crossed by the Greencore Project

Species	Habitat Type[1]	Mileposts	Miles Crossed
Pronghorn	Crucial Winter/Yearlong	1.0 – 3.3	2.3
		3.5 – 3.7	0.2
		5.0 – 6.4	1.4
		10.3 – 10.9	0.6
		18.2 – 19.3	1.1
		39.7 – 54.2	14.5

[1] Source: WGFD 2010b.

Mule deer also occur throughout the majority of the region associated with the Project, inhabiting virtually all vegetation types. Mule deer feed on a wide variety of plants including forbs, grasses, sedges, shrubs, and trees. Like pronghorn, winter habitat for mule deer occurs in areas of relatively high sagebrush densities and overall low snow accumulation, on south- and east-facing slopes. The Project route does not cross mule deer crucial winter range.

Elk occur in a variety of habitats in the Project region including coniferous forests, aspen, shrublands, grasslands, and agricultural areas. However, they tend to occur in low densities on large tracts of private land along the majority of the Project route. The Greencore route does not cross elk crucial winter range or parturition range.

3.6.1.2 Small Game Species

Small game species that occur within the Project area include upland game birds, small mammals, furbearers, and waterfowl. Upland game birds that occur within the Project area include greater sage-grouse, sharp-tailed grouse, gray (Hungarian) partridge, and mourning dove. The greater sage-grouse is a BLM sensitive species and discussed further under Section 3.6.2, Threatened, Endangered, Candidate, and Sensitive Wildlife Species. Sharp-tailed grouse occur in a wide variety of habitats including grasslands, agricultural areas, and

shrublands. Sharp-tailed grouse populations are known to occur along the Project route in portions of northeastern Wyoming and southeast Montana. Gray (Hungarian) partridge are associated with grasslands, shrublands, and agricultural areas and are considered widespread but not common in the northern portions of the Project region (Stokes and Stokes 1996; WGFD 2004). Mourning dove occur in habitats ranging from deciduous forests to shrubland and grassland communities, often nesting in trees or shrubs near riparian areas or water sources. Small game mammals likely to occur within the Project area include desert cottontail and white-tailed jackrabbit.

Furbearers likely to occur along the Project route include beaver, raccoon, striped skunk, muskrat, mink, long-tailed weasel, short-tailed weasel, badger, bobcat, coyote, and red fox (BLM 2007a,b; MFWP 2010c; WGFD 2004). These species have a wide distribution in Wyoming and Montana and are found within a variety of habitat types including grasslands, riparian woodlands, coniferous forests, and sagebrush shrublands.

Numerous species of waterfowl nest and migrate through the region, especially in the vicinity of the Powder River. Common waterfowl species along the Project route include Canada goose, mallard, green-winged teal, northern pintail, gadwall, and American widgeon. Other common summer residents include blue-winged teal, cinnamon teal, northern shoveler, redhead, and ring-necked duck (BLM 2007a; Stokes and Stokes 1996; WGFD 2004).

3.6.1.3 Nongame Species

A diversity of nongame species (e.g., small mammals, raptors, passerines, amphibians, and reptiles) occupies a variety of trophic levels and habitat types along the Project route. Common nongame wildlife species include small mammals such as bats, voles, squirrels, gophers, prairie dogs, woodrats, and mice. These small mammals provide a substantial prey base for predators in the Project region including larger mammals (coyote, badger, bobcat), raptors (eagles, buteos, accipiters, owls), and reptiles (snakes). The white-tailed prairie dog and black-tailed prairie dog are BLM sensitive species and are discussed further in Section 3.6.2, Threatened, Endangered, Candidate, and Sensitive Wildlife Species. A number of bat species also occur within the Project region including long-legged myotis, little brown myotis, big brown bat, and western small-footed myotis. BLM sensitive bat species are discussed further in Section 3.6.2, Threatened, Endangered, Candidate, and Sensitive Wildlife Species.

Raptors and Other Migratory Birds

Nongame birds encompass a variety of passerine and raptor species including migratory bird species that are protected under the Migratory Bird Treaty Act (16 U.S.C. 703-711) and Executive Order (EO) 13186 (66 FR 3853). Pursuant to EO 13186, a Memorandum of Understanding (MOU) between the BLM and USFWS outlines a collaborative approach to promote the conservation of migratory bird populations. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. This MOU identifies specific activities where cooperation between the BLM and USFWS would contribute to the conservation of migratory birds and their habitat.

Raptor species that could potentially occur as residents or migrants within the Project region include eagles (bald and golden eagles), buteos (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk), falcons (e.g., prairie falcon, American kestrel), accipiters (e.g., Cooper's hawk, sharp-shinned hawk), owls (e.g., great-horned owl, burrowing owl, long-eared owl, short-eared owl), northern harrier, and turkey vulture (BLM 2007a; Stokes and Stokes 1996; WGFD 2004). Breeding raptor surveys were conducted along the proposed ROW, known access roads, and ATWS using aerial inventory procedures. The aerial raptor surveys were conducted on May 27 and 28, 2010, to identify occupied territories or active nest sites located within 1.0 mile from the outside edge of the ROW boundary. Aerial surveys focused on cliff nesters (e.g., golden eagle, falcon species) and species that commonly build nests in deciduous trees or on promontory points (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk, great-horned owl). The aerial surveys did not concentrate on cavity nesters (e.g., American kestrel), ground nesters (e.g., northern harrier), sub-terranean nesters (e.g., burrowing owl), or most conifer nesters (e.g., accipiters), based on visibility limitations from the helicopter. These species would be surveyed for during additional ground surveys that would be conducted in spring 2011

if construction occurs during the raptor breeding season (generally February 1 to July 31). In addition, ground surveys would be conducted at nest sites where either breeding status could not be determined or in areas that were identified as potentially supporting nesting birds during the 2010 aerial surveys.

Based on the results of the 2010 breeding raptor surveys and other biological surveys, 215 nest sites (43 new and 172 historic) were identified within 1.0 mile of the Project ROW. Of these 215 nest sites, 33 were active, and 182 were inactive (AECOM 2010a). The active nest sites were occupied by bald eagles (3); golden eagles (2); red-tailed hawks (17); Swainson's hawk (1); ferruginous hawks (2); prairie falcons (2); great horned owls (3); and American kestrel and unknown (2).

A variety of passerines occur within the Project region throughout the year; however, they are most abundant during the spring/fall migration as well as during the breeding season (May 15 to June 30 [Nicholoff 2003]). Representative bird species that occur in the Project region include Say's phoebe, horned lark, barn swallow, black-billed magpie, American raven, western meadowlark, and lark bunting (BLM 2007a; Stokes and Stokes 1996; WGFD 2004).

Reptiles

Reptiles occupying the Project region are typically limited by their specific habitat requirements. Species that could potentially occur within the Project area include the eastern short-horned lizard, northern sagebrush lizard, and prairie rattlesnake (Baxter and Stone 1980; BLM 2007a,b; WGFD 2004).

3.6.2 Threatened, Endangered, Candidate, and Sensitive Wildlife Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Twenty-six special status wildlife species including federally listed, federally proposed, and federal candidate; and BLM sensitive species were identified as potentially occurring within the Project area (BLM 2010f, 2007a; USFWS 2010; WGFD 2010a; WYNDD 2010). The potential occurrence of special status species within the Project area was based on range, known distribution, and the presence of potentially suitable habitat crossed by the Project route (**Appendix E**). A total of seven wildlife species were eliminated from detailed analysis (Preble's meadow jumping mouse, pygmy rabbit, northern goshawk, peregrine falcon, Baird's sparrow, white-faced ibis, trumpeter swan) based on rationale presented in **Appendix E**. The remaining 19 wildlife species that have the potential to occur along the Project route are discussed below.

3.6.2.1 Mammals

Black-footed Ferret

The black-footed ferret (*Mustela nigripes*) is classified as a federally endangered species. The historic range of this species included the Rocky Mountain and western Great Plains regions of North America (Fitzgerald et al. 1994). This species utilizes semi-arid grasslands and mountain basins associated with prairie dog colonies. The only known populations of black-footed ferrets are either captive or have been reintroduced, with no natural wild populations known to occur. In Wyoming, the known distribution of this species is limited to a non-essential experimental population area within the Shirley Basin approximately 35 miles southeast of Casper (WGFD 2005). While suitable habitat (i.e., white-tailed and black-tailed prairie dog colonies) does occur along the Project route, the USFWS has "block-cleared" all prairie dog colonies along the Project route in Wyoming (USFWS 2004). No prairie dog colonies are crossed by the Project ROW in Montana (AECOM 2010c).

White-tailed Prairie Dog

The white-tailed prairie dog (*Cynomys leucurus)* is classified as a BLM sensitive species. White-tailed prairie dogs inhabit xeric sites with mixed shrubs and grasses. This species is often associated with sagebrush and saltbrush and tends to occupy higher elevations than the black-tailed prairie dog (MFWP 2010a; WGFD 2005). In Wyoming, the white-tailed prairie dog is found in the western two-thirds of the state, excluding the areas

near Yellowstone and Grand Teton National Parks (WGFD 2005). In Montana, this species is limited to the extreme south-central portion of the state (MFWP 2010a).

Aerial and ground white-tailed prairie dog surveys were conducted from September 20 and 22, 2009, April 13 to 17, 2010, and May 5 to June 4, 2010, respectively, to determine location, size, and density of active colonies. Six active white-tailed prairie dog colonies, encompassing 189.6 acres, were located within 0.25 mile of the Project ROW (AECOM 2010c). Based on the results of these surveys the potential for this species to occur along the Project route is considered high.

Black-tailed Prairie Dog

The black-tailed prairie dog (*Cynomys ludovicianus*) is classified as a BLM sensitive species. Black-tailed prairie dogs inhabit shortgrass prairie and mixed grasslands that contain suitable upland soil types for constructing extensive burrow systems. In Wyoming, the historical range of this species included much of eastern Wyoming and the Bighorn Basin (WGFD 2005). The current distribution of this species is similar to the historic range and includes mountain-foothills and shrublands along the southern end of the Bighorn Mountains as a habitat link between the eastern grasslands and the Bighorn Basin. In Montana, this species is found throughout the eastern portion of the state in suitable sparse grassland and shrubland habitats (MFWP 2010b).

Aerial and ground black-tailed prairie dog surveys were conducted from September 20 and 22, 2009, April 13 to 17, 2010, and May 5 to June 4, 2010, respectively, to determine location, size, and density of active colonies. Twenty-two active black-tailed prairie dog colonies, encompassing 389.8 acres, were located within 0.25 mile of the Project ROW (AECOM 2010c). Based on the results of these surveys the potential for this species to occur along the Project route is considered high.

Swift Fox

The swift fox (*Vulpes velox*) is classified as a BLM sensitive species. The swift fox was once distributed throughout the prairie regions from southern Canada, south through the Great Plains of the U.S. (WGFD 2005). Currently, this species exists in several highly disjunct populations in small portions of its historic range. Swift fox habitat is composed of level to gently sloping topography containing an open view of the surrounding landscape, abundant prey, and lack of predators and competitors (MFWP 2010d; WGFD 2005). In Wyoming, this species occurs in the eastern half of the state and inhabits short- and mid-grass prairies, often using highways and railroad ROWs for denning, and cultivated fields, old corrals, and buildings for foraging (WGFD 2005). In Montana, this species occurs throughout the eastern portion of the state, although the highest densities have been documented near the Canadian border (MFWP 2010d). This species was observed near MP 15.4 during fall 2009 field surveys (HWA 2009). Due to the presence of suitable habitat along the entire Project route, the potential for this species to occur along the Project route is considered high.

Sensitive Bat Species

The Townsend's big-eared bat (*Corynorhinus townsendii*), spotted bat (*Euderma maculatum*), long-eared myotis (*Myotis evotis*), and fringed myotis (*Myotis thysanodes*) are classified as BLM sensitive species. These species occur in a wide variety of habitats including semi-desert scrub, sagebrush shrubland, grassland, coniferous forest, and riparian areas. Roost sites consist of buildings, caves, mines, rock crevices, trees, and cliffs (Fitzgerald et al. 1994; WGFD 2005). However, no roost sites have been identified along the proposed project area. Based on the presence of suitable habitats, the potential for these species to occur along the Project route is considered high.

3.6.2.2 Birds

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is classified as a BLM sensitive species. Most nesting bald eagles in Wyoming occur in the greater Yellowstone area, including Teton County, Grand Teton National Park, and Yellowstone National Park (WGFD 2005). Several historic nest sites have been documented within or adjacent to the project ROW along the Powder River. The aerial surveys conducted for breeding raptors

(May 27 and 28, 2010) examined potential bald eagle suitable nesting habitat (e.g., Powder River) up to 1 mile on either side of the ROW. A total of three active bald eagle nest sites were found during the May 2010 raptor surveys (AECOM 2010a). In addition, one winter concentration area has been recorded within or adjacent to the Project ROW along the Powder River (AECOM 2010b). Based on the results of the biological surveys, the potential for this species to occur along the Project route is considered high.

Ferruginous Hawk

The ferruginous hawk (*Buteo regalis*) is classified as a BLM sensitive species. The ferruginous hawk breeds from the Canadian Prairie Provinces south to Oregon, Nevada, Arizona, and Oklahoma. It winters from the central and southern portions of its breeding range south into Baja California and central Mexico. This species inhabits semiarid open country, primarily grasslands, basin-prairie shrublands, and badlands. It requires large tracts of relatively undisturbed rangeland and nests on rock outcrops, the ground, knolls, cliff ledges, or trees (Johnsgard 1990; WGFD 2005). In Wyoming, this species is found throughout the state, although it is most common in the south-central portion of the state (WGFD 2005). In Montana, this species is found throughout the state but is most common in semiarid open shrubland and grassland habitats (MFWP 2010e). A total of two active ferruginous hawk nests were found during the May 2010 raptor surveys (AECOM 2010a). One of the active nests was located on a rock formation and the other active nest was on a BLM-constructed Artificial Nesting Structure (ANS). Based on the results of the May 2010 raptor nest survey, the potential for this species to occur along the Project route is considered high.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is classified as a BLM sensitive species. This species breeds from south-central British Columbia, south through most of the western U.S. and Mexico (WGFD 2005). The burrowing owl typically inhabits level, open areas in heavily grazed or low-stature desert vegetation, with available burrows for nesting and cover (Johnsgard 1988; WGFD 2005). Nesting habitat consists of abandoned mammal burrows on flat, dry, and relatively open terrain (Johnsgard 1988). Several historic nest sites occur in prairie dog colonies along the Project route; however, no active nest sites were located during field surveys conducted in 2010 (AECOM 2010c). Based on the habitats that would be crossed by the Project ROW, additional burrowing owl nest sites may occur in the vicinity of the Project ROW. The potential for this species to occur along the Project route is considered high.

Greater Sage-grouse

The greater sage-grouse (*Centrocercus urophasianus*) is classified as a federal candidate species as well as a BLM sensitive species. On March 5, 2010, the USFWS determined that the greater sage-grouse warrants protection under the ESA; however, the USFWS concluded that proposing the species for protection is precluded by the need to take action on other species facing more immediate and severe extinction threats. Therefore, greater sage-grouse in Wyoming and Montana continue to be managed by the WGFD and MFWP, respectively. Conservation efforts for this species in Wyoming and Montana currently are coordinated by the WGFD and MFWP in cooperation with the USFWS, BLM, and regional greater sage-grouse working groups in an attempt to increase population levels and avoid federal listing under the ESA. In an effort to prevent federal listing of greater sage-grouse, the WGFD has recently completed a revised map of greater sage-grouse core population areas in Wyoming. Greater sage-grouse core population areas include areas with the highest densities of breeding greater sage-grouse in the state, as well as areas important for connectivity between populations. The core population areas include roughly 25 percent of the state but contain 83.1 percent of the greater sage-grouse population in the state.

Lekking/Nesting Habitat

The center of breeding activity for greater sage-grouse is referred to as a strutting ground or lek. Leks are characterized as flat, sparsely vegetated areas within large tracts of sagebrush (Connelly et al. 2004). Males begin to appear on leks in March with peak attendance of Wyoming and Montana leks occurring in April (MFWP 2010f; WGFD 2005). Greater sage-grouse nesting habitat typically is centered on active leks and consists of medium to tall sagebrush with a perennial grass understory (Connelly et al. 2000). Studies have

shown that taller sagebrush with larger canopies and more residual understory cover usually lead to higher nesting success (Connelly et al. 2004, 2000).

A total of 69 lek sites have been identified within 4 miles of the Project ROW. All 69 leks are determined to be "occupied" by the WGFD. In addition, nesting habitat surveys were conducted from April 13 to 17, 2010, and May 5 to June 4, 2010, to determine location, size, and species composition of suitable nesting habitat. Based on these results, 38,231 acres of suitable nesting habitat in core population areas and 97,945 acres of suitable nesting habitat in non-core population areas was mapped within 0.5 mile of the Project ROW during field surveys in 2010 (AECOM 2010c). An additional 1,898 acres of suitable nesting habitat in core population areas and 17,269 acres of suitable nesting habitat in non-core population areas was mapped within 0.5 mile of access roads using a desktop analysis, aerial photo interpretation, and ground truthing (AECOM 2010c).

Brooding Habitat

During the late spring and summer, hens and broods typically are found in more lush habitats consisting of a high diversity of grasses and forbs that attract insects. These habitats include wet meadows, riparian areas, and irrigated farmland within or near sagebrush. Hens with broods would utilize these habitats until forbs desiccate and insect abundance decreases. Unsuccessful hens and cocks also would utilize these same habitats; however, due to their nutritional flexibility, they are able to occupy a wider variety of habitats during the spring and summer months (Connelly et al. 2004). In many greater sage-grouse populations, high quality brooding habitat is often the limiting factor due to drought, invasive weeds, and overgrazing associated with improper range management.

Wintering Habitat

Depending on the severity of the winter, greater sage-grouse would move to south- and east-facing slopes that maintain exposed sagebrush. Studies have shown that south-facing slopes with sagebrush at least 10 to 12 inches above the snow level are required for both food and cover. Windswept ridges, draws, and swales also may be used, especially if these areas are in close proximity to exposed sagebrush (Connelly et al. 2004). In years with severe winter conditions (i.e., deep snow), greater sage-grouse would often gather in large flocks in areas with the highest quality winter habitat. It is suggested that high quality winter habitat is limited in portions of the greater sage-grouse's range (Connelly et al. 2000).

Greater sage-grouse winter concentration area surveys were conducted on January 28 and 29, 2010, along the entire Project route. This survey documented one area with greater sage-grouse present (AECOM 2010b). Two additional winter concentration area surveys are scheduled to take place in December 2010 or January 2011, depending on snow conditions.

Based on the presence of occupied leks and suitable nesting, brooding, and wintering habitat, the potential for this species to occur along the Project route is considered high.

Brewer's Sparrow, Loggerhead Shrike, Sage Sparrow, Sage Thrasher

The Brewer's sparrow (*Spizella breweri*), loggerhead shrike (*Lanius ludovicianus*), sage sparrow (*Amphispiza belli*), and sage thrasher (*Oreoscoptes montanus*) are classified as BLM sensitive species. These species are typically found in open habitats including grassland, sagebrush shrubland, semi-desert scrub, and agricultural areas (BLM 2007a; WGFD 2005). These species have been documented within the Project region and are fairly abundant in areas of suitable habitat (WGFD 2005). Based on the presence of suitable habitat, the potential for these species to occur along the Project route is considered high.

Long-billed Curlew

The long-billed curlew (*Numenius americanus*) is classified as a BLM sensitive species. The long-billed curlew breeds in southern Canada south into portions of most of the western U.S. It winters in California, Arizona, Mexico, Texas, Louisiana, and South Carolina. The long-billed curlew occurs and breeds throughout a majority of Wyoming and Montana. This species inhabits a variety of grassland types ranging from moist meadow grasslands to agricultural areas to dry prairie uplands, usually near water. This species prefers a complex of

shortgrass prairies, agricultural fields, wet and dry meadows and prairies, and grazed mixed-grass and scrub communities (MFWP 2010h; WGFD 2005). A total of 18 acres of suitable habitat was mapped during wetland/waterbodies surveys along the Project route in 2009 and 2010. Based on the presence of suitable habitat, the potential for this species to occur along the Project route is considered high.

Mountain Plover

The mountain plover (*Charadrius montanus*) is classified as a federally proposed species as well as a BLM sensitive species. The historic breeding range of the mountain plover included short-grass prairies from extreme southern Canada, south through the Great Plains of the U.S. (WGFD 2005). Currently, mountain plovers only nest in isolated areas throughout their range. In Wyoming and Montana, the breeding range of this species is widespread and relatively common in favored habitat; however, population levels and trends are not known (MFWP 2010g; WGFD 2005). Breeding habitat for this species appears to vary geographically. However, throughout its range, suitable breeding habitat is characterized primarily by shortgrass prairie grassland where grazing is intensive, or in areas of fallow fields or active prairie dog towns (WGFD 2005). Ground surveys were conducted from April 13 to 17, 2010, and May 5 to June 4, 2010, to determine location, size, and species composition of suitable habitat. A total of 611.4 acres of suitable habitat were mapped within 0.25 mile of the Project ROW (AECOM 2010c). Based on the results of the spring 2010 mountain plover habitat surveys, the known distribution of the mountain plover in Wyoming and Montana, and documented observations within the Project region (WGFD 2005), mountain plovers could potentially occur within the project area. Therefore, the potential for this species to occur along the Project route is considered high.

Yellow-billed Cuckoo

The yellow-billed cuckoo (*Coccyzus americanus*) is classified as a BLM sensitive species. The yellow-billed cuckoo is found from southern Canada to South America, breeding across most of the U.S. (except Oregon, Washington, Idaho, and Montana) and wintering in South America. In eastern Wyoming, the only areas that currently support the large cottonwood-riparian stands that are required by this species occur in isolated stands along the Bighorn, Powder, and North Platte rivers (WGFD 2005). This species nests primarily in large stands of cottonwood-riparian habitat below 7,000 feet in elevation. The yellow-billed cuckoo is a riparian obligate species that prefers extensive areas of dense thickets and mature deciduous forests near water, and requires low, dense, shrubby vegetation for nest sites (BLM 2007a; Stoke and Stokes 1996; WGFD 2005). Based on the presence of suitable habitat along the Powder River, the potential for this species to occur along the Project route is considered moderate.

3.7 Aquatic Resources

Aquatic species found along the Project route are typical of the perennial and intermittent waterbodies found in the rolling sagebrush shrublands and grasslands of northeastern Wyoming and southeastern Montana. Most of these species have wide distributions but are primarily found in larger perennial waterbodies such as the Little Powder River. The types of information used to identify aquatic species that may occur along the Project route consist of identification of aquatic habitat and distribution/occurrence information for fish and amphibian species.

3.7.1 Habitat

Aquatic habitat along the Project includes streams, wetlands, and springs located primarily within the Powder River Basin. Most of the habitat consists of intermittent and ephemeral streams and springs that provide water only during spring run-off and seasonal storm events. Eighteen perennial streams are crossed by the Project ROW, including one that contains recreational game fish species (Little Powder River). The most significant perennial waterbody crossed by the Project is the Little Powder River.

Springs represent the other type of aquatic habitat in the overall region. Spring habitat along the Project route is limited to unnamed springs and seeps, which are wet after snowmelt and precipitation events. These areas often are associated with wetlands vegetation that provide habitat to several amphibian species, including the northern leopard frog.

3.7.2 Aquatic Communities

3.7.2.1 Fish

Coolwater and warmwater fish species are found in perennial waterbodies in the Project region. Spawning seasons for warmwater species are variable and species-specific, but spawning generally occurs between April and August and peaks in June and July. Spawning periods for various coldwater species occur from February through November, peak in April or October, and are species specific.

As presented in Section 3.4, Water Resources, the Little Powder River in the area of the Project crossing is classified as a Class 2AB waterbody. Game fish species inhabiting this section of river include rainbow trout, green sunfish, and channel catfish. Populations of channel catfish exist in the Little Powder River, but the potential for a sport fishery is very low because of the stream's small size. Native non-game species in this section of the Little Powder River include flathead chub, fathead minnow, white sucker, and longnose sucker (BLM 2003a). Several other waterbodies crossed by the Project (i.e., Salt Creek, Ranch Creek) maintain a diverse non-game fish community including several species of Cyprinid minnows that are tolerant of periodic low flow, turbid, saline, and alkaline conditions in streams of the northern Great Plains (BLM 2006).

3.7.2.2 Amphibians

Potential habitat for amphibians includes perennial and intermittent stream reaches, wetlands, springs, and ephemeral ponds. Common species found along the Project route include Woodhouse's toad, tiger salamander, chorus frog, and northern leopard frog (Baxter and Stone 1980; BLM 2007a). The northern leopard frog and Great Basin spadefoot are BLM sensitive species and are discussed in detail in Section 3.7.3, Threatened, Endangered, and Sensitive Species.

3.7.3 Threatened, Endangered, and Sensitive Species

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Five special status aquatic species, identified as BLM sensitive species, were identified as potentially occurring within the Project area (BLM 2010f, 2007a). The potential occurrence of special status species within the Project area was based on range, known distribution, and the presence of potentially suitable habitat crossed by the Project route (**Appendix E**). A total of three aquatic species were eliminated from detailed analysis (boreal toad, Columbia spotted frog, and Yellowstone cutthroat trout) based on rationale presented in **Appendix E**. The remaining species that have the potential to occur along the Project route are discussed below.

3.7.3.1 Northern Leopard Frog

The northern leopard frog (*Rana pipiens)* is classified as a BLM sensitive species. It is one of the most common and widespread amphibians in the U.S; however, populations are known to be declining throughout its range. This species is found in or near permanent water in the plains, foothills, and montane zones. They range to 11,000 feet amsl in the mountains. Their preferred habitats are swampy cattail marshes on the plains and beaver ponds in the foothills and montane zones. In Wyoming, this species is common throughout the state except in Teton County, Park County, and Yellowstone National Park (WGFD 2005). Based on the presence of suitable habitat, the potential for this species to occur along the Project route is considered high.

3.7.3.2 Great Basin Spadefoot

The great basin spadefoot (*Spea intermontana*) is classified as a BLM sensitive species. This species ranges from southern British Columbia south through the Great Basin to northern Arizona and New Mexico. Great Basin spadefoots prefer sagebrush communities below 6,000 feet amsl, although they have been found at elevations of 9,200 feet amsl. This species requires loose soil for burrowing. In Wyoming, this species is most abundant west of the Continental Divide in the Wyoming Basin and the Green River Valley, but in the center of the state, it crosses the Divide into Fremont and Natrona counties (WGFD 2005). Suitable habitat occurs along the Project route, most occurrence records for this species in Wyoming are southwest of the Project route; therefore, the potential for this species to occur along the Project route is considered low.

3.8 Land Use and Recreation

3.8.1 Land Use

Existing land use along the Project consists primarily of livestock grazing, wildlife habitat, open space (range land), and dispersed recreation. Existing pipelines and utilities also are located in the immediate vicinity of the Project area. The Project would parallel other utilities for approximately 210 miles, or 91 percent of the total pipeline length. The Project would traverse lands under the regulatory and management control of the BLM, the State of Wyoming, and private land, which is regulated by county land use plans and ordinances. Approximately 66 percent (153 miles) of the Project would cross private lands, 28.5 percent (66 miles) would cross federal lands, and 5.5 percent (13 miles) would cross state lands.

The lands under the regulatory and management control of the BLM include portions of the Lander, Casper, Buffalo, and Miles City FO areas. The Project does not transect any BLM land in Montana. BLM-administered lands are open for the location of utility and transportation systems. These systems are required to be concentrated in existing utility corridors whenever possible (BLM 1987).

The management of public lands and resources in the Lander FO area is directed and guided by the BLM's Final RMP/EIS (BLM 1986) and the Record of Decision for the Lander RMP (BLM 1987). Approximately 4.7 miles of the Project occurs within the Lander FO area. There are no special designations transected by the Project.

The management of public lands and resources in the Casper FO area is directed and guided by the Record of Decision for the Casper RMP (BLM 2007d). The West-Wide Energy Corridor (WWEC) is a multi-modal corridor designated along U.S. Highway 20/26 to accommodate major ROWs. The WWEC has an approximate width of 3,500 feet. Approximately 38 miles (MP 0 to MP 38) of the Project would be located in this corridor. Approximately 14 miles of the Project (MP 32 to MP 46), would follow the general corridor along U.S. Highway 20/26. Approximately 5.8 miles of the Project would be located on BLM land through this area. The Casper FO area RMP states that cross-country ROW placements would be allowed only when placement in a designated corridor is not practical or feasible (BLM 2007d).

The Wind River Basin Management Area near Waltman, Wyoming, within the Casper FO area, is crossed by the Project, which also comes within 5 miles of the Salt Creek Management Area. Management objectives for both the Wind River Basin and Salt Creek management areas emphasize oil and gas development with minimum restrictions (BLM 2007a).

The management of public lands and resources in the Buffalo FO area is directed and guided by the Record of Decision for the RMP (BLM 2001a). The Buffalo FO area's management policy is to locate transmission and transportation facilities within designated corridor areas (BLM 2001a). There are several designated corridors within the FO area. The Project is not located within any of the designated corridors. The Buffalo FO area RMP states that transmission lines are to be located to the extent feasible within identified corridor areas (BLM 2001a).

3.8.2 Recreation

Recreation resources are areas that are designated for the enjoyment and relaxation of both residents and visitors. These areas include lands formally managed for recreation purposes such as recreation sites or parks and other areas where no facilities are provided, such as sightseeing, hiking, rock climbing, hunting, fishing, or off-highway vehicle (OHV) use areas. Recreation resources can be further categorized as non-urban or dispersed resources such as rural parks, campgrounds, rivers, or undeveloped open lands. Rural-based recreation typically takes place in open spaces and does not include facilities associated with infrastructure. Urban-oriented developed resources such as parks and recreation facilities are typically within the boundaries of cities and towns.

The primary population centers in the project area occur in the communities and cities of Casper, Midwest, Lander, Natrona, Edgerton, Kaycee, Powder River, and Gillette. Casper and Gillette are the largest

municipalities and are relatively centrally located along the Project. Therefore, it is likely that the majority of pipeline workers would temporarily reside in these cities during construction. Camping by construction workers and their families could occur in areas where other housing is not readily available or where workers would otherwise prefer to camp. Details regarding housing availability, including recreational vehicle (RV) sites and campgrounds, are provided in Section 3.11.

Non-urban recreation resources in the Project area are primarily available on public lands managed by the BLM. Most of the recreational use on public land in the Lander FO area is widely dispersed. Visitors generally participate in a wide variety of recreational activities, including picnicking, hunting, camping, winter sports, and fishing (BLM 1986). OHV use is limited to existing roads and trails (BLM 1986).

The Project does not cross any Recreation Management Areas (RMAs) or developed recreation areas in the Casper FO area (BLM 2007a). OHV use in the Project is limited to existing roads and vehicle trails; however, temporary OHV use is allowed 300 feet from an existing road or trail for performance of necessary tasks (BLM 2007a).

The Project does not cross any RMAs or developed recreation areas in the Buffalo FO area (BLM 2001a). OHV use in the Project area is closed, open, or limited to designated roads and trails (BLM 2001a).

Big game hunting occurs throughout the Project area and is regulated by the WGFD. In the Lander and Casper FO areas, the southern edge of the Bighorns (Lost Cabin to Arminto, MP 0.0 to MP 20) is highly desirable for elk, mule deer, and antelope. Heavy use is made along the route from Natrona to Midwest and up to Gillette. North of Gillette, in the BLM Buffalo and Miles City FO areas, elk, mule deer, white tail deer, and turkey are the commonly hunted species. Access to public lands is increasingly difficult to the north and east.

3.9 Wilderness

There are no designated wilderness areas within 50 miles of the Project ROW. However, there are two WSAs within 50 miles of the Project ROW including the Fortification Creek WSA in the Buffalo FO and the Buffalo Creek WSA in the Miles City FO (**Figure 3-4**). These areas maintain a primeval character, without permanent improvements and generally appear to have been affected primarily by the forces of nature. WSAs are not included in the National Wilderness Preservation System until the U.S. Congress passes wilderness legislation.

The Fortification Creek WSA is located approximately 12 miles west of the Project ROW near MP 159 in Wyoming. This area contains unique undeveloped terrain along the Powder River. Sharp breaks, ridges, and ephemeral drainages cross this WSA. This WSA provides important habitat for a population of elk that were re-established in the region during the 1950s from Yellowstone National Park. Due to this WSA being surrounded on all sides by private land, public access is not available without landowner permission (BLM 2001a).

The Buffalo Creek WSA is located approximately 28 miles west of the Project ROW near MP 210 in Montana. This WSA is 5,650 acres in size and occurs in the rugged breaks of the Powder River. The Buffalo Creek WSA meets minimum standards for solitude because of the rugged terrain and widespread cover of trees. Currently, hiking and hunting are the only recreational uses within the WSA (BLM 2000a).

3.10 Visual Resources and Noise

3.10.1 Visual Resources

Scenic quality is the measure of the visual appeal of a unit of land. Section 102 (a) of the Federal Land Policy and Management Act (FLPMA 1976), states that "...the public lands are to be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values." Section 103(c) identifies "scenic values" as one of the resources for which

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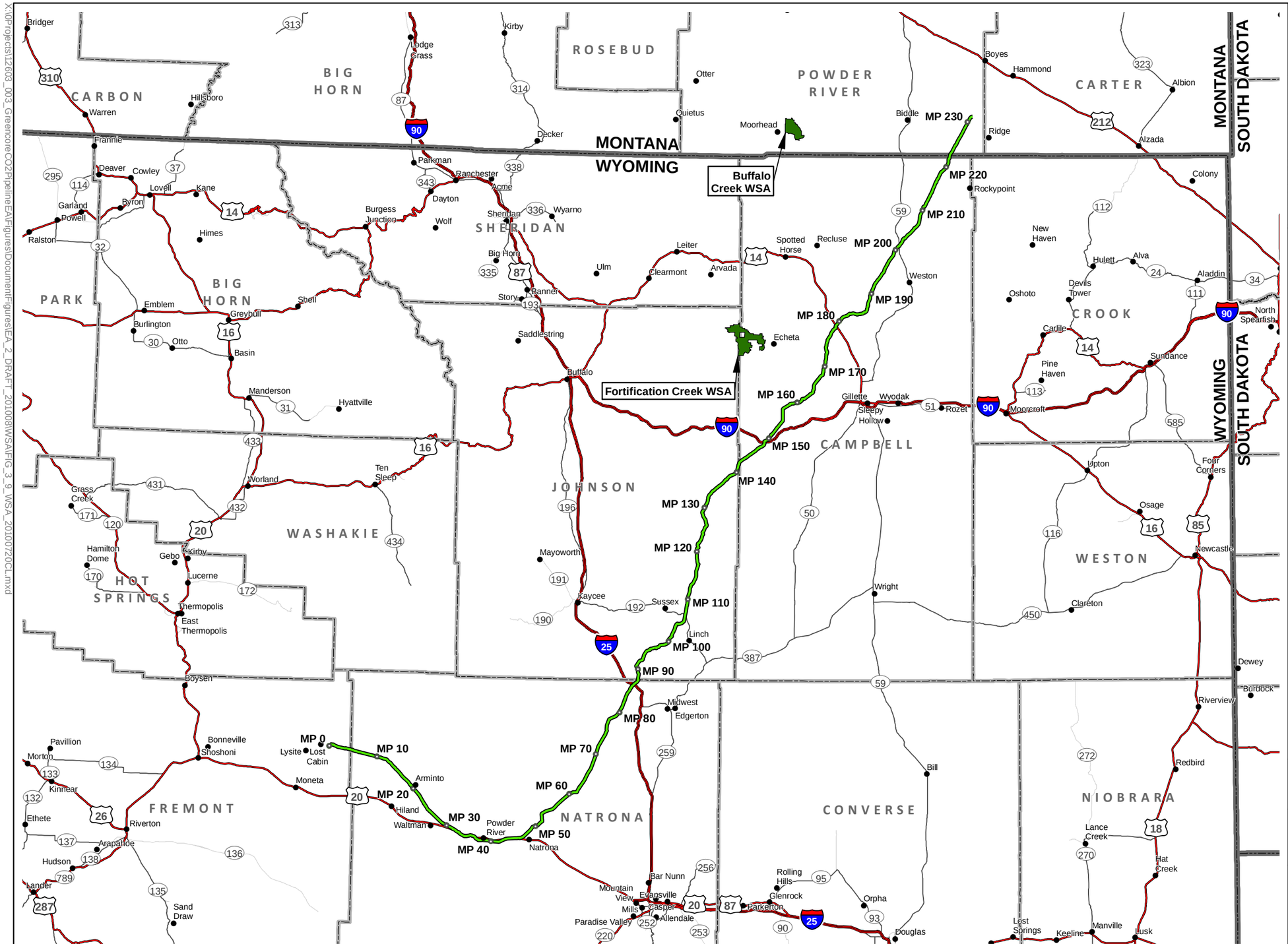

Legend

- City or Town
- Milepost
- Proposed Main Centerline
- Wilderness Study Area (WSA)
- Interstate Highway
- U.S. Highway
- State Highway
- Local Road
- State Boundary
- County Boundary

Centerline: July 20, 2010
Print Date: August 9, 2010

0 5 10 20 Miles
0 5 10 20 Kilometers

1:1,250,000

Greencore CO_2 Pipeline Project

Figure 3-4

Wilderness Study Areas (WSA) in the Project Vicinity

public land should be managed. Section 201(a) states that "the Secretary shall prepare and maintain on a continuing basis an inventory of all public lands and their resources and other values (including scenic values)..." Section 505(a) requires that "each ROW shall contain terms and conditions which will...minimize damage to the scenic and esthetic values..."

Section 101 (b) of the NEPA requires that measures be taken to ensure that aesthetically pleasing surroundings be retained for all Americans.

Under FLPMA, BLM developed and applies a standard visual assessment methodology, known as the Visual Resource Management System (VRM), to inventory and manage scenic values on lands under its jurisdiction. Guidelines for applying the system are described in BLM Manual 8400 et seq.

BLM VRM class objectives, which are used in management and in the assessment of potential Project impacts and identification and application of mitigation measures, are:

VRM Class I: Preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

VRM Class II: Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

VRM Class III: Partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

VRM Class IV: Provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. Every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements.

The proposed Greencore CO_2 Pipeline project crosses VRM Class II, Class III, and Class IV areas, with approximately 5 percent of the land designated Class II, 15 percent Class III, and 80 percent Class IV.

The Project would closely parallel existing pipelines for approximately 91 percent of its length.

The characteristic landscape of the pipeline corridor is contained within the elevated plains and isolated mountains of the Wyoming Basin physiographic province and the flat to gently sloping Missouri Plateau Region (unglaciated section) of the Great Plains physiographic province (Fenneman 1931). The Project crosses through a mix of rangeland and agricultural fields in Wyoming and Montana. Cottonwood dominated riparian vegetation characterizes crossings of the South Fork of the Powder River, Powder River and Little Powder River. Rangeland vegetation is dominated by mixed shrub grasslands. **Figures 3-5** through **3-13** illustrate eight characteristic views of the study area landscape from KOPs 1 through 8. Human modifications to the natural landscape character are sparsely scattered, most commonly back country roads with occasional clusters of ranch buildings and fences. There are few populated settlements.

The Project would cross the Bozeman Trail twice and Texas Trail once. Both trails are historic trails but are not designated as "National" historic trails. The specific location of the Texas Trail is unknown in the vicinity of the project.

The Interstate, U.S. and State highways that afford public viewing opportunities of the Project include I-25, I-90, U.S. 20, U.S. 14/16, SH 192 and SH 59 in Wyoming. The Project also is visible from less-traveled roads and homes within its viewsheds in Wyoming and Montana. The Project is not visible from designated recreation areas, cities, towns, or villages. The Bighorn Backcountry Byway, I-25, I-90, U.S. 20, U.S. 14/16, and Wyoming SH 192 and SH 59 are selected KOPs.

3.10.2 Noise

The Project would be constructed entirely through rural areas where the nearest residences would be at least 0.5 mile from the ROW. In addition, the pipe yard work area would be located in a rural area located northwest of Casper. The closest residence to the pipe yard would be greater than 0.25 mile.

Existing noise sources in rural areas are predominantly natural (i.e., wind, birds). Areas near highways would exhibit vehicle-related noise. The BLM has estimated that the average noise level in the Casper FO area is between 30 and 40 A-weighted decibels (BLM 1997). This range also is suggested in other EAs and in EISs and has been confirmed by field measurements taken elsewhere in Wyoming (Kruger 1981). The background level can be affected by atmospheric conditions, wind levels, topography, vegetation, time of day, bird, and human activity.

3.11 Socioeconomics

This section summarizes historical and current socioeconomic conditions in the five counties (Fremont, Natrona, Johnson, Campbell, and Powder River) that would be affected by the Project. All of the affected counties, with the exception of Powder River County, Montana, are within Wyoming. Elements reviewed include population, economic conditions, income, employment, housing, local government facilities and services, and local government fiscal conditions. **Tables 3-15** through **3-19** summarize baseline conditions within the five-county Project area.

3.11.1 Population

The Project area is predominantly rural and sparsely populated. The estimated population in Fremont, Natrona, Johnson, and Campbell counties has increased from 2000 to 2008. Population in Powder River County declined slightly over the same period. Since 2000, population has increased an estimated 6.4 percent in Fremont County, 9.9 percent in Natrona County, 19.6 percent in Johnson County, and 23.1 percent in Campbell County (**Tables 3-15** through **3-19**). Population in Powder River County decreased an estimated 8.8 percent since 2000 (U.S. Census Bureau 2008).

3.11.2 Economic Conditions

The primary industries for all five counties within the Project area include energy production (oil and gas), retail trade, services, and government. In **Tables 3-15** through **3-19,** oil and gas employment is incorporated under mining. As is evidenced in the data, employment in the oil and gas industry has steadily risen in recent years.

In the early 1980s, Fremont County depended on uranium mining and milling as the mainstay of the local economy. When the industry collapsed in 1983, the economy of Fremont County declined steadily until the latter part of the decade. More recently, Fremont County's economy has improved with a 44 percent increase in personal income between 2003 and 2008 (Wyoming Department of Administration and Information 2008). An increase in wealthy, out-of state people also has contributed to increased incomes in Fremont and Natrona counties.

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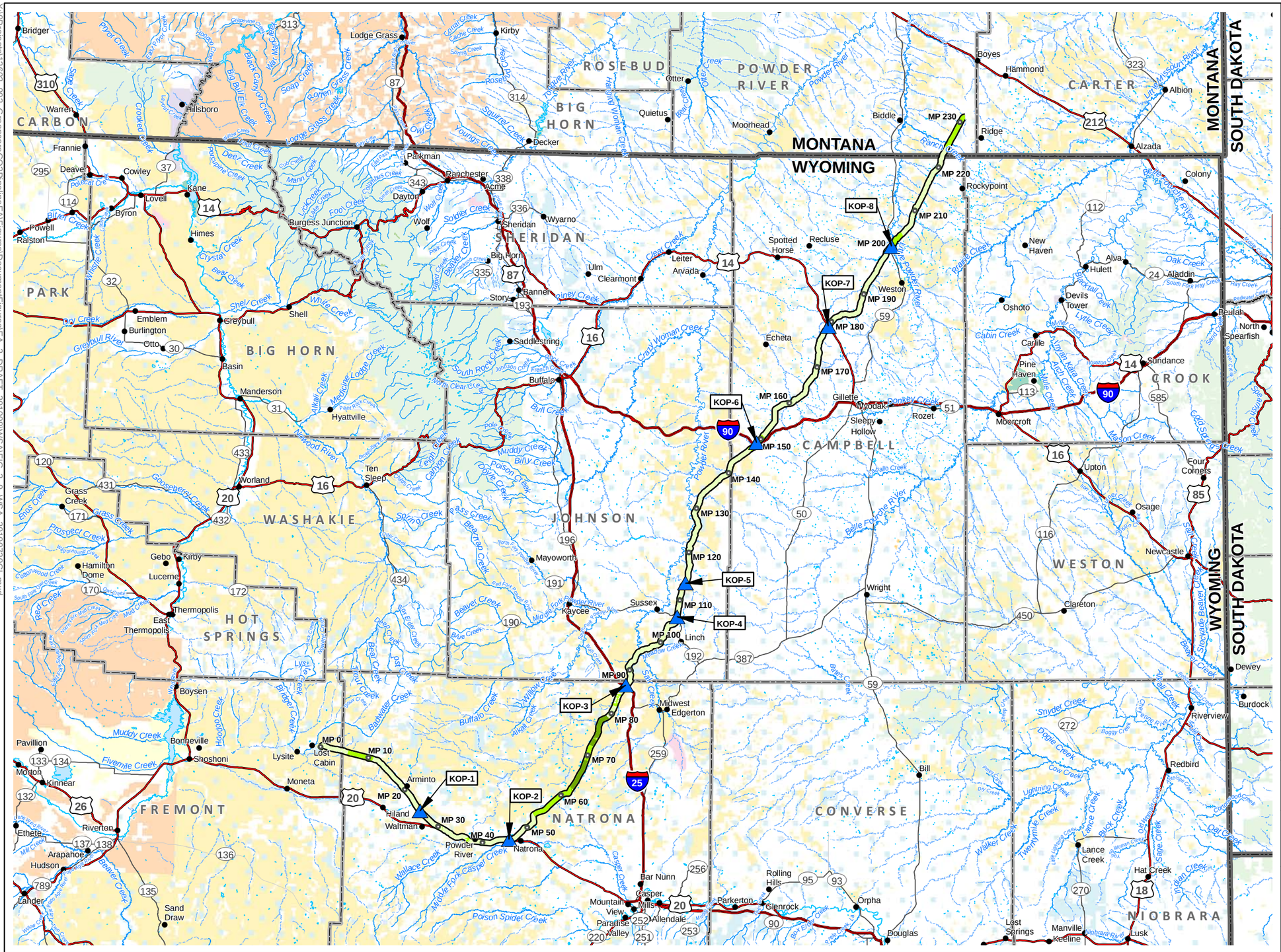

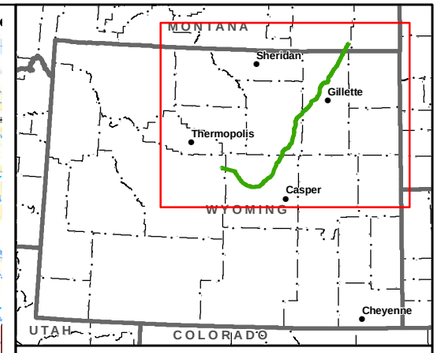

Legend

- City or Town
- Milepost
- Key Observation Point (KOP)

VRM Classification

- Class II
- Class III
- Class IV
- Interstate Highway
- U.S. Highway
- State Highway
- Local Road

Rivers/Streams

- Perennial
- Intermittent
- State Boundary
- County Boundary

Jurisdiction

- Bureau of Indian Affairs/Tribal
- Bureau of Land Management
- Bureau of Reclamation
- DOD/USACE
- Fish & Wildlife
- US Forest Service
- National Park Service
- State

Centerline: July 20, 2010
Print Date: November 5, 2010

0 5 10 20 Miles
0 5 10 20 Kilometers

1:1,250,000

Greencore CO_2 Pipeline Project

Figure 3-5
VRM Classes and
Key Observation Point Locations

Figure 3-6 View northeast from KOP-1 along South Bighorn Backcountry Byway

Figure 3-7 View north from KOP-2 along U.S. 20

Figure 3-8 View east from KOP-3 along I-25

Figure 3-9 View northwest from KOP-4 along SH 192

Figure 3-10 View southwest from KOP-5 along Bozeman Trail

Figure 3-11 View northeast from KOP-6 along I-90

Figure 3-12 View northeast from KOP-7 along U.S. 14/16

Figure 3-13 View west from KOP-8 along SH 59

Table 3-15 Fremont County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Total Population[1]	35,810	35,962	36,300	36,829	37,479	37,870	5.8[2]
Percent Change/Previous Year	0.03	0.4	0.9	1.5	1.8	1.0	
Labor Force[3]	17,763	17,595	17,760	17,725	18,015	18,353	3.3
Percent Change/Previous Year	-2.2	-0.9	0.9	-0.2	1.6	1.9	
Employment	16,733	16,679	16,898	16,941	17,320	17,602	5.2
Unemployment	1,030	916	862	784	695	751	-27.1
Unemployment Rate	5.8	5.2	4.9	4.4	3.9	4.1	-29.3
Farm Employment	1,162	1,159	1,160	1,147	1,100	NA	-5.3
Total Non-Agricultural Employment[1]	20,374	20868	21,571	22,133	22,940	NA	12.6[3]
Mining	497	578	761	961	1,016	NA	104.4[3]
Construction	1,657	1,705	1,773	1,802	1,969	NA	18.8[3]
Manufacturing	601	607	622	628	641	NA	6.7[3]
Retail Trade	2,546	2,557	2,612	2,659	2,737	NA	7.5[3]
Transportation and Warehousing	530	530	569	607	635	NA	19.8[3]
Finance and Insurance	531	535	531	535	511	NA	-3.8[3]
Real Estate and Rental and Leasing	688	718	889	988	1,130	NA	64.2[3]
Professional, Scientific, and Tech Services	753	838	816	837	901	NA	19.7[3]
Administrative and Waste Services	472	497	441	473	547	NA	15.9[3]
Health Care and Social Assistance						NA	
Accommodation and Food Services	1,613	1,670	1,688	1,672	1,688	NA	4.6[3]
Other Services, Except Public Administration	1,299	1,343	1,392	1,425	1,490	NA	14.7[3]
Government and Government Enterprises	5,264	5,240	5,332	5,377	5,471	NA	3.9[3]
Personal Income (Million $)[1]	$924.1	$995.6	$1,089	$1,209.4	$1,330.3	NA	44.0[3]

Table 3-15 Fremont County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Per Capita Income[1]	$25,814	$27,701	$30,023	$32,890	$35,512	NA	37.6[3]
2008 Average Mill Levy (mills)[1]						73.193	
2008 Total Assessed Valuation (Million $)[1]						$344.8	
Gross Sales Tax (Thousand $)[1]	$21,223	$23,843	$27,291	$30,954	$32,550	$44,235	108.4

[1] Wyoming Department of Administration and Information 2008.

[2] Wyoming Department of Employment 2008.

[3] 2003 to 2007.

Table 3-16 Natrona County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Total Population[1]	67,977	68,692	69,478	70,252	71,750	72,680	6.9
Percent Change/Previous Year	0.9	1.1	1.1	1.1	2.1	1.3	
Labor Force[2]	37986	38651	39220	40071	40201	40563	6.8
Percent Change/Previous Year	1.4	1.8	1.5	2.2	0.3	0.9	
Employment	36,271	37,197	37,827	38,847	39,129	39,400	8.6
Unemployment	1,715	1,454	1,393	1,224	1,072	1,163	-32.2
Unemployment Rate	4.5	3.8	3.6	3.1	2.7	2.9	-35.6
Farm Employment	438	437	433	429	411	NA	-6.2[3]
Total Non-Agricultural Employment[1]	45,912	47814	49622	51800	53516	NA	16.6[3]
Mining	3606	4061	4597	5475	5131	NA	42.3[3]
Construction	3312	3464	3679	3918	4264	NA	28.7[3]
Manufacturing	1729	1784	1976	2151	2217	NA	28.2[3]
Retail Trade	6028	6280	6383	6420	6622	NA	9.9[3]
Transportation and Warehousing	NA	NA	NA	NA	NA	NA	NA
Finance and Insurance	1786	1841	1800	1830	1830	NA	2.5[3]
Real Estate and Rental and Leasing	1890	1961	2200	2405	2746	NA	45.3[3]
Professional, Scientific, and Tech Services	2134	2264	2340	2416	2561	NA	20.0[3]
Administrative and Waste Services	2655	2343	2179	2238	2291	NA	-13.7[3]
Health Care and Social Assistance	5333	5515	5664	5785	5965	NA	11.9[3]
Accommodation and Food Services	3163	3364	3471	3553	3736	NA	18.1[3]
Other Services, Except Public Administration	2690	2805	3017	3143	3282	NA	22.0[3]
Government and Government Enterprises	5736	5783	5825	5882	6053	NA	5.5[3]
Personal Income (Million $)[1]	$2,410.4	$2,613.7	$2943.9	$3,413	$3,771.7	NA	56.5[3]

Table 3-16 Natrona County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Per Capita Income[1]	$35,479	$38,081	$42,414	$48,605	$52,543	NA	48.1[3]
2008 Average Mill Levy (mills)[1]						68.529	
2008 Total Assessed Valuation (Million $)[1]						$661.9	
Gross Sales Tax (Thousand $)[1]	$65,891	$76,674	$83,221	$95,483	$101,744	$113,622	72.4

[1] Wyoming Department of Administration and Information 2008.

[2] Wyoming Department of Employment 2008.

[3] 2003 to 2007.

Table 3-17 Johnson County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Total Population[1]	7,472	7,525	7,651	7,820	8,142	8,330	11.5
Percent Change/Previous Year	1.6	0.7	1.7	2.2	4.1	2.3	
Labor Force[2]	3626	3688	3793	3844	3914	4060	12.0
Percent Change/Previous Year	1.4	1.8	2.8	1.3	1.8	3.7	
Employment	2266	2249	2223	2240	2285	2335	3.0
Unemployment	167	137	147	123	133	149	-10.8
Unemployment Rate	4.6	3.7	3.9	3.2	3.4	3.7	-19.6
Farm Employment	456	457	453	448	429	NA	-5.9[3]
Total Non-Agricultural Employment[1]	4700	4861	5118	5382	5625	NA	19.7[3]
Mining	322	309	348	448	513	NA	59.3[3]
Construction	455	498	602	667	636	NA	39.8[3]
Manufacturing	94	117	122	108	85	NA	-9.6[3]
Retail Trade	565	524	532	541	537	NA	-5.0[3]
Transportation and Warehousing	154	150	162	165	179	NA	16.2[3]
Finance and Insurance	222	220	229	213	213	NA	-4.1[3]
Real Estate and Rental and Leasing	210	250	281	311	370	NA	76.2[3]
Professional, Scientific, and Tech Services	181	208	228	260	271	NA	49.7[3]
Administrative and Waste Services	123	134	NA	NA	NA	NA	NA
Health Care and Social Assistance	NA	NA	NA	NA	NA	NA	NA
Accommodation and Food Services	508	514	519	531	555	NA	9.3[3]
Other Services, Except Public Administration	266	280	286	298	287	NA	7.9[3]
Government and Government Enterprises	924	949	942	957	996	NA	7.8[3]
Personal Income (Million $)[1]	$231.1	$242.5	$266.8	$298.1	$329.3	NA	42.5[3]

Table 3-17 Johnson County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 - 2008
Per Capita Income[1]	$30,923	$32,237	$34,897	$38,179	$40,462	NA	30.8[3]
2008 Average Mill Levy (mills)						70.252	
2008 Total Assessed Valuation (Million $)						$177.3	
Gross Sales Tax (Thousand $)	$6,193	$6,924	$8,552	$14,285	$16,973	$16,142	160.7

[1] Wyoming Department of Administration and Information 2008.

[2] Wyoming Department of Employment 2008.

[3] 2003 to 2007.

Table 3-18 Campbell County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 – 2008
Total Population[1]	36,080	36,251	37,053	38,480	40,433	41,510	15.0
Percent Change/Previous Year	0.6	0.5	2.2	3.9	5.1	2.7	
Labor Force[3]	21,657	21,783	23,245	25,049	26,127	27,097	25.1
Percent Change/Previous Year	-2.0	0.6	6.7	7.8	4.3	3.7	
Employment	20,856	21,104	22,623	24,499	25,586	26,544	27.3
Unemployment	801	679	622	550	541	553	-31.0
Unemployment Rate	3.7	3.1	2.7	2.2	2.1	2.0	-45.9
Farm Employment	611	609	611	603	580	NA	-5.1[3]
Total Non-Agricultural Employment[1]	24486	25198	27102	29900	31870	NA	30.2[3]
Mining	6528	6851	7338	8338	8482	NA	29.9[3]
Construction	2316	2292	2717	3298	3977	NA	71.7[3]
Manufacturing	524	553	629	673	714	NA	36.3[3]
Retail Trade	2367	2382	2464	2624	2871	NA	21.3[3]
Transportation and Warehousing	939	1036	1246	1452	1518	NA	61.7[3]
Finance and Insurance	429	421	452	494	528	NA	23.1[3]
Real Estate and Rental and Leasing	372	403	449	516	613	NA	64.8[3]
Professional, Scientific, and Tech Services	801	851	934	1041	1071	NA	33.7[3]
Administrative and Waste Services	821	704	852	883	977	NA	19[3]
Health Care and Social Assistance	1067	972	968	994	1050	NA	-1.6[3]
Accommodation and Food Services	1655	1674	1752	1915	1982	NA	19.8[3]
Other Services, Except Public Administration					1467	NA	NA
Government and Government Enterprises	3653	3849	3914	3909	4035	NA	10.5[3]
Personal Income (Million $)[1]	$1,135.1	$1,244.3	$1,450.2	$1,704.3	$1,906.4	NA	68.0[3]

Table 3-18 Campbell County Economic/Demographic Profile for the Greencore Project

	2003	2004	2005	2006	2007	2008	Percent Change 2003 – 2008
Per Capita Income[1]	$31,480	$34,350	$39,172	$44,317	$47,151	NA	49.80[3]
2008 Average Mill Levy (mills)[1]						60.494	
2008 Total Assessed Valuation (Million $)[1]						$637.5	
Gross Sales Tax (Thousand $)[1]	$80,733	$85,140	$96,803	$137,792	$155,140	$173,821	115.3

[1] Wyoming Department of Administration and Information 2008.

[2] Wyoming Department of Employment 2008.

[3] 2003 to 2007.

Table 3-19 Average Weekly Wage for Counties Crossed by the Greencore Project

County and Sector	Dollars					
	2003	2004	2005	2006	2007	2008
Fremont						
Construction	532	551	565	610	639	694
Mining	1,045	1,189	1,215	1,276	1,212	1,313
Natrona						
Construction	617	650	695	736	835	949
Mining	925	1,009	1,135	1,267	1,453	1,572
Johnson						
Construction	562	583	669	791	804	860
Mining	671	706	760	876	966	1,057
Campbell						
Construction	658	721	768	864	944	1065
Mining	1,129	1,189	1,205	1,328	1,368	1,399
Powder River						
Construction	311	299	244	330	310	341
Mining	NA	NA	NA	NA	NA	NA

Source: Wyoming Department of Employment (2008); Montana Department of Labor (2008).

In addition to the oil, gas, and mining economic base in Natrona County, the city of Casper is currently considered a statewide regional trade center. Casper has experienced growth in retail sales and services over the past several years despite a declining population. Johnson County strongly depends upon ranching. The economy as a whole has improved, as evidenced by a 43 percent increase in personal income from 2003 to 2008 (Wyoming Department of Administration and Information 2008).

Campbell County depends more on coal mining than oil and gas production; coal has been a stabilizing economic force in Campbell County. The county has experienced a dramatic 68 percent increase in personal income from 2003 to 2008 (Wyoming Department of Administration and Information 2008).

Powder River County, Montana, is primarily rural and agricultural, although significant reserves of oil and gas do exist in the county. The majority of the county is grazing land and farm acreage fluctuates between 1.54 and 1.72 million acres. While the number of ranches has decreased, the size of ranches has increased. From 2003 to 2008, personal income increased 5 percent (Bureau of Economic Analysis [BEA] 2008).

All five counties depend to some extent on the tourist industry, which is reflected in the retail trade and service sectors.

3.11.3 Income

Tables 3-15 through **3-19** show estimated personal and per capita income for each of the five counties in the Project area. All five counties show increases in county-wide personal income from 2003 to 2008. Average weekly wages in the mining and construction sectors are shown in **Table 3-20**. Wage rates in both sectors have increased through the period. Energy production is considered the highest paying sector for wage and salary employment.

Table 3-20 Temporary Housing Accommodations for the Greencore Project

Type/Location of Accommodation	Number of Locations	Number of Units	Number of Tent Sites	Number of Trailer Sites	Dates Available
Hotel/Motel, Casper	23	2,003	NA	NA	NA
Hotel/Motel, Buffalo	15	471	NA	NA	NA
Hotel/Motel, Edgerton-Midwest	1	20	NA	NA	NA
Hotel/Motel, Kaycee	4	36	NA	NA	NA
Hotel/Motel, Gillette	19	1,488	NA	NA	NA
Hotel/Motel, Lander	8	328	NA	NA	NA
Hotel/Motel, Riverton	14	531	NA	NA	NA
Hotel/Motel, Jeffrey City	1	10	NA	NA	NA
Hotel/Motel, Shoshoni	2	37	NA	NA	NA
Campground, Casper	9 (4 private, 2 BLM, 3 county)		185	296	4 year-round, 5 seasonal
Campground, Kaycee	3 (3 private)		26	18	3 year-round
Campground, Buffalo	8 (3 private, 5 FS)		97	207	3 year-round, 5 seasonal
Campground, Lander	12 (6 private, 1 BLM, 5 USFS)		168	198	5 year-round, 7 seasonal
Campground, Riverton	2 (2 private)		16	70	2 year-round
Campground, Gillette	2 (2 private)		75	75	2 year-round

Source: Wyoming Travel and Tourism (2009); Delorme (2003).

3.11.4 Employment

Total employment throughout the area has increased from 2003 through 2008. As shown in **Tables 3-15** through **3-19**, total non-agricultural employment has increased by 12.6 percent in Fremont County; 16.6 percent in Natrona County; 19.7 percent in Johnson County, 30.2 percent in Campbell County, and 3.4 percent in Powder River County from 2003 to 2007. Employment in real estate, mining, and construction showed the greatest increase in most of the affected counties. Data for many of the industries in Powder River County is lacking, due to the sensitive nature of the data. Employment in other industries fluctuated during the period, with decreases in the manufacturing sector in all counties except Campbell County, and increases in the trade sector in all four counties.

Unemployment rates in the five counties have generally trended down between 2003 and 2007. Fremont, Natrona, and Johnson counties experienced a slight increase in 2008.

3.11.5 Housing

Towns and municipalities in close proximity to the Project include Casper, Lander, Natrona, Midwest, Kaycee, and Gillette. Casper and Gillette are the largest municipalities and are centrally located to the Project. Given the short duration of the construction period, it is expected that the majority of workers from outside the area would use temporary accommodations in campgrounds/RV parks and hotels/motels.

Table 3-20 shows temporary housing available in close proximity to the Project. Hotels/motels and campgrounds with RV sites are available in all study area communities. Similarly, demand for these accommodations also may be greater in these communities, particularly during peak tourist seasons such as during the summer months and during hunting seasons.

The average monthly rent for a two-bedroom apartment in Natrona County is $702, as of the second quarter, 2008. For a two to three-bedroom single family home, the average rental rate is $1,088 per month, and the average rental rate for a mobile home is $548 per month (Wyoming Department of Administration and Information 2008).

3.11.6 Local Government Facilities and Services

Fremont, Natrona, Johnson, Campbell, and Powder River county governments all provide a wide array of governmental services including general county government, law enforcement, fire protection, road and bridge infrastructure, solid waste disposal, medical and ambulance, and education. Public facilities and services in the major towns, namely Casper and Gillette, adequately serve the existing population and could support housing and services to pipeline personnel,

3.11.7 Local Fiscal Conditions

As shown in **Tables 3-15** through **3-19**, gross sales tax receipts have increased in all five study area counties during the period 2003-2008. Properties assessed by the state, including pipelines, are assessed, and taxed on 4 percent of value (AECOM 2010d). Property taxes are a primary source of county and school district revenue. Tax revenues are allocated to county funds, school districts, special districts, and municipalities.

3.12 Environmental Justice

Since publication of EO 12898, Federal Action to Address Environmental Justice in Minority Populations and Low-Income Populations in the Federal Register on February 11, 1994 (59 FR 7629), federal agencies have been developing a strategy for implementing the Order. Currently, the federal agencies rely on the Environmental Justice Guidance under the NEPA prepared by the CEQ (the guidance) (USEPA1997), in implementing EO 12898 in preparing NEPA documents.

Pursuant to EO 12898 on Environmental Justice, federal agencies shall make the achievement of environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations, low-income populations, and Indian tribes, and allowing all portions of the population an opportunity to participate in the development of, compliance with, and enforcement of federal laws, regulations, and policies affecting human health or the environment regardless of race, color, national origin, or income. EO 12898 requires identifying whether an area potentially affected by a proposed federal action may include minority populations and low-income populations and seek input accordingly.

3.12.1 Minority Populations

Projects or programs that are proposed, funded, or licensed by federal agencies must take into account impacts on minority or low-income populations. A description of the population types (i.e., races) residing within the counties that would be crossed by the Project is presented in **Table 3-21**. This information is based on U.S. Census Bureau data. The table also includes the percent of the population whose income lies below the poverty level.

The guidance states that “a minority population may be present if the minority population percentage of the affected area is ‘meaningfully greater’ than the minority population percentage in the general population or other ‘appropriate unit of geographic analysis’ (USEPA 1997).” For the purpose of this EA analysis, the “affected area” is defined as any county that the Project crosses.

Table 3-21 Race and Poverty Characteristics of Affected Counties in the Greencore Project Area

State/County	Race as a % of Total Population (estimated) [1,2]						Population at or Below Poverty Level, % 2008[1]	Median Household Income, $ 2008[1]
	White 2009	Black or African American 2009	American Indian and Alaska Native 2009	Asian 2009	Two or More Races 2009	Hispanic or Latino Origin 2009[2]		
Wyoming								
Fremont	76.1	1.0	20.3	0.5	2.1	5.9	13.5	45,708
Natrona	94.7	1.6	1.4	0.7	1.5	6.4	8.8	51,486
Johnson	97.8	0.1	0.6	0.1	1.3	3.5	8.3	51,162
Campbell	95.7	0.7	1.4	0.7	1.4	6.2	5.8	75,244
Average for Entire State	**93.5**	**1.4**	**2.6**	**0.8**	**1.5**	**8.1**	**9.5**	**54,735**
Montana								
Powder River	97.4	0.0	2.0	0.1	0.5	1.1	13.0	36,933
Average for Entire State	**90.3**	**0.7**	**6.4**	**0.7**	**1.8**	**3.1**	**14.1**	**43,968**

[1] U.S. Census Bureau 2010.

[2] People who identify their origin as Hispanic or Latino may be of any race. Thus, the percent Hispanic or Latino should not be added to the race as percentage of population categories.

The Project would pass through five counties, including Fremont, Natrona, Johnson, and Campbell counties in Wyoming, and Powder River County in Montana. Most of the Project area is sparsely populated and dotted with numerous oil well fields and sprawling cattle ranches. There are eight communities that are within 5 miles and could be affected by the project. These communities are Lost Cabin, Lysite, Arminto, Waltman, Powder River, Natrona, Linch, and Sussex. According to the most recent U.S. Census Bureau data, the 2000 population of Powder River was 51 (U.S. Census Bureau 2000). Population data for the other affected communities were not available.

Minority population percentages were available through the U.S. Census Bureau for the county level and are detailed in **Table 3-21**.

According to estimated 2009 U.S. Census Bureau statistics, the populations of all the affected counties were primarily white. The largest minority population in Powder River County, Montana, was American Indian, followed by those of Hispanic or Latino Origin. The largest minority population for most of the affected counties in Wyoming was Hispanic or Latino. The outlier was the American Indian population in Fremont County, which at 20.3 of the county population, was well above the Wyoming state average of 2.6 percent. This large American Indian population can be attributed to the Wind River Indian Reservation, which is within Fremont County. Approximately 5 miles, or 2 percent of the Project, lies within Fremont County. The Project is not located within the boundaries of the Reservation.

3.12.2 Low-Income Populations

The guidance recommends that low-income populations in an affected area be identified using the annual statistical poverty thresholds from the Bureau of Census. In identifying low-income populations, agencies may consider a community as either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure. For the purpose of this EA analysis, the “affected area” is defined as any county that the Project crosses.

As stated previously, the Project would pass through a rural and sparsely populated area. Median household incomes for all the affected Wyoming counties, with the exception of Campbell County, were slightly below the state average. The median household income for Powder River County, Montana was 16 percent below the Montana state average of $43,978.

The poverty threshold was based on a 3-person household. The U.S. Census Bureau 2008 poverty threshold definition for a 3-person household was $17,163 (U.S. Census Bureau 2008). The 2008 median household income for all of the affected counties indicates a general level of income that was well above the poverty threshold.

3.13 Transportation

Four major federal highways and two state highways would be crossed by the Project. I -25 would be crossed at approximately MP 86.5, which connects south to Casper, Cheyenne, and Denver and north to Buffalo. I-25 is a four-lane, divided highway developed to Interstate Systems standards. The Project intersects I-90 at approximate MP 149. I-90 connects east to Rapid City and west to Sheridan and Billings, Montana. It also is a four-lane, divided highway developed to Interstate System standards. U.S. Highway 20/26 would be crossed approximately 5 miles east of the town of Powder River, and then crossed again 3 miles east of Natrona. U.S. Highway 20/26 connects west to Shoshoni, Riverton, and Thermopolis and east to Casper. U.S. Highway 20/26 is a paved, two-lane, primary highway. State highways that would be crossed by the Project are WY 192 and 59. WY 192 is a paved, two-lane, secondary highway connecting Kaycee at I-25 with WY 387 northeast of Edgerton. WY 59 is a paved, two-lane highway originating in Douglas, passing north through Gillette, and terminating in Montana. **Table 3-22** lists traffic levels on the major highways.

Table 3-22 Traffic Levels for Major Highways Crossed by the Greencore Project, 2008

Highway	Location	2008 Traffic Counts			
		AADT[1]		Total Annual[2]	
		Total Traffic	Trucks	Total Traffic	Trucks
U.S. Highway 20/26	Between Powder River and Natrona, near Powder River Road (MP 33.1)	2,560	480	934,400	175,200
I-25	Near Exit 235 (MP 86.4)	1,540	380	562,100	138,700
WY 192	Near Sussex (MP 107.0)	160	30	58,400	10,950
I-90	Near Exit 102 (MP 148.8)	2,050	440	748,250	160,600
U.S. Highway 14/16	North of Road 23 (MP 178.9)	1,620	230	591,300	83,950
WY 59	North of Weston (MP 201.2)	470	90	171,550	32,850

[1] Annual Average Daily Traffic.

[2] Extrapolated from AADT.

Source: Wyoming Department of Transportation (2008).

Areas between the major highways are served by an irregular, complex network of unpaved roads ranging from unmaintained 4-wheel drive trails to gravel-surfaced county roads. In certain energy development areas, the networks are fairly dense, having been constructed for resource development purposes. Notable access points include Thirty-three Mile Road (MP 64), Sussex Field Road (MP 100.5), Buffalo Cut across Road (MP 143.5), Trail Creek Road (MP 218), and Ranch Creek Road (MP 226).

The Project has rail service via the Burlington Northern Railroad, which passes through the cities of Casper and Gillette.

3.14 Cultural Resources/Native American Concerns

3.14.1 Cultural Resources

Federal historic preservation laws provide a legal environment for documentation, evaluation, and protection of cultural resources that may be affected by federal undertakings, or by private undertakings operating under federal license, or on federally-managed lands. NEPA states that federal undertakings shall take into consideration impacts to the natural environment with respect to an array of resources, and that alternatives to the proposed federal action must be considered. The courts have made clear that cultural resources are regarded as part of the natural environment. The NHPA of 1966, as amended, established the ACHP and the National Register of Historic Places (NRHP). The NHPA mandates that federal agencies consider an undertaking's effects on cultural resources that are listed or eligible for listing on the NRHP. Section 106 of the NHPA establishes a review process by which these resources are given consideration during the conduct of federal undertakings. Cultural resources that are listed or eligible for listing on the NRHP are referred to as historic properties.

A PA currently is being developed between the BLM and Wyoming and Montana SHPOs. A copy of the PA is provided in **Appendix B**. The PA outlines mitigation treatment plan requirements and procedures for mitigating potential impacts to identified and unidentified cultural resources. Protection measures identified in the PA include protective fencing between the ROW and selected sites, narrowing of the ROW at selected sites, OTI for evidence of buried cultural deposits, and treatment of unanticipated discoveries, including human remains.

3.14.2 Eligibility Criteria for Listing Cultural Resources on the NRHP

The NRHP, maintained by the National Park Service (NPS) on behalf of the Secretary of the Interior, is the nation's inventory of significant cultural resources. The NPS has established three main standards that a resource must meet to qualify for listing on the NRHP: age, integrity, and significance. To meet the age criteria, a resource generally must be at least 50 years old. To meet the integrity criteria, a resource must "possess integrity of location, design, setting, materials, workmanship, feeling, and association" (36 CFR 60.4). Finally, a resource must be significant according to one or more of the following criteria:

- Criterion A – Be associated with events that have made a significant contribution to the broad patterns of our history; or
- Criterion B – Be associated with the lives of persons significant in our history; or
- Criterion C – Embody the distinctive characteristics of a type, period, or method of construction or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D – Have yielded, or may be likely to yield, information important in prehistory or history.

3.14.3 Area of Potential Effect

For the Project, the analysis area for cultural resources includes the area of potential effect (APE). Under Section 106 of the NHPA, the APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking" (36 CFR 800.16[d]).

The APE should include the following:

- All alternative locations for all elements of the Project;
- All locations in which the Project might result in ground disturbance;
- All locations from which elements of the Project (e.g., a facility or land disturbance) might be visible;
- All locations in which the Project might change traffic patterns, land use, public access, etc.; and
- All areas in which direct or indirect effects might occur.

The APE for direct and indirect impacts encompasses the pipeline ROW, pipe and contractor yards, access roads requiring upgrade, ATWS, and ancillary facilities. Where applicable, the APE for visual impacts includes those ancillary facilities, or other elements of the Project, visible from historic properties in which setting contributes to their NRHP eligibility.

Cultural Resources Investigations

Class III field inventories currently are being conducted to locate and document cultural resources along the Project ROW, existing access roads requiring upgrades, ATWS, and ancillary facilities. Prior to the field inventories, a files search was completed through the Wyoming and Montana SHPOs to identify all previously conducted archaeological investigations and previously recorded cultural resources within 0.5 mile on either side of the Project centerline, along existing access roads requiring upgrade, and within the footprint of ATWS and ancillary facilities. General Land Office (GLO) maps also were reviewed to assist in the identification of historic resources (e.g., roads, trails). As a result of the files search and map review, a total of 919 sites were identified within the files search study area. The majority of these previously documented sites are prehistoric camps and prehistoric lithic scatters, followed by historic debris scatters and multi-component sites containing both prehistoric and historic components.

The Class III field inventory of the Project ROW is being conducted within a 200-foot-wide survey corridor. Approximately 210 miles (91 percent) of the ROW is collocated with existing utility corridors. Where the ROW is collocated with an existing utility corridor, the 200-foot-wide survey corridor extends 50 feet from the existing utility centerline to the Project centerline, and 150 feet from the Project centerline on the other side. Where the ROW is not collocated with an existing utility corridor, the survey corridor is 200 feet wide centered on the Project centerline. The Project would be restricted to a nominal 150-foot-wide construction ROW. A 100-foot-wide corridor is being inventoried for access roads requiring upgrade. Inventory of two probable future Natrona Hub locations included a 10-acre area.

At this time, Class III inventories have been completed for approximately 230.4 miles of the 231-mile-long pipeline ROW, all currently identified access roads and ATWS, and six ancillary facilities, including two future Natrona Hub locations, midpoint, endpoint, Upton pipeyard, and Casper pipeyard. Any remaining unsurveyed pipeline ROW, ATWS, access roads, and ancillary facilities would be surveyed prior to the Project construction and with enough lead time to allow for evaluation of sites located during the inventories, assessment of impacts, and mitigation, if necessary.

To date, a total of 123 sites and 76 isolated finds have been recorded within the Project and access road survey corridors and ancillary facilities. The isolated finds include 70 prehistoric, 5 historic, and 1 multi-component isolates. Of the 123 sites, 69 are prehistoric, 44 are historic, and 10 are multi-component. In sum, 21 of the sites are recommended or currently determined as eligible for the NRHP and 102 are not eligible (**Table 3-23**). The Project crosses 12 NRHP-eligible linear resources, 2 of which are contributing segments. The types of NRHP-eligible sites located in the Project APE and their management recommendations are listed in **Table 3-24**. It should be noted that three prehistoric sites (48JO938, 48NA1431, 48NA4073) recommended or currently determined as eligible for the NRHP are located outside of, but close to, the Project APE. As such, pre-construction fencing is recommended to ensure protection of these sites.

Table 3-23 Summary of Site Types and Eligibility

Site Type	Eligible	Not Eligible	Total
Prehistoric	7	62	69
Historic	13	31	44
Multi-component	1	9	10
Total	**21**	**102**	**123**

Source: Metcalf 2010.

Table 3-24 NRHP-Eligible Sites Located Within the Project APE

Site Number	Site Type	Project Element	Management Recommendation
48CA265	Historic Railroad	ROW	Non-contributing/NFW
48CA1473	Historic Texas Trail	ROW	Non-contributing/No physical trace/NFW
48CA2785	Historic Black and Yellow Road; State Highway 14/16 route	ROW	Non-contributing/NFW
48JO134	Historic Bozeman Trail – route from Fort Fetterman	ROW, access road	Contributing/No adverse effects (no physical evidence of the trail)/NFW

Table 3-24 NRHP-Eligible Sites Located Within the Project APE

Site Number	Site Type	Project Element	Management Recommendation
48JO1599	Historic Bozeman Trail – route from Deer Creek Station and Richards Bridge	ROW	Non-contributing/Revisit in spring 2011 to confirm no physical trace; if trace is visible, conduct pre-construction recordation/Restrict and fence ROW/Post-construction restoration
48JO3059	Historic Fort Fetterman to Fort McKinney Telegraph Line	ROW, access road	Non-contributing/Presumed destroyed/NFW
48NA242	Historic North South Railroad	Access road	Contributing/Access road would be restricted to light-duty trucks/NFW
48NA631	Historic Chicago and Northwest Railroad – Sodium, Wyoming, crossing	ROW, access road	Non-contributing/NFW
48NA631	Historic Chicago and Northwest Railroad – Powder River, Wyoming, crossing	ROW	Non-contributing/Narrow and fence ROW
48NA1014	Prehistoric open camp/historic debris scatter	ROW, access road	Non-contributing/Fence south side of access through site
48NA1035	Prehistoric open camp	ROW	Non-contributing/NFW
48NA1425	Prehistoric open camp	ROW	Avoid or data recovery
48NA1428	Prehistoric open camp	ROW	Non-contributing area/NFW
48NA1800	Prehistoric open camp	ROW	Currently listed as eligible for the NRHP; re-evaluated as not eligible/NFW
48NA1968	Prehistoric open camp	ROW	Non-contributing/NFW
48NA1975	Historic Yellowstone Highway 20 – Hells Half Acre Crossing	ROW	Non-contributing/NFW
48NA1975	Historic Yellowstone Highway 20 – Sodium, Wyoming, crossing	ROW	Non-contributing/NFW
48NA2561	Historic Chicago, Burlington & Quincy Railroad – Arminto, Wyoming, crossing	ROW, access road	Non-contributing/NFW
48NA2561	Historic Chicago, Burlington & Quincy Railroad – Sodium, Wyoming, crossing	ROW, access road	Non-contributing/NFW
48NA4837	Prehistoric stone circles	ROW	Non-contributing/Features avoided/Restrict and fence ROW
48NA4838	Prehistoric open camp	ROW	Avoid or data recovery

NFW = No Further Work.

Source: Metcalf 2010.

Avoidance is recommended for two of the NRHP-eligible prehistoric open camps (48NA1425, 48NA4838). If avoidance is not feasible, data recovery (i.e., archaeological excavation) would be conducted at the sites to mitigate impacts associated with the Project construction. Currently, a historic properties treatment plan is being prepared in the event the two sites cannot be avoided by the Project construction.

3.14.4 Native American Concerns

Native American traditional, religious, and cultural concerns include archaeological sites and areas and materials important to Native Americans for religious and/or traditional use. Sensitive resources could include prehistoric sites, features (e.g., stone circles/cairns), artifacts, contemporary sacred areas, burial sites, traditional use areas, and sources for materials used in the production of sacred objects and traditional tools. In 1992, the NHPA was amended to explicitly allow that "properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization may be determined to be eligible for inclusion on the NRHP." To date, two prehistoric stone circles and two prehistoric cairns have been documented during the Class III inventory.

It is the responsibility of all federal agencies to comply with the requirements of Section 106 and the ACHP's regulations when planning and carrying out their undertakings. In doing so, they are required to consult with Native American groups or other interested parties depending on the specifics of the undertaking. Such consultation with Native American groups or other interested parties is central to the Section 106 process. Consultation is defined in the ACHP's regulations as "the process of seeking, discussing, and considering the views of other participants, and, where feasible, seeking agreement with them regarding matters arising in the Section 106 process" [36 CFR § 800.16(f)].

As part of the Section 106 compliance process, a certified/registered letter was sent to all federally recognized Native American groups either residing in or with cultural ties to the Project area. The letter informed these groups of the proposed undertaking and solicited their concern/comments regarding possible historical and traditional ties to the area or the presence of sites of cultural and religious importance. A total of six applicable Native American groups were contacted: Northern Cheyenne, Blackfeet, Crow, Eastern Shoshone, Northern Arapaho, and Ute. In addition, the tribes were informed of the ongoing archaeological surveys and current number of NRHP-eligible prehistoric sites located during surveys. A field visit to site 48NA905, a NRHP-eligible site consisting of stone circles, a stone cairn, historic dugout, and water well, was organized by the BLM. Of the six tribes, only the Crow participated in the field visit. Subsequent to the field visit, the Project ROW was rerouted to avoid the site.

Any specific information provided by tribal members concerning Native American traditional use and/or sites of cultural and religious importance in or near the Project area would remain confidential. At this time, consultation with the Native American groups is ongoing and would continue up to and including the Project construction.