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BLACK HILLS POWER

Teckla-Osage-Rapid City 230 kV Transmission Line *Routing Report*

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117390

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Routing Report

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REVISION HISTORY		
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1.0 INTRODUCTION

This report describes the methodologies and associated assumptions that were used to conduct this siting study for the proposed Teckla-Osage-Rapid City 230 kV Transmission Line Project (Project). The methods used for this siting study included collection and review of existing data, largely from the Black Hills and Medicine Bow-Routt National Forests and from South Dakota and Wyoming resource and land management agencies.

Data was collected pertaining to land use, visual resources, cultural resources, biological resources and water resources. Data collection was followed by sensitivity analysis and mapping using criteria established by the planning team. Available geographic information system (GIS) coverages with associated metadata were assembled and reviewed, relevant data was selected and mapped, and sensitive areas that would influence the location of feasible corridors were identified.

The study approach included six major tasks:

- Base Map Refinement
- Study Area Definition
- Data Collection and Mapping
- Sensitivity Criteria and Analysis
- Opportunities and Constraints Evaluation
- Corridor Identification

2.0 BACKGROUND

Black Hills Power (BHP) proposes construction of one 230 kV transmission line from Teckla Substation to Osage Substation in Wyoming, then on to Lange Substation located at Rapid City, South Dakota. The line will be about 150 miles long running from northeastern Wyoming to the Rapid City area in South Dakota. This transmission line's purpose will be to strengthen the integrated transmission network, improve transmission system reliability by creating additional operating flexibility, and to help meet future demand growth for electricity and economic development in the region.

POWER Engineers was retained by BHP to conduct this routing study. The intent of this study is to identify reasonable alternative corridors that could accommodate the routing of a transmission line. A total of 25 alternative corridors were identified, with a total of 6 recommended to be carried forward to further analysis.

When the routing process for the Project began in the fall/winter of 2009, routing considered the stipulations and guidelines of Wyoming Governor Dave Freudenthal's Executive Order 2008-2 – Greater Sage-grouse Core Area Protections. This Executive Order divided the state of Wyoming into greater sage-grouse core areas where restrictions are placed on development. Under Executive Order 2008-2, three portions of core area within the Project Area (Moorcroft, SE of Gillette, and East Clareton) were separate and not connected. Initial routing efforts designed corridors to pass between these sections of core area, or cross core areas paralleling existing travel corridors. Thus, two of the three initial alternative corridors in Wyoming did not pass through any greater sage-grouse core areas. One of the three initial alternative corridors crossed approximately 16.4 miles of core area but it did so adjacent to a state highway.

On August 18, 2010, Wyoming Governor Dave Freudenthal released Executive Order 2010-4, an updated version of the Great Sage-grouse Core Area Protection which replaced Executive Order 2008-2. Under Executive Order 2010-4, the core areas of Moorcroft, SE of Gillette, and East Clareton were connected to conserve habitat for birds passing between these populations. As a result of Executive Order 2010-4, the Project would have to route north approximately 30 miles to near Gillette and Interstate 90, or south approximately 30 miles to avoid core areas.

Through consultation with the Wyoming Governor's Office, Wyoming Game and Fish Department (WYGF), and the U.S. Fish and Wildlife Service (USFWS), a potential corridor passing through the core area where existing energy and agricultural development predominates and where the core area is at its narrowest (approximately four miles) was identified, dependent on the Project developing a suitable Greater Sage-Grouse Development and Mitigation Plan for those four miles. A Development and Mitigation Plan will be developed because the proposed corridor will not fall within the stipulations for constructing a transmission line set forth in Executive Order 2010-4. These consultations included a site visit to the area of the proposed corridor to note existing disturbance and the alignment of the proposed corridor.

The proposed four mile corridor through the core area passes in close proximity to Raven Creek Road to the west of State Highway 116, and will parallel Raven Creek Road for approximately one mile. Existing disturbance in the form of agricultural hay fields, single phase and three phase distribution lines, houses and associated out-buildings, roads, wind-mills, and oil wells is currently in close proximity to the proposed corridor.

The proposed corridor would enter the core area in Township 45 North, Range 67 West, Section 16 on land owned by the state of Wyoming at the core areas narrowest point. The proposed corridor would then angle south-east to parallel a three phase distribution line before heading straight east along the southern section lines of sections 15, 14, 13, and Township 45 North, Range 66 West, Section 18 to where it leaves the core area.

The closest greater sage-grouse lek is the Popham Lek, located approximately two miles to the north of the proposed corridor. Topography hides the visibility of the proposed corridor centerline from the Popham Lek for the majority of the four miles of core area. In addition, existing disturbance which occurs between the proposed corridor and the Popham Lek include single and three phase distribution lines, Raven Creek Road, houses and associated out-buildings, agricultural hay fields, and wind-mills.

3.0 AGENCY COORDINATION

POWER Engineers, Inc and BHP conducted meetings with state and federal agencies that have interest and/or relevant environmental data on the study area for the Project. The agencies contacted included: United States Fish and Wildlife Services (USFWS), Wyoming Game and Fish (WYGF), Black Hills National Forest (BHNF), the Bureau of Land Management (BLM), Medicine Bow – Routt National Forest (MBRNF), Thunder Basin National Grasslands (TBNG), Wyoming Public Service Commission (WYPSC) and South Dakota Public Utilities Commission (SDPUC). The complete Agency Coordination Report is included as Appendix A.

4.0 PUBLIC INVOLVEMENT

An initial public involvement process was conducted that integrated public comment and participation with the Project's transmission line siting study.

The Project Team utilized the public's participation, generally considered a consultation role, to provide information concerning potential line routes, and provide feedback on decisions made in the initial route development process. A consultation role, as defined by the International Association for Public Participation, can be described as one in which the public is informed, shares concerns and provides feedback regarding the process itself but is not engaged in a decision-making capacity. These considerations include, but are not limited to, how decisions were made and how route evaluations were conducted within the process.

Additionally, in the consultation capacity, audiences were informed how their feedback would be utilized within the route-development process. An overview of the public involvement process for the Project is provided below.

The public involvement process was used to inform local officials, land owners, the public at large, and other interested parties about the project. The public involvement program included three distinct activities. These activities were:

- Local Elected Official Notifications
- Key Stakeholder Meetings
- Public Meetings – Open House Format

The local elected official notifications involved identification of the appropriate elected officials and project packet mailings. The purpose of these notifications was to share information and get feedback on the project.

Key stakeholder meetings were held with three coal companies in Wyoming and a large industrial property owner near Rapid City, South Dakota. The purpose of these meetings was to share information about the project and gather land use information and other pertinent details from these companies.

The public open house meetings were held in Newcastle, Wyoming and Rapid City, South Dakota. The purpose of the meetings was to disseminate project information and gather feedback from landowners and other interested parties regarding the project. The Public Involvement Process Report is included in Appendix B.

5.0 BASE MAP

A project base map was prepared at a scale of 1:316,800 (1 inch = 5 miles). The 1:316,800 scale base map is a single sheet and was used to initially display resource data for the entire project area. Data categories and factors that were determined to be appropriate for sensitivity analysis were selected. Data displayed on the base map included: major federal and state land jurisdiction and private ownership, major roads and highways, existing and proposed railroads, active mines, transmission lines, major political subdivision boundaries, state and national parks as well as lakes, reservoirs, rivers and ponds all overlayed on a topographic hill-shade. This map scale was used to display various resource sensitivities, composite constraints and opportunities and ultimately the alternative route corridors to provide the big picture of the study area.

6.0 STUDY AREA

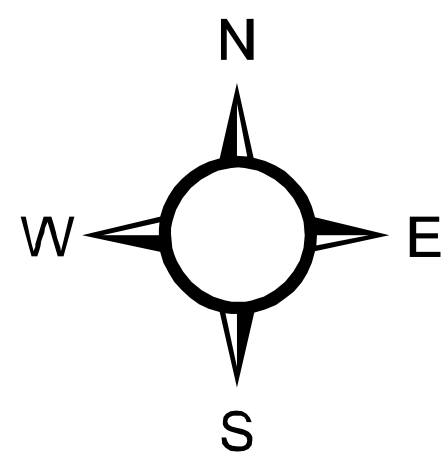
The Project study area was defined so that a range of reasonable and feasible alternatives for the location of a 230 kV transmission line could be identified. Major physiographic features, jurisdictional boundaries, sensitive land uses, sensitive environmental areas such as known greater sage-grouse leks and greater sage-grouse core habitat areas and existing transportation and utility corridors helped to define the study area boundaries. The study area was defined to be large enough to establish a range of reasonable and feasible transmission line alternatives for the Project while maintaining a manageable size for the collection and meaningful analysis of information. The extent of the study area is described below and illustrated in Figure 1, Project Area Base Map. The size of the study area is approximately 3,465 square miles.

The eastern portion of the study is defined by the project terminus at the existing Lange Substation, at Rapid City, South Dakota.

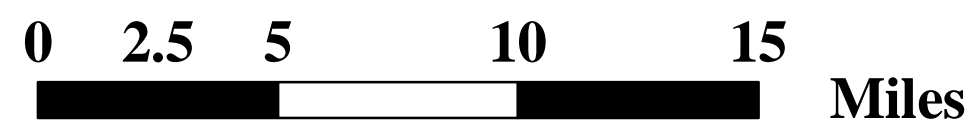
In South Dakota, southern and northern boundaries were established to include several existing substations, existing transmission lines, an abandoned 69 kV line right of way, as well as excluding Custer State Park to the south.

The western portion of the study area is defined by the western terminus of the project located at the existing Teckla Substation and Highway 59, south of Gillette, Wyoming.

In Wyoming, southern and northern boundaries were defined to include enough space to allow avoidance or minimization of greater sage-grouse core habitat areas, active or planned mining operations, sensitive areas identified by the Forest Service in its Forest Plan for the TBNG and the inclusion of existing transportation and transmission line corridors including an abandoned 69 kV transmission line corridor. An intermediate interconnection point for the proposed transmission line exists at the existing Osage Substation located southwest of Newcastle, Wyoming.



Scale 1:253,440
1 inch = 4 Miles



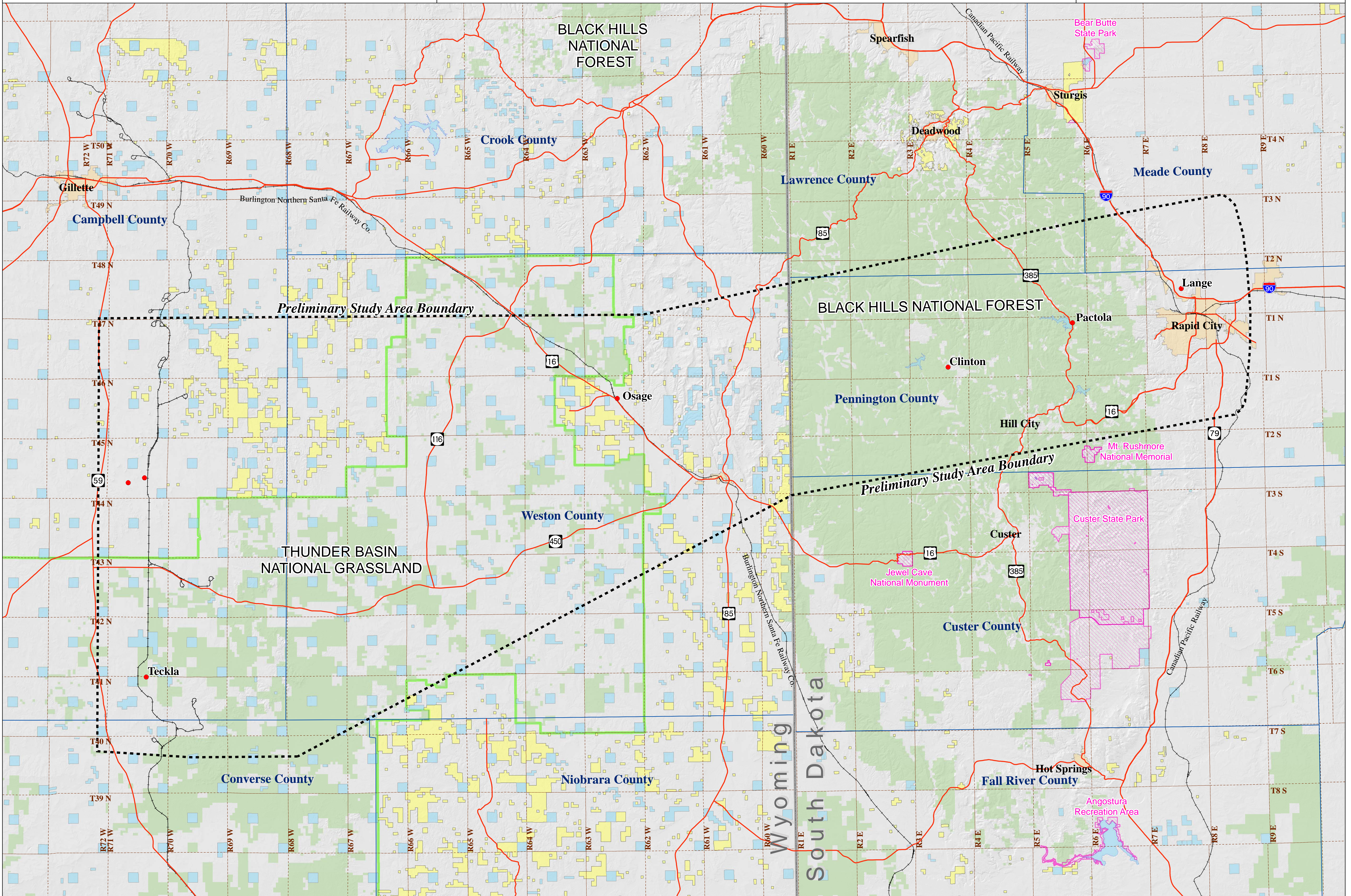
Black Hills Power Teckla-Osage-Rapid City 230kV Transmission Line Project Project Area Base Map



Project: R:\117390BIHills\App\ResourceMaps\StAreaBasemap

Figure 1

Date Printed: 1/27/2011



Legend

Project Components

- Substation
- Project Study Area

Jurisdiction

- Bureau of Land Management
- Forest Service
- Private
- State Land

- Thunder Basin National Grasslands
- State or National Park

Transportation Features

- Interstate or Major Highway
- Railroad

Administrative Boundaries

- City Boundary
- County Boundary
- State Boundary

7.0 DATA COLLECTION

Resource data covering the study area was obtained from a variety of sources. Sources included published and unpublished literature, documents, reports, studies, maps, Forest Service Plans, and BLM Resource Management Plans. Available GIS coverages were obtained from the Forest Service, BLM and other federal agencies such as the USFWS and South Dakota and Wyoming state agencies and other national and state data bases.

Meetings were held with the BHNF and TBNG personnel to gather pertinent data and information, and to seek agency guidance on avoidance areas and areas of agency preference for the siting of a new transmission line corridor. Inventory data were collected for five primary resource areas that included land use, visual resources, cultural resources, biological resources and water resources. Resource data were then mapped utilizing GIS. Field observations were conducted by project resource specialists to verify or augment the existing data.

Once inventory mapping was completed, the maps were used for the purposes of conducting sensitivity analysis, identifying opportunities and constraints and identifying feasible alternative corridors. The following provides information on the inventory methodologies by resource area.

7.1 Land Use

Land use data collection methods included searching federal, state, and local government websites to obtain available plans, policies, and regulations. For Weston County, Wyoming, relevant information was not available online. Project staff then contacted the Weston County Planning and Zoning Director to obtain land use planning information.

The project area generally extends between Teckla Substation near Wright, Wyoming and Rapid City, South Dakota, and includes land under federal, state, and local government jurisdiction, as well as land held in private ownership. The following discussions present the regulatory setting, which includes each jurisdiction's plans, policies, and regulations that govern land use in the project area, and the methods used to collect land use information. Subsequent sections of this report present a sensitivity analysis, which, based on the foregoing plans, policies, and regulations, identifies areas that should be excluded from consideration in routing the proposed 230 kV transmission line, as well as areas that exhibit high, moderate, and low sensitivity for routing. In general, the lower an area's sensitivity, the more suitable it might be for routing the proposed transmission line. A final discussion summarizes land use concerns in the project area. Figure 2 depicts land ownership and jurisdiction boundaries in the project area.

7.1.1 Regulatory Setting

7.1.1.1 Federal Government Plans, Policies and Regulations

Federal government land in the project area includes BHNF, TBNG, and BLM land.

Black Hills National Forest

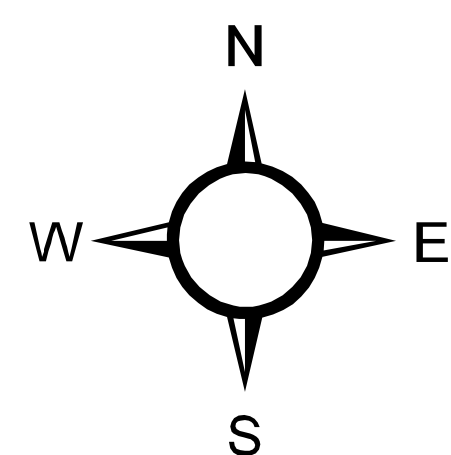
The 1.2 million-acre BHNF extends over portions of Custer, Fall River, Lawrence, Meade, and Pennington counties in South Dakota, and portions of Crook and Weston counties in Wyoming.

BHNF covers the majority of the project area in South Dakota and includes pockets of private land. The United States Forest Service (USFS), a division of the United States Department of Agriculture (USDA), manages BHNF. The principal laws that regulate land use in BHNF include the National Forest Management Act of 1976 (NFMA), the Multiple-Use Sustained-Yield Act of 1960, and the National Environmental Policy Act of 1969 (NEPA). Per the NFMA, the USDA Secretary must prepare a renewable resource assessment to include a comprehensive inventory of all National Forest System lands and renewable resources. The NFMA also requires the USDA Secretary to develop a renewable resource program to conform to principles contained in the Multiple-Use Sustained-Yield Act and NEPA. These two acts, respectively, guide timber sales in national forests and analyze anticipated environmental impacts of projects that receive federal funding and/or require federal permits or approval.

Additionally, the USDA Secretary must implement a resource management plan and update the plan at least once every 15 years. The following discusses BHNF's current land and resource management plan (LRMP) and the transportation network in the BHNF portion of the project area.

Land and Resource Management Plan

The USFS manages BHNF in accordance with its 1997 Revised LRMP, which it amended in 2005. In general, the LRMP provides a programmatic management strategy that covers the entire BHNF over a course of 10 to 15 years. The LRMP "provides guidance for all resource management activities on the Black Hills National Forest" (USFS, 1997). The LRMP presents USFS goals and objectives for BHNF. Goals are concise statements about future desired conditions. Objectives include specific actions that can be measured over a period of time to achieve the goals. The LRMP also presents Forest-wide standards and guidelines. Standards are requirements that shall be met, whereas guidelines include activities that should be followed. Additionally, the LRMP includes policies for BHNF's 20 management areas. The project area includes eight BHNF management areas, of which the Black Hills Experimental Forest, Late Successional Forest Landscape, Limited Motorized Use and Forest Product, and Resource Production Emphasis are the most relevant to land use planning for this project. For purposes of routing the proposed transmission line, the following discussions present the LRMP's goals and objectives, standards and guidelines, and management area policies relative to land use, as well as stipulations for oil and gas exploration and production in BHNF.



Scale 1:249,000

0 2.5 5 10 15 Miles

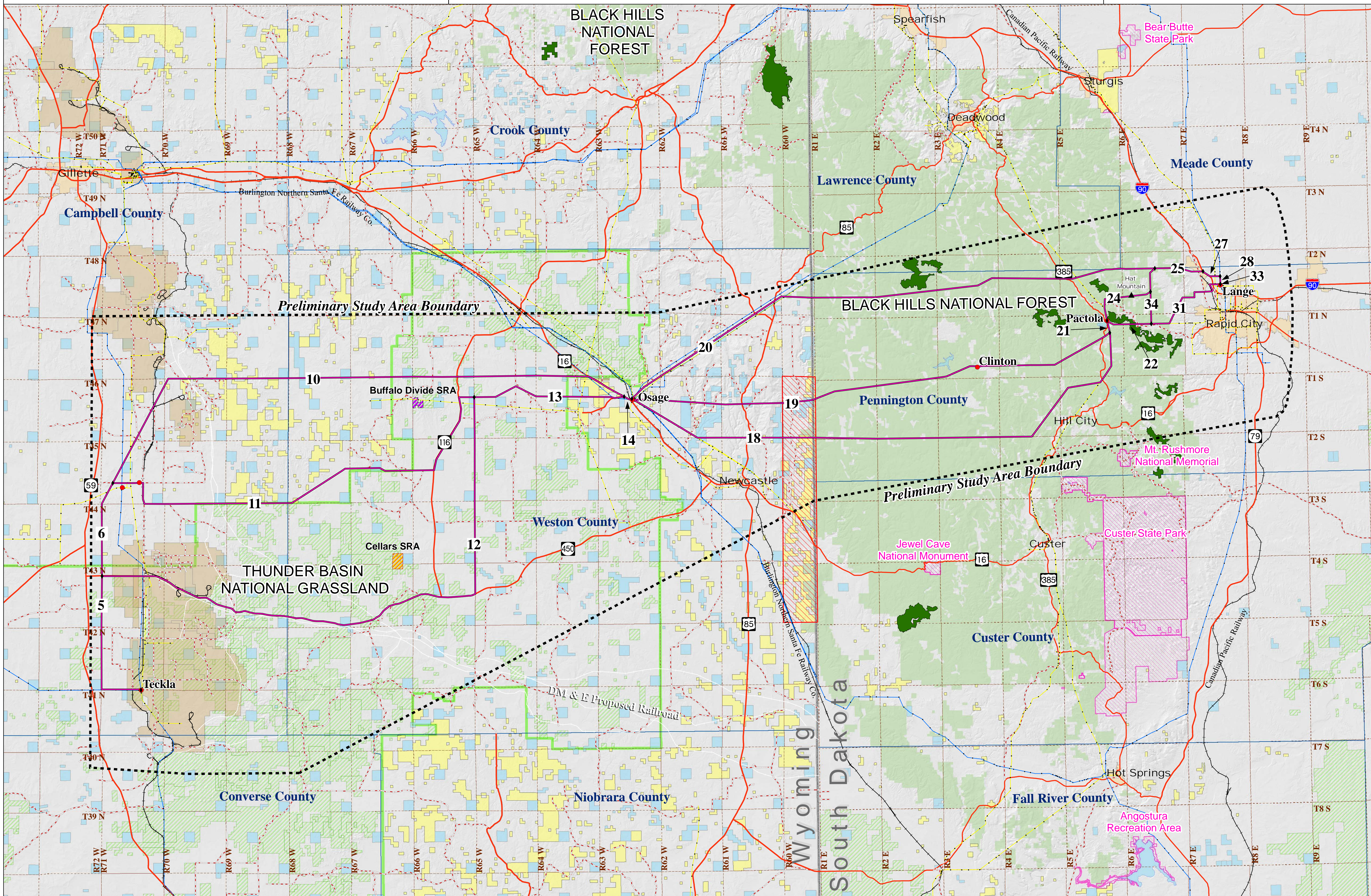
Black Hills Power Teckla-Osage-Rapid City 230kV Transmission Line Project Project Area Land Use



Project: R:\117390_\App\ResourceMaps\Report\LandUse

Figure 2

Date Printed: 2/2/2011



Legend

Project Components

- Node Separating Links
- Proposed Route Link
- Project Study Area

Land Use

- BLM Stateline Special Rec. Mgt. Area
- Late Successional Forest Landscape
- Mine Permit Area
- Boundary or Pending Lease Application

Jurisdiction

- Bureau of Land Management
- Forest Service
- Private
- State Land
- State/National Park

- Thunder Basin National Grasslands
- Grasslands

Special Interest Areas

- Buffalo Divide SIA
- Cellars SIA

Utility Features

- Existing Substation
- ≤69kV Transmission Line
- 230kV Transmission Line

Transportation Features

- Interstate/Major Highway
- Secondary Road
- Railroad
- DM & E Proposed Railroad

Administrative Boundaries

- City Boundary
- County Boundary
- State Boundary

Goals and Objectives

LRMP Goal 3 seeks to provide for sustained commodity uses in an environmentally acceptable manner. One objective to achieve this goal includes managing ecosystems to help benefit commercial activities.

LRMP Goal 5 seeks to cooperate with landowners to improve land ownership and access that benefits both public and private landowners. In general, the USFS seeks to acquire lands that feature critical ecosystems, threatened and endangered species, and outstanding scenic areas, as well as lands within designated wilderness. The USFS seeks to convey lands that have lost their National Forest character, have been substantially developed, and are near expanding communities. Objectives to achieve this goal include conducting land exchanges each year over the decade, whenever lands meet the real estate criteria below; acquiring rights-of-way; seeking local and tribal government input on land exchanges; and working with conservation groups and state agencies to protect lands.

LRMP Goal 8 seeks to promote rural development opportunities. The USFS seeks to provide information and forecasts on future trends and events for local planning efforts. Such information and forecasts can help rural communities diversify and stabilize their economies. Objectives to achieve this goal include working with local, state, and tribal partners to promote sustainable development; and helping to diversify and stabilize rural economies, which depend on National Forest activities.

Standards and Guidelines

The LRMP includes standards and guidelines for corridors, real estate, and rights-of-way. Corridor standards authorize projects that use existing utility corridors, subject to site-specific environmental review, but do not authorize conflicting uses or activities within utility corridors. Corridor guidelines seek to consolidate transportation and utility corridors wherever possible, and ensure that management activities in linear corridors are compatible with the goals of the individual management areas through which the corridors pass (USFS, 1997).

Real estate guidelines reflect the objectives in Goal 5 above. The guidelines encourage acquiring lands that can add value to the National Forest System, and are needed to meet resource management goals and objectives. The guidelines also encourage conveying lands that serve a greater public interest.

The most relevant right-of-way standard retains existing access rights where needed to meet the LRMP's goals and objectives.

Management Area Policies

The USFS manages BHNF in accordance with the NFMA. To this end, the USFS preserves the Black Hills Experimental Forest for its Rocky Mountain Research Station. This management area features many roads, and off-road motorized travel is allowed unless restricted by a specific project description. The USFS will not issue new special use permits in this management area. In the Late Successional Forest Landscape area, the USFS limits construction of new roads and does not seek to permit transmission corridors that might alter significant areas of vegetation. In the Limited Motorized Use and Forest Product Emphasis area, the USFS promotes non-motorized recreation, timber and forage production, visual quality, and wildlife. Existing roads in this area are used to

provide access to commercial activities, including timber production, and are generally closed unless opened for management or logging. Finally, the USFS manages the Resource Production Emphasis area for wood products, water yield, and forage production. Many open roads in this area are used for commercial purposes. Off-road motorized travel and motorized road travel are allowed unless restricted by a specific project description.

Oil and Gas Exploration and Production

The LRMP for BHNH includes stipulations for leasing property for oil and gas exploration and production. The stipulations include three categories – controlled surface use (CSU), no surface occupancy (NSO), and Timing Limitations. CSU stipulations allow a leaseholder to use and occupy land, if not restricted by another stipulation. However, where resource values are identified, such values require operational constraints that might alter the leaseholder's rights (USFS, 1997). Activities and management objectives requiring the CSU stipulation in the lease include, but are not limited to:

- Areas of known significant cave locations;
- Areas visible to the visiting public;
- Riparian areas; and
- Visual Resource Management Condition Classes II, III, and IV.

To protect identified resource values, NSO prohibits a leaseholder from using or occupying the land surface. Activities and management objectives requiring the NSO stipulation in the lease include, but are not limited to:

- Areas designated for historic sites, non-motorized use, and for significant cave locations and scenic landscapes;
- Areas that feature slopes greater than 40 percent;
- Cultural sites;
- Developed recreation areas;
- Raptor nests;
- Reservoirs; and
- Riparian areas.

Timing Limitations prohibit leaseholders from using the land surface during specified time periods. Activities and management objectives requiring the Timing Limitations stipulation in the lease include, but are not limited to:

- Areas of high recreation activity and seasonal public use;
- Grouse nesting zones;
- Raptor nests;
- Spring elk calving ranges; and
- Wildlife winter ranges.

In addition to these stipulations, a floodplain and wetland lease notice will be included in leases for lands that contain floodplains and/or wetlands pursuant to Executive Order (EO) 11988, *Floodplain Management* and EO 11990, *Protection of Wetlands*.

Special Administration Stipulations are used in situations where the three uniform stipulations above, or lease notices, do not adequately address the concern. An example includes the Stipulation for Lands of the National Forest System under Jurisdiction of Department of Agriculture (Rocky Mountain Regional Coordinating Committee, 1989).

Transportation Network

The transportation network in the BHNF portion of the project area includes U.S. Routes 16 and 385, secondary roads, and a recreational trail. U.S. Route 16 extends in an east-west direction for approximately 15 miles. U.S. Route 385 extends in a north-south direction for approximately 30 miles. Secondary roads extend in an east-west direction for approximately 15 miles near Pactola, and along the project area's south-central boundary in BHNF. The recreational trail meanders for approximately 70-80 miles, primarily through BHNF's central and eastern portions in the project area. Though they are outside of the BHNF portion of the project area, Interstate 90 and the Canadian Pacific Railroad parallel each other in a northwest-southeast direction for approximately 20 miles between Rapid City and the Lawrence-Meade county border. To access construction sites for the proposed transmission line, the USFS suggests using existing roads as much as possible. The USFS would prefer to re-open a closed road, rather than construct a new one.

Thunder Basin National Grassland

TBNG, a sub-area of the Medicine Bow -Routt National Forest, covers approximately 553,000 acres, which extend over portions of Campbell, Converse, Crook, Niobrara, and Weston counties in Wyoming. TBNG covers the majority of the project area in Wyoming and includes a mix of federal, state, tribal, and private land. The USFS' Douglas Ranger District manages TBNG in accordance with the regulations mentioned above for BHNF. The following discussions present TBNG's current LRMP and the transportation network in the TBNG portion of the project area.

Land and Resource Management Plan

The USFS manages TBNG per its 2002 Revised LRMP, which includes goals, objectives, standards, and guidelines for managing resources. The same definitions for goals, objectives, standards, and guidelines apply to TBNG as for BHNF. Additionally, the LRMP includes policies for TBNG's six geographic areas. The project area includes five of the six areas – Broken Hills, Cellers Rosecrans, Fairview Clareton, Hilight Bill, and Upton Osage. For purposes of routing the proposed transmission line, the following discussions present the LRMP's goals and objectives, standards and guidelines, and geographic area policies relative to land use, as well as stipulations for oil and gas exploration and production in TBNG.

Goals and Objectives

LRMP Goal 4b seeks to provide appropriate access to National Forest System lands and USFS programs. Objectives to achieve this goal include developing and implementing land adjustment plans to respond to resource management and public needs, and acquiring rights-of-way to respond to resource management and access needs.

Standards and Guidelines

The LRMP includes standards and guidelines for land ownership, special uses, and infrastructure use and management. Land ownership standards require honoring existing treaties, mineral and water rights, and access to private property, as well as acquiring rights-of-way for public access. Land ownership guidelines encourage acquiring lands that can expand and add value to TBNG's natural and cultural resources, and disposing of lands that are no longer needed or are suitable for development.

Concerning special uses standards and guidelines, standards require that new power line design and construction include an 80-inch distance between conductors and ground wires to minimize raptor electrocution risks. Special uses guidelines permit utility companies to construct new utility corridors, unless prohibited elsewhere in the LRMP (USFS, 2002). Special uses guidelines encourage utility providers to consolidate lines wherever possible and seek to ensure that utility corridors are consistent between federal, state, tribal, and local government agencies. The guidelines also seek to minimize overhead power lines' visual impact. Additionally, the guidelines encourage USFS personnel to act on special-use applications that concern land use activities, including power lines.

Infrastructure use and management guidelines encourage USFS personnel to conduct site-specific roads analyses before making decisions to construct, reconstruct, or decommission a road, and not invest in new facilities on lands that meet disposal criteria.

Geographic Area Policies

The USFS manages TBNG in accordance with the NFMA. To this end, the USFS' desired condition in the Broken Hills area is one of open landscapes that reveal little activity or influence by humans. While oil and gas facilities will be present, the natural landscapes will dominate this area. Desired conditions in the Cellers Rosecrans area will feature a mix of grasses and coniferous and hardwood trees. The Fairview Clareton area will emphasize livestock grazing among land featuring rural and agricultural landscapes. Though oil and gas operations will dominate some landscapes, they will be less pronounced in other portions of this area. Similar livestock grazing and minerals development will exist in the Hilight Bill area. The Upton Osage area will generally mirror conditions in the Cellers Rosecrans area, with camping and picnicking opportunities.

Oil and Gas Exploration and Production

TBNG is situated among some of the richest deposits of coal, gas, and oil in the world. The Northern Wyoming coal industry produces more coal than any other location in the United States and is the world's third largest producer (USFS, 2002). A significant feature in TBNG is the Wyodak coal outcrop line, which meanders in a north-south direction through TBNG's eastern third. Pursuant to the 1994 Record of Decision (ROD) that prescribed stipulations, all of the lands in TBNG were available for oil and gas leasing. In 2002, the USFS issued a ROD that continued this availability, but modified the lease terms for lands east of the coal outcrop line. In 2006, the USFS issued another ROD, which changed the availability for specific lands west of the coal outcrop line. Oil and gas exploration and production activity is primarily concentrated around Wright, Wyoming. Per TBNG's LRMP, activities and management objectives requiring the CSU stipulation in the lease include, but are not limited to:

- Black-footed ferret habitat and reintroduction habitat;
- Dispersed recreation sites;
- High and moderate Scenic Integrity Objective areas;
- Mountain plover habitat;
- Paleontological resources;
- Special Interest Areas for zoological resources; and
- Wetlands, woody draws, riparian areas, and floodplains.

Activities and management objectives requiring the NSO stipulation in the lease include, but are not limited to:

- Backcountry, non-motorized recreation;
- Bald eagle nests and winter roosts;
- Display grounds for greater sage-grouse and sharp-tailed grouse;
- Golden eagle, merlin, ferruginous hawk, Swainson's hawk, and burrowing owl nests;
- Mountain plover nests and nesting areas;
- Research Natural Areas;
- Slopes between 25 and 40 percent, and slopes greater than 40 percent; and
- Special Interest Areas for archaeological, geological, and paleontological resources, and historic rangeland.

Activities and management objectives requiring the Timing Limitations stipulation in the lease include, but are not limited to:

- Big game range, including deer, elk, and pronghorn habitat;
- Black-footed ferret habitat;
- Display grounds for greater sage-grouse and sharp-tailed grouse;
- Elk calving;
- Ferruginous hawk and Swainson's Hawk nests;
- Golden eagle nests;
- Merlin nests;
- Mountain plover; and
- Swift fox dens.

Transportation Network

The transportation network in the TBNG portion of the project area includes U.S. Route 16, State Routes 116 and 450, secondary roads, a recreational trail, the Burlington Northern Sante Fe (BNSF) Railroad, and the proposed Dakota Minnesota and Eastern (DM&E) Railroad. U.S. Route 16 extends in a northwest-southeast direction for approximately 20 miles between Osage and Upton. State Route 116 extends in a north-south direction for approximately 40 miles as it bisects most of TBNG's central portion. State Route 450 extends in an east-west direction for approximately 90 miles along the center of TBNG. Secondary roads are scattered throughout the TBNG portion of the project area. A recreational trail extends for approximately 45 miles as it arcs through TBNG's eastern portion. In general, the BNSF Railroad parallels U.S. Route 16 between Osage and Upton. The proposed Dakota, Minnesota and Eastern (DM&E) Railroad branches throughout TBNG's western portion. To access construction sites for the proposed transmission line, the USFS suggests using existing roads as much

as possible. The USFS would prefer to re-open a closed road, rather than construct a new one. Additionally, the USFS would prefer that the proposed transmission line be routed along State Route 450, but realizes that the line might overcrowd existing uses along this route.

Bureau of Land Management

In general, BLM land is situated in the Wyoming portion of the project area. More specifically, BLM land is primarily situated in the project area's northwestern corner, along U.S. Route 16's west side near Osage, and along the Wyoming side of the Wyoming-South Dakota border. Smaller pockets of BLM land exist in a few other locations in the project area.

The BLM's mission is to "sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations" (BLM, 2001). To this end, the two principal laws that guide BLM land use planning activities include the Federal Land Policy and Management Act of 1976 and NEPA. The BLM, in accordance with the Federal Land Policy and Management Act, develops and implements resource management plans (RMPs) for the public lands and mineral resources within its jurisdiction.

For purposes of routing the proposed transmission line, the following discussions present the relevant land use planning policies contained in the RMPs prepared for the Buffalo, Casper, and Newcastle, Wyoming BLM field offices, and the South Dakota RMP. A subsequent discussion presents stipulations for oil and gas exploration and production on BLM land.

Buffalo, Wyoming RMP

The Buffalo BLM field office covers Campbell County, Wyoming in the project area. The Buffalo 2001 RMP encourages land exchanges as opposed to land sales. Land exchanges can help piece together parcels that, when assembled, allow the BLM to improve access to public land and manage the land more effectively. Concerning land acquisition and disposal, the Buffalo RMP's policy mirrors those mentioned above for BHNF and TBNG. The RMP's right-of-way policy is to grant access to serve public needs.

Casper, Wyoming RMP

The Casper BLM field office covers Converse County, Wyoming in the project area. The Casper 2007 RMP seeks to acquire, dispose of, use, and withdraw land in much the same manner as for the plans above. More specifically, the RMP's objectives include maximizing land disposal actions to "help solve problems related to intermixed land-ownership patterns" (BLM, 2007). The RMP also seeks to manage public lands to meet right-of-way needs, with specific attention to major right-of-way customers.

Newcastle, Wyoming RMP

The Newcastle BLM field office covers Weston County, Wyoming in the project area. The Newcastle 2000 RMP's land and realty management policies seek to locate utility lines adjacent to existing facilities whenever practical. Such facilities might require screening, painting, and/or a design that complements the surrounding landscape. Additionally, power lines should not be placed within one-quarter-mile of developed or semi-developed recreation sites. As with the Buffalo RMP, the

Newcastle RMP encourages land exchanges as opposed to other land adjustment methods. Concerning rights-of-way, the Newcastle RMP seeks to avoid “resource conflicts and sensitive areas” (BLM, 2000).

South Dakota RMP

Currently, the BLM is revising its South Dakota 1986 RMP. The 1986 document encourages acquiring lands that fit the same criteria as for the RMPs above and lands that would “consolidate the mineral estate” (BLM, 1986). Concerning rights-of-way, the South Dakota RMP states that while right-of-way widths for electric lines are being reduced to minimize surface disturbance, temporary use permits would authorize the additional width that might be necessary for construction activities.

Oil and Gas Exploration and Production

The Wyoming RMPs above encourage oil and gas leasing while maintaining the values of, and minimizing impacts to, other resources. The Reservoir Management Group manages oil and gas reservoirs throughout Wyoming. In general, a competitive bid process guides all public lands that are available for oil and gas leasing. Non-competitive leasing occurs after a parcel has been offered competitively, but failed to receive a bid. After public lands are leased, applications to conduct exploration, drilling, and production-related activities are reviewed to ensure technical competence, environmental protection, and mineral resources conservation. BLM is then responsible for approving and inspecting drilling and producing operations.

USFS Travel Management Plan

In 2005, the USFS issued its final Travel Management Rule, which requires any roads, trails, and areas open to motor vehicle use in the National Forest System to be officially designated. To comply with the Travel Management Rule, the USFS seeks to designate certain roads and trails as open to motorized travel in BHNH (USFS, 2009). In compliance with NEPA, the USFS developed a draft environmental impact statement (EIS) for its *Travel Management Plan* for BHNH. The EIS presents a range of alternative actions to manage motor vehicle travel in BHNH, including:

- Alternative A – continue existing conditions;
- Alternative B – allow public motorized vehicle travel on 4,129 miles of routes, and limit motorized, cross-country travel for game retrieval and dispersed camping on 179,000 acres;
- Alternative C – maximize motorized road and trail use to allow travel on 4,353 miles of routes, and limit motorized, cross-country travel for game retrieval and dispersed camping on 473,500 acres;
- Alternative D – allow motorized vehicle travel on 3,197 miles of routes and prohibit motorized, cross-country travel; and
- Alternative E – allow motorized vehicle travel on 3,776 miles of routes and prohibit motorized, cross-country travel.

The USFS selected Alternative B Modified as its preferred alternative. Alternative B Modified includes a variety of road and trail designations. More specifically, Alternative B Modified designates:

- 2,609 miles of roads open to highway-legal vehicles only. Operators must meet applicable State law for driver and vehicle licensing. Approximately 773 of the 2,609 miles will be seasonally restricted;
- 548 miles of roads open to all vehicles. Approximately 220 of the 548 miles will be seasonally restricted;
- 148 miles of trails open to all vehicles. Approximately 67 of the 148 miles will be seasonally restricted;
- 90 miles of trails open to motorcycles only. Approximately 38 of the 90 miles will be seasonally restricted;
- 72 miles of trails open to vehicles 50 inches or less in width, in Wyoming. Machines must have an authorization sticker from the state. All 72 miles will be seasonally restricted;
- 397 miles of trails open to vehicles 62 inches or less in width, in South Dakota. Machines do not need to be state highway-legal. Approximately 152 of the 397 miles will be seasonally restricted;
- 20 trailheads to serve the designated motorized system, including Reuter, Blacktail, Ditch Creek, Red Fern, Neck Yoke, Pine Grove, Shanks Quarry, Schroeder, Victoria, Thompson, Dutch Creek, China, Stageyard, Minnesota Ridge, Dalton Lake, Camp 5, Pilot Knob, Piedmont, South Boxelder, and Spearfish Quarry;
- 294,800 acres of access for motorized retrieval of elk only. Elk can be retrieved with a motorized vehicle within 300 feet of certain designated roads in South Dakota and Wyoming, and within one mile of certain designated roads in South Dakota; and
- 135,500 acres open to dispersed camping. Motor vehicle use for dispersed camping will be allowed within 300 feet of certain designated USFS roads where motor vehicle use is allowed. Dispersed camping is not permitted in or near developed recreation sites, or on adjacent lands of other ownership, such as the Mickelson Trail right-of-way.

7.1.1.2 State Government Plans, Policies, and Regulations

The following discussions present transportation and utility plans, policies, and regulations for South Dakota and Wyoming. Other than transportation and utility corridors, the project area does not include lands owned by the State of South Dakota. While the project area does include lands owned by the State of Wyoming. The state-owned lands in the Wyoming portion of the project area are generally in Sections 16 and 36 in all but a few townships.

South Dakota

Department of Transportation Plans

South Dakota's 2010-2014 Statewide Transportation Improvement Program (STIP) includes many roadway maintenance projects in Custer, Lawrence, Meade, and Pennington counties, portions of which are situated in the project area. For purposes of routing the proposed transmission line, perhaps the most important STIP project is programmed in Lawrence County along Nemo Road from U.S. Route 385 southeast to the Pennington County line. Though the work in this area is minor in nature, the project will cover 23 miles and begin in 2012. Other STIP projects include upgrading U.S. Route 16 in the Hill City area and U.S. Routes 14A and 85 in the Rapid City area.

Utility Policies and Regulations

Pursuant to Chapter 20:10:21 of the South Dakota Legislature's Administrative Rules, Black Hills Power shall develop a 10-year plan for its proposed transmission line. The plan shall include the general location of the line, a description of anticipated facilities associated with the line, a projected date by which the line will be removed from service, and the line's total estimated capital cost. Additionally, Black Hills Power shall describe how the proposed transmission line complements other regional utilities. Furthermore, Black Hills Power shall describe the methods used to identify, minimize, or avoid adverse impacts to economic, environmental, health, and public safety resources.

Utility corridor management regulations require Black Hills Power to notify the South Dakota Department of Transportation at least 10 working days prior to beginning construction activities in the corridor. Installation of the utility line or facility may not proceed until the utility corridor permit is issued. The installation of the utility line or facility shall be completed in an expeditious and safe manner and shall be finished within the time stated in the permit. Chapter 70:10:02:03 requires Black Hills Power to notify the area engineer at least two days prior to substantial completion of the utility installation.

Wyoming

Department of Transportation Plans

According to Wyoming State Department of Transportation plans, 10 projects are programmed for implementation within and adjacent to the project area. Campbell and Converse counties each include two projects that are scheduled to undergo preliminary engineering studies. In Weston County, three projects are scheduled for construction in 2010, and three are to undergo preliminary engineering studies. In Campbell County, one project includes reconstructing a five-mile section along State Route 450 between the Campbell-Weston county line and Reno. The second project includes adding capacity along a 13-mile section of State Route 59 midway between Gillette and Wright. In Converse County, plans include restoring and rehabilitating a 20-mile section along State Route 59 between Bill and the Campbell County line.

In Weston County, 2010 construction plans include an overlay along a seven-mile section of U.S. Route 16 between Osage and Newcastle; realigning a one-mile section of U.S. Route 85 five miles north of Newcastle; and another overlay along a nine-mile section of U.S. Route 85 originating in Four Corners and heading south. Weston County's preliminary engineering studies in the project area include grading along an eight-mile section of U.S. Route 16 just east of Newcastle, and widening a bridge for the same length and in the same location as the grading. The last project in Weston County includes developing a new rest area at the junction of U.S. Routes 16 and 85 in Newcastle. In addition to these projects, one of Wyoming's high priority transportation projects includes adding passing lanes along U.S. Route 85 between Newcastle and Lusk.

Utility Policies and Regulations

Concerning overhead power lines, Wyoming's Utility Accommodation Regulation of 1990 requires utilities to adhere to several provisions. The provisions allow only single pole construction for parallel encroachments and for crossings when the poles are located on highway right-of-way. The provisions also require poles to be located as close as possible to the highway right-of-way. In locations where

the line crosses the roadway's right-of-way, it shall cross as close to perpendicular to the roadway's centerline as practical. The power line shall also be a minimum of 18 feet above the roadway at maximum conductor or cable sag. Additional provisions prohibit poles to be located in the median portion of divided highways, and only under extenuating circumstances shall poles be placed within or through an interchange area.

7.1.1.3 Local Government Plans, Policies, and Regulations

The following discussions present local comprehensive plan policies and zoning regulations relative to future land use and utility infrastructure. It will be important to consider these policies and regulations during the routing process.

South Dakota

Custer County

In Custer County, the project area covers approximately six square miles, nearly all of which is in BHNF.

Lawrence County

In Lawrence County, the project area covers approximately 60 square miles, nearly all of which is in BHNF. Notable features in this area include U.S. Route 385, a recreational trail, and a 69 kV transmission line that links Pactola to the Lead/Deadwood area. According to the county's 2005 Comprehensive Plan Revision, this land is part of the county's Park Forest zoning district, the intent of which is to preserve the land's natural beauty and open character. Permitted uses on this land include detached, single-family dwellings; cabins and summer homes; agricultural buildings; public parks and/or playgrounds; historical monuments or structures; tree or crop growing areas; and grazing lands (Lawrence County, 2005). The county's 2009 Zoning Ordinance also permits utility easements and rights-of-way in the Park Forest district (Lawrence County, 2009). It is also important to note that the project area boundary is adjacent to the Nemo Rural Development Area, which the county designates as a Special Focus Area. The 2005 Comprehensive Plan Revision recommends preserving Nemo's rural character, including agricultural uses and the historic village center.

Meade County

In Meade County, the project area covers approximately 100 square miles, most of which is privately-owned. Notable features in this area include Interstate 90, the Canadian Pacific Railroad, a secondary road, and 69 kV, 115 kV, and 230 kV transmission lines. Lands west of the interstate are mostly under federal or state jurisdiction. Lands east of the interstate are mostly used for agriculture. The future land use map in the county's 2009 Comprehensive Plan continues these land uses (Meade County, 2009).

Pennington County

In Pennington County, the project area covers approximately 850 square miles, most of which is in BHNF. Notable features in this area include U.S. Routes 16 and 385, secondary roads, recreational trail loops, and a 69 kV transmission line linking Pactola to Osage in Weston County, Wyoming. The

largest population base in this portion of the project area is concentrated around Rapid City. Smaller communities include Clinton, Hill City, Keystone, Lange, and Pactola. The county's 2003 Comprehensive Plan largely keeps existing land use patterns intact. Relative to the project area, zoning districts include public land in BHNF, residential pockets surrounding communities, and a mix of commercial and residential uses surrounding Rapid City.

Wyoming

Campbell County

In Campbell County, the project area covers approximately 740 square miles, half of which is in TBNG. The remainder of the land is a mix of BLM, private, and state land. Notable features in this area include extensive oil and gas exploration and production activities surrounding the Reno/Teckla area, with additional activities between Reno and Interstate 90 to the north. Other features include State Route 450, a network of secondary roads, proposed routes for the DM&E Railroad, and 69 kV and 230 kV transmission lines. Pursuant to the county's 2005 Zoning Ordinance, essential public utilities are permitted in all but the Mobile Home Park District and Commercial District. Currently, the county is revising its zoning ordinance.

Converse County

In Converse County, the project area covers approximately 45 square miles, all of which is in TBNG. Pockets of private, agricultural land and state-owned land also exist in this area. Notable features include mining activities in the western portion and a proposed route for the DM&E Railroad. The county's Preliminary Draft 2009 Growth Management Plan seeks to coordinate development with utility providers to ensure adequate coverage.

Weston County

In Weston County, the project area covers approximately 1,600 square miles, most of which is in TBNG. BLM, private, and state-owned lands also exist in this area. Notable features include U.S. Route 16, State Routes 116 and 450, a recreational trail, secondary roads, the proposed DM&E Railroad, the BNSF Railroad, and 69 kV and 230 kV transmission lines. This area includes the communities of Cambria, Fairview, Four Corners, Newcastle, Osage, and Upton. According to Ray Pacheco, Weston County Planning and Zoning Director, the county does not have a zoning ordinance and its comprehensive plan is 30 years old (personal communication with R. Pacheco on January 7, 2010). Currently, there are no plans for developing and adopting a zoning ordinance.

7.1.1.4 Private Land

As mentioned above, private land, including agricultural, commercial, industrial, and residential parcels, exists throughout the project area. For purposes of routing the proposed transmission line, it is important to further discuss lands that may be leased for coal mining activities in the Campbell County portion of the project area.

In July 2010, the BLM issued the Final Environmental Impact Statement (EIS) for the Wright Area Coal Lease Applications. The BLM prepared the EIS to evaluate environmental impacts that are likely to occur should the BLM approve six pending coal lease applications near the Black Thunder

and North Antelope Rochelle mines in eastern Campbell County. In the EIS, the BLM's proposed action would hold a competitive lease sale and issue a maintenance lease for the tracts as applied for by the applicants. However, the BLM's preferred alternative would reconfigure the tracts, hold a competitive lease sale for the reconfigured tracts, and issue a maintenance lease for a tract that is larger than the original applied-for tract. Two of the six lease-by-application (LBA) tracts are of primary concern for the proposed transmission line routing: West Jacobs Ranch and West Hilight Field.

West Jacobs Ranch

The West Jacobs Ranch LBA tract is situated approximately 2.5 miles east of the Town of Wright. The BNSF and Union Pacific (UP) Railroad, North Hilight Field LBA tract, and the Black Thunder Mine border this tract to the east. State Route 450 and the West Hilight Field LBA tract border this tract to the south. Undeveloped land borders this tract to the west and north. The West Jacobs Ranch lease application covers approximately seven square miles. The BLM's preferred alternative would reconfigure this tract to include approximately 3.5 square miles, all of which would be situated outside of the current lease application boundaries.

West Hilight Field

The West Hilight Field LBA tract is situated approximately four miles southeast of the Town of Wright. The BNSF and UP Railroad and the Black Thunder Mine border this tract to the east. Undeveloped land borders this tract to the south and west. State Route 450 and the West Jacobs Ranch LBA tract border this tract to the north. The West Hilight Field lease application covers approximately 3.5 square miles. The BLM's preferred alternative would reconfigure this tract to include approximately seven square miles, all of which would be situated outside of the current lease application boundaries.

For each of the above LBA tracts, not all of the land is mineable because state and local highways overlie some of the coal resources. The Surface Mining Control and Reclamation Act of 1977 (SMCRA) prohibits mining within 100 feet of either side of the right-of-way of any public road. Should state and local government authorities relocate roads, the underlying coal resources could be mined. Should these authorities choose not to relocate roads, an applicant could mine coal adjacent to the 100-foot buffer beside the highway right-of-way.

Transmission Route Constraints

Routing the proposed transmission line along State Route 450 between the existing Black Thunder Mine and the pending lease applications for West Jacobs Ranch and West Hilight Field would seem to be a logical option given SMCRA's requirements. However, there are plans to relocate State Route 450 through the Black Thunder Mine and the pending lease application areas to provide access to the coal that exists in the road's right-of-way. Should project proponents route the proposed transmission line along this portion of State Route 450, the line would have to be moved before coal mining operations begin at the proponent's expense. Project proponents would incur substantial costs to move this approximate nine-mile-long transmission segment.

7.2 Visual Resources

Agency Visual Management data sets were obtained from the Wyoming BLM Newcastle Field Office, Wyoming BLM Buffalo Field Office, BHNH, and TBNG. Agencies provided Scenic Integrity Objectives data in the form of GIS shape files where available.

The trails and byways were identified within the study area, and were obtained from National Byways Online mapping (NSBO 2006), Wyoming and South Dakota State Byways websites, Wyoming BLM, and Wyoming and South Dakota Forest Service data sources.

7.2.1 Regulatory Setting

Two federal agencies have jurisdiction over public lands in the study area: the BLM and the USFS. These lands are administered by visual management objectives identified in BLM Resource Management Plans, Management Framework Plans, and USFS Forest Plans. The visual management objectives define the acceptable degree of visual change allowed in the natural landscape. Both the USFS and the BLM derive visual management objectives for their lands by combining scenic attractiveness (e.g., landscape aesthetics), visual sensitivity, and visibility from sensitive viewpoints.

The BLM utilizes the Visual Resource Management system (as outlined in Visual Resource Management Manual Section 8411) to manage visual resources on public lands. As with the USFS system, the BLM utilizes the Visual Resource Management system to establish standards on managed lands that allow for various levels of change as typically detailed in the agency Resource Management Plan. For a description of the four Visual Resource Management class designations refer to Table 1.

Visual resources on USFS lands are managed under the Scenery Management System or under the Visual Management System if the forest plan for a particular forest has not been updated since 1995. The focus of both systems is to establish standards for landscape management that allow for various levels of change as a result of management activities. Under the Scenery Management System, Scenic Integrity Objectives (Visual Quality Objectives under the old system) are established on USFS lands. Both the TBNG and BHNH use the newer Scenic Integrity Objectives and they are described in Table 1.

TABLE 1 BLM VISUAL RESOURCE MANAGEMENT CLASSES AND USFS SCENIC INTEGRITY OBJECTIVES

BLM VISUAL RESOURCE MANAGEMENT CLASS	USFS SCENIC INTEGRITY OBJECTIVES
Class I: This class provides primarily for natural ecological changes; however, it does not preclude very limited activity. Any contrast created must not attract attention.	Very High: Landscape character is intact with only minute if any deviations. The existing landscape character and sense of place is expressed at the highest level.
Class II: Changes in any of the basic elements (form, line, color, texture) caused by a management activity should not be evident in the characteristic landscape. Contrasts may be seen but should not attract attention.	High: Landscape character appears intact. Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such a scale that they are not evident.
Class III: Contrasts to the basic elements (form, line, color, texture) caused by a management activity may be evident and begin to attract attention in the characteristic landscape.	Moderate: Landscape character appears slightly altered. Noticeable deviations must remain visually subordinate to the landscape character being viewed.

Changes should remain subordinate to the existing characteristic landscape.	
Class IV: Contrasts may attract attention and be a dominant feature of the landscape in terms of scale; however, the change should repeat the basic elements (form, line, color, texture) inherent in the characteristic landscape.	Low: Landscape character appears moderately altered. Deviations begin to dominate the valued landscape character being viewed, but they borrow valued attributes outside the landscape being viewed.
	Very Low: Landscape character appears heavily altered. Deviations may strongly dominate the valued landscape character. They may not borrow from valued attributes outside the landscape being viewed, but must be shaped and blended with the natural terrain so that elements do not dominate the composition.
	Unacceptably Low: Landscape character appears extremely altered. Deviations are extremely dominant and borrow little if any form, line, color, texture, pattern, or scale from the landscape character. Used to inventory existing integrity, not a management type.

Source: BLM 1984a, USDA 1974

7.3 Cultural Resources

Cultural resources include districts, sites, buildings, structures, or objects important to a culture, subculture, or community of scientific, traditional, religious or other reasons. For this Siting Study Report, cultural resources have been divided into three major categories: archaeological resources, architectural resources, and known or potential sacred sites.

Archaeological resources are locations where human activity has measurably altered the earth or left deposits of physical remains (e.g., tipi rings, cairns, stone tools, petroglyphs, house foundations, trails, bottles, tin cans). Most archaeological resources in Wyoming and South Dakota are Native American or Euro-American origin.

Architectural resources include standing buildings (e.g. houses, barns, outbuildings, mills, schools, churches) and intact structures (e.g., dams, canals, fence lines, roads, bridges, mine adits). Most architectural resources in the Study Area are Euro-American.

Resources of special concern to Native Americans are resources considered to be of significant interest to Native Americans. Because of their sensitivity, few of these sites have been publicly identified as such by Native American groups. However, data from the Wyoming Cultural Records Office (WYCRO) and Archaeological Resource Management System (ARMS) suggests that in both states certain classes of archaeological sites (e.g. pictographs and petroglyphs, Native American graves, vision quest sites, medicine wheels) are often considered to be of significant interest to Native American groups. Other archaeological features, such as tipi rings and rock cairns, are considered significant by some Native American groups as well.

In addition, the TBNG and the BBNF have defined potential areas having special scenic, historical, geological, botanical, zoological and/or paleontological characteristics as Special Interest Areas (SIA). There are known SIAs in both the Wyoming portion of the project area (the Buffalo Ridge

SIA and the Cellars SIA) and the South Dakota portion as well (Hat Mountain SIA). These areas have been identified as areas of special concern to Native Americans. In addition, the Buffalo Divide SIA is eligible for the National Register of Historic Places.

To obtain general information on cultural resources for this Siting Study, the following sources of data were used:

- The National Register database (NPS Focus) of the National Register of Historic Places (NRHP)
- The National Historic Landmarks Survey of the National Park Service (NPS)
- Summaries of the prehistory and history of eastern Wyoming and western South Dakota
- Telephone and in-person interviews with BBNF and TBNG cultural resource staff
- Summary data provided by the Wyoming State Historical Society in Wheatland and the South Dakota Historic Society in Pierre.

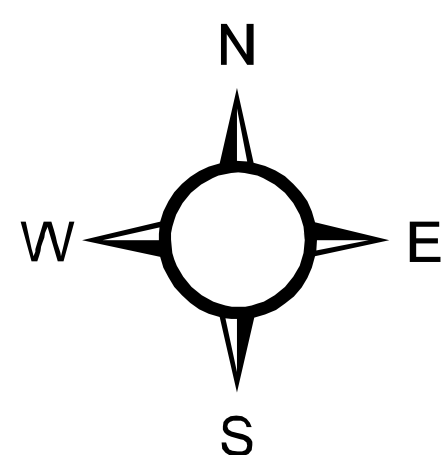
In the Wyoming portion of the study area, thousands of cultural resources have been previously recorded. Of the 5,781 Wyoming sites, 1,215 are eligible to the NRHP, with the majority being determined eligible with State Historic Preservation Office (SHPO) concurrence, 3,200 are ineligible, 1,327 are unevaluated, and 39 are listed in the NRHP. Preliminary analysis suggests that the majority of the previously recorded sites are prehistoric, followed by multi-component sites, historic sites, and finally sites of undetermined age.

For South Dakota, of the over 2,000 previously recorded sites within the Study Area, 516 have been preliminarily analyzed. Based on an interpretation of these 516 sites, the majority of them appear to be historic followed by prehistoric. Of the 516 previously recorded sites, 80 are categorized in the data base as eligible to the NRHP, 283 are categorized as ineligible, and 153 are unevaluated. None are listed in the NRHP

Even with the large numbers of recorded sites, both states have relatively limited cultural resource survey. In Wyoming only 6 percent of the state has been surveyed for cultural resources (Wyoming Preservation Plan 2007-2015). The approximate percentage of South Dakota that has been surveyed for cultural resources is unknown at this time. Therefore, it is likely that the many cultural resources in both areas have never been identified or documented.

7.4 Biological Resources

Data and information on wildlife and botanical resources within the study area were obtained from the USFWS, BBNF, TBNG, BLM Newcastle Field Office, South Dakota Department of Game, Fish, and Parks, Wyoming Game and Fish Department, personal communications with the TBNG and BBNF, and both study area and county-level data exports for known special status species occurrences from the Wyoming Natural Diversity Database (WYNDD; 2009) and the South Dakota Natural Heritage Program (SDNHP 2009). Plant and wildlife nomenclature were verified using the Integrated Taxonomic Inventory System (ITIS) to check for species that have synonymous names (ITIS 2009). Specific information for each applicable federal or state agency is described further below.



Scale 1:249,000

0 2.5 5 10 15 Miles

Black Hills Power Teckla-Osage-Rapid City 230kV Transmission Line Project

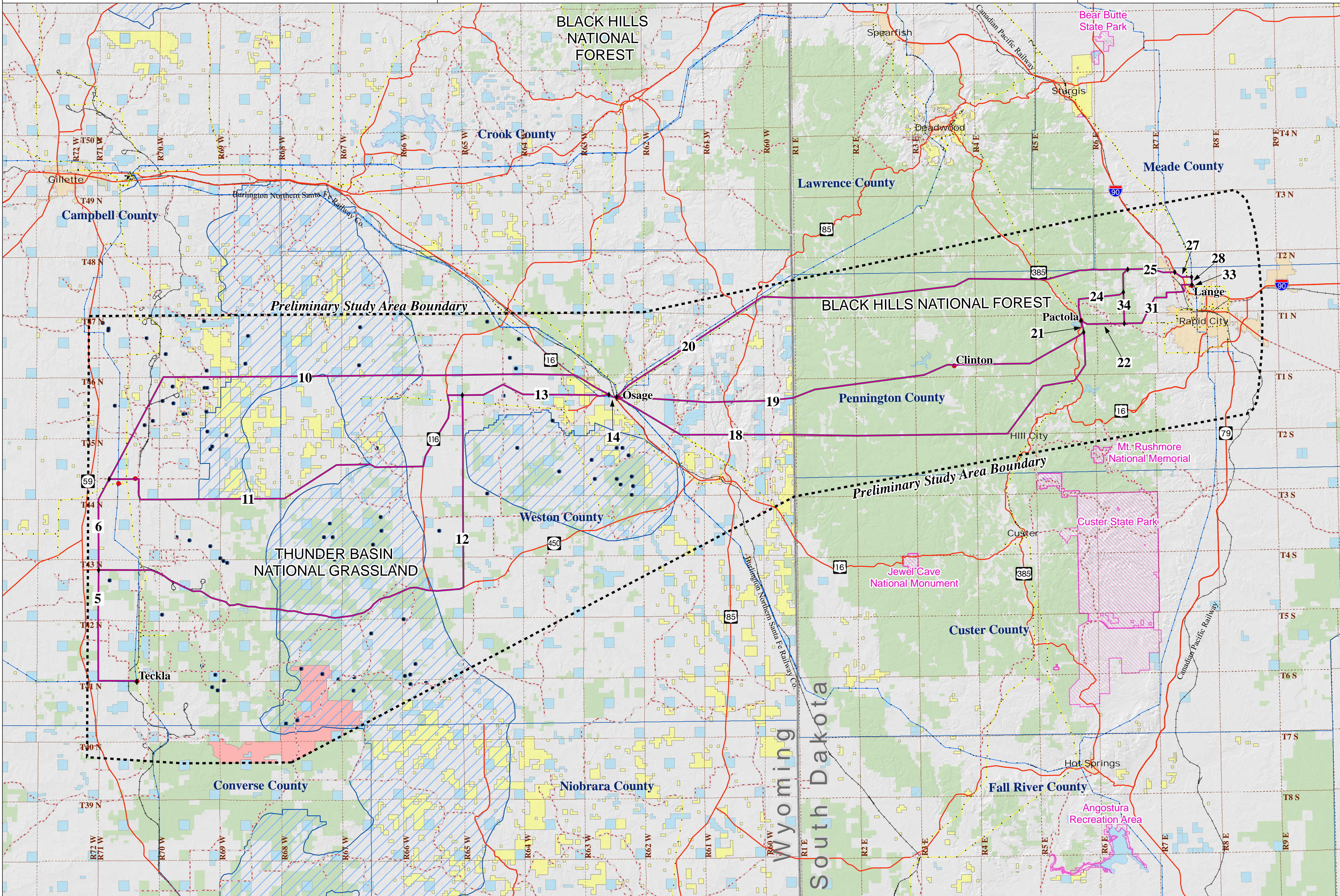
Project Area Biological Resources



Project: R:\117390_\App\ResourceMaps\Report\Wildlife

Figure 3

Date Printed: 1/27/2011



Legend

Project Components

- Node Separating Links
- Proposed Route Link
- Project Study Area

Biological Resources

- Sage Grouse Lek
- Sage Grouse Core Area
- Ferret Reintroduction Area

Jurisdiction

- Bureau of Land Management
- U.S. Forest Service
- State or National Park
- State Land
- Private

Utility Features

- Existing Substation
- ≤69kV Transmission Line
- 230kV Transmission Line

Transportation Features

- Secondary Road
- Interstate or Major Highway
- Railroad

Administrative Boundaries

- City Boundary
- County Boundary
- State Boundary

7.4.1 Regulatory Setting

The study area falls within the Mountain-Prairie Region of the USFWS. The Ecological Field Services office with jurisdiction over the Wyoming portion of the study area is located in Cheyenne, WY. The Ecological Field Services office with jurisdiction over the South Dakota portion of the study area is located in Pierre, SD. Both state USFWS offices maintain county lists of threatened, endangered, candidate, and species of concern that occur or have the potential to occur, based on species' range extent and habitat suitability (USFWS 2005, 2008, 2009a, 2009b). The USFWS administers the following federal laws pertaining to the study area:

- Endangered Species Act of 1973, Public Law 93-205 (ESA), which protects suitable habitat and prohibits the take of any species federally listed as threatened or endangered.
- Migratory Bird Treaty Act, 16 USC 703 (MBTA), which prohibits the take of migratory birds.
- Bald and Golden Eagle Protection Act, 16 USC 668 (BGEPA), which prohibits the take of bald eagles and golden eagles.

Two federal agencies have jurisdiction over public lands in the study area: the BLM and the USFS. These lands are administered by biological resource management objectives identified in BLM Resource Management Plans (RMPs) and USFS Forest Plans. These plans delineate regions of their respective jurisdiction which may have specific management goals, special status species, vehicle restrictions, and seasonal restrictions.

The BHNF and the TBNG are both in USFS Region 2 (R2), so both adhere to the R2 Sensitive Species List (USFS 2007). In addition to the R2 list, the BHNF includes the Black Hills Species of Local Concern (SOLC) list in their management decisions. USFS Sensitive species are those for which there are viability concerns as determined by the regional forester. If not previously identified in the respective Forest Plans, necessary mitigation measures for R2 Sensitive species and SOLCs would be determined through consultation with the appropriate USFS managers, botanists, and wildlife biologists. The BHNF also designates Botanical Areas and Research Natural Areas which would not be suitable for transmission line siting. The USFS regulations and Forest Plans that pertain to the BHNF and the TBNG include:

- 1997 Revision - Black Hills National Forest Land and Resource Management Plan, as amended October 2005 (USFS 2005).
- Land and Resource Management Plan for the Thunder Basin National Grassland (USFS 2001).
- Forest Service Manual 2600, Chapter 2630 – Management of wildlife and fish habitat; Supplement No.: 2600-2004-1 (USFS 2004).
- Forest Service Manual 2600, Chapter 2670 – Threatened, endangered and sensitive plants and animals; Supplement No.: 2600-2007-1 (USFS 2007).

A small portion of the study area in Wyoming is under the jurisdiction of the BLM Newcastle Field Office (FO). The BLM Newcastle FO also designates sensitive species which could become endangered or extinct in a state (BLM 2009). Necessary mitigation measures for BLM sensitive species would be determined through consultation with appropriate BLM land managers out of Newcastle FO.

The South Dakota Department of Game, Fish, and Parks (SDGFP) regulates state threatened, endangered, and candidate species for protection under South Dakota Codified Law 34A-8, which prohibits the take of state and/or federally threatened or endangered plant and animal species, unless otherwise permitted by SDGFP. The SDGFP houses the South Dakota Natural Heritage Program (SDNHP), which maintains an updated the list of state threatened, endangered, and candidate species (SDGFP 2008).

The state of Wyoming has no state-level endangered species act or other similar legislation. However, the state of Wyoming does provide specific regulatory protections to the Greater Sage Grouse (*Centrocercus urophasianus*; WYGFD 2010). State of Wyoming Executive Order 2010-4 (Greater Sage Grouse Core Area Protection) stipulates that “New transmission lines constructed within Core Population Areas will be consistent with this Executive Order if they are constructed between July 1 and March 14 (or between July 1 and November 30 in winter concentration areas) and within one half (1/2) mile either side of existing 115 kV or larger transmission lines. New transmission outside this one (1) mile wide corridor within Core Population Areas should be authorized or conducted only when it can be demonstrated that the activity will not cause declines in Greater Sage-Grouse populations.”

New transmission which does not fall within the one mile wide corridor must fall within one of three categories:

- The project must show that no suitable habitat is present in one contiguous block of land that includes at least a 0.6 mile buffer between the project and suitable habitat;
- No sage-grouse use occurs in one contiguous block of land that includes at least a 0.6 mile buffer between the project area and adjacent occupied habitat, as documented by the absence of sage-grouse droppings and an absence of activity for the previous ten years;
- Provisions of a development and mitigation plan that has been implemented and demonstrated by previous research not to cause declines in sage-grouse populations. The demonstration must be based on monitoring data collected and analyzed with accepted scientific based techniques.

USFWS

USFWS lists of federally threatened, endangered, and candidate species that occur or have the potential to occur in the study area counties were cross-referenced with the data exports from the WYNDD (2009) and SDNHP (2009). Federally threatened and endangered plants and animals are listed below with the state in which they occur, the year of the last recorded observation, habitat, and likelihood of occurrence in the study area (Table 2). Table 2 lists species which have historical records of occurrence in the study area and in the surrounding area. Species with an asterisk have known occurrences within the study area. If a species only has protection in one state (i.e. state of South Dakota endangered) but no record of occurrence in the study area of that state, it was not included in the table.

TABLE 2 STATE AND FEDERALLY PROTECTED SPECIES IN PROXIMITY OF STUDY AREA

SPECIES	STATUS	YEAR LAST OBSERVED AND STATE OF OCCURRENCE IF KNOWN TO PROJECT COUNTIES	HABITAT	LIKELIHOOD OF OCCURRENCE IN STUDY AREA
Amphibians				
Northern Leopard Frog* (<i>Rana pipiens</i>)	ESA Petitioned; USFS R2 Sensitive; BLM Sensitive	Wyoming (1999)	A wide range of aquatic habitats: streams, bogs, marshes, wet meadows, ponds, and lakes, usually with aquatic vegetation. May be found far from water.	Occurs.
Birds				
American Dipper* (<i>Cinclus mexicanus</i>)	South Dakota Threatened	South Dakota (2003)	Fast moving, clear, unpolluted streams and rivers with rock or sand bottom.	Occurs.
Bald Eagle* (<i>Haliaeetus leucocephalus</i>)	Bald and Golden Eagle Protection Act; South Dakota Threatened; USFS R2; BLM Sensitive	Wyoming (2008); South Dakota (2009)	Forages over large permanent bodies of water such as rivers, lakes, and reservoirs.	Occurs.
Greater Sage Grouse* (<i>Centrocercus urophasianus</i>)	ESA Candidate; USFS R2 Sensitive; BLM Sensitive	Wyoming (2006)	Mature sagebrush shrubland habitat specialist. Sagebrush or grassy meadows adjacent to sagebrush.	Occurs.
Interior Least Tern (<i>Sterna antillarum</i>)	ESA Endangered; South Dakota Endangered	South Dakota (2009)	Large sandy river bars and sandy beaches of large lakes and reservoirs devoid of vegetation.	Low probability of occurrence.
Osprey* (<i>Pandion haliaetus</i>)	South Dakota Threatened	South Dakota (2009)	Large rivers, lakes, and ponds which provide suitable fish for forage.	Occurs.
Piping Plover (<i>Charadrius melodus</i>)	ESA Threatened; South Dakota Threatened	Wyoming (1988)	Large sandy river bars and sandy beaches of large lakes and reservoirs devoid of vegetation.	Low probability of occurrence.
Sprague's Pipit (<i>Anthus spragueii</i>)	ESA Petitioned	Unknown to project area, however only petitioned in late 2009	Shortgrass prairies of moderate density and height with bare ground. Even low densities of shrubs are avoided.	Low probability of occurrence.
Whooping Crane* (<i>Grus americana</i>)	ESA Endangered; South Dakota Endangered	South Dakota (1981)	Roosting habitat includes emergent wetlands, broad prairie rivers, and lake and pond edges with no tall	Historically occurred. Low probability of occurrence.

TABLE 2 STATE AND FEDERALLY PROTECTED SPECIES IN PROXIMITY OF STUDY AREA

SPECIES	STATUS	YEAR LAST OBSERVED AND STATE OF OCCURRENCE IF KNOWN TO PROJECT COUNTIES	HABITAT	LIKELIHOOD OF OCCURRENCE IN STUDY AREA
Yellow-billed Cuckoo* (<i>Coccyzus americanus</i>)	ESA Candidate; USFS R2 Sensitive; BLM Sensitive	Wyoming (1985)	vegetation to obscure visibility. Low, dense, shrubby thickets. Typically in riparian areas.	Historically occurred. Moderate probability of occurrence.
Fish				
Finesale Dace (<i>Phoxinus neogaeus</i>)	South Dakota Endangered; USFS R2 Sensitive	South Dakota (1998)	Pools of headwater streams, rivers, ponds, and lakes. Common in beaver ponds.	Moderate probability of occurrence.
Longnose Sucker* (<i>Catostomus catostomus</i>)	South Dakota Threatened	South Dakota (1983)	Cold, clear waters of deep lakes. Spawns over gravel runs in shallow streams.	Historically occurred. Moderate probability of occurrence.
Pallid sturgeon (<i>Scaphirhynchus albus</i>)	South Dakota Endangered	Unknown to project counties.	Turbid water in large, free flowing rivers.	Low probability of occurrence.
Sturgeon Chub (<i>Macrhybopsis gelida</i>)	South Dakota Threatened; USFS R2 Sensitive	South Dakota (1997)	Continuously and heavily turbid, warm, medium to large rivers	Low probability of occurrence.
Mammals				
Black-footed Ferret* (<i>Mustela nigripes</i>)	ESA Endangered; South Dakota Endangered	Wyoming (1979); South Dakota (2002)	Exclusively occupies black-tailed prairie dog (<i>Cynomys ludovicianus</i>). Reintroduction has been established in Wind Cave N.P., Badlands N.P., and Conata Basin, SD.	Historically occurred. Low probability of occurrence. Reintroduction to Thunder Basin National Grassland scheduled for fall 2010.
Canada Lynx* (<i>Lynx canadensis</i>)	ESA Threatened	Wyoming (1984)	Boreal and montane regions dominated by coniferous or mixed forest with thick undergrowth.	Historically occurred. Low probability of occurrence.
Gray Wolf* (<i>Canis lupus</i>)	ESA Endangered	Wyoming (1906)	Wide range of habitats, generally away from human disturbance with large ungulate prey base.	Historically occurred. Low probability of occurrence.
Grizzly Bear (<i>Ursus arctos horribilis</i>)	ESA Threatened; USFS R2 Sensitive	Wyoming (1913)	Previously a wide range of habitats, currently limited to	Low probability of occurrence.

TABLE 2 STATE AND FEDERALLY PROTECTED SPECIES IN PROXIMITY OF STUDY AREA

SPECIES	STATUS	YEAR LAST OBSERVED AND STATE OF OCCURRENCE IF KNOWN TO PROJECT COUNTIES	HABITAT	LIKELIHOOD OF OCCURRENCE IN STUDY AREA
			tundra, alpine tundra, or sub-alpine forests.	
North American River Otter (<i>Lontra canadensis</i>)	South Dakota Threatened; USFS R2 Sensitive	South Dakota (2004)	Rivers, streams, ponds, lakes, and marshes.	Moderate probability of occurrence.
Swift Fox* (<i>Vulpes velox</i>)	South Dakota Threatened; USFS R2 Sensitive; BLM Sensitive	Wyoming (2008) South Dakota (1985)	Open prairie and arid plains.	Occurs.
Wyoming Pocket Gopher (<i>Thomomys clusius</i>)	ESA Petitioned; USFS R2 Sensitive	Wyoming (1915)	Gravelly, loose, well-drained soils on ridge tops and along the edges of deeply eroded stream-cut washes	Low probability of occurrence.
Plants				
Blowout Pentstemon (<i>Penstemon haydenii</i>)	ESA Endangered	Unknown to project counties.	"Blowouts" or sparsely vegetated depressions in active sand dunes created by wind erosion.	Moderate probability of occurrence.
Ute Ladies'-tresses (<i>Spiranthes diluvialis</i>)	ESA Threatened	Wyoming (2009)	Emergent wetlands, floodplains, seasonal streams, and lake shores.	Moderate probability of occurrence.
Western Prairie Fringed-orchid (<i>Platanthera praeclara</i>)	ESA Threatened	Unknown to project counties.	Moist to somewhat dry prairies.	Moderate probability of occurrence.
* Indicates a Natural Heritage Program (WYNDD or SDNHP) documented occurrence in the study area, including historical records (≥25 years ago or 1985 and earlier).				

Thunder Basin National Grassland

A data request was made to TBNG for any spatial information regarding threatened, endangered, or sensitive plant and animal species and their protected habitats on the grassland. The TBNG did not provide species specific location data for either wildlife or botanical species at this time. All data regarding TBNG was taken from the TBNG Resource Management Plan. Certain information obtained from the Resource Management Plan included mapped prairie dog towns, big game range, and black-footed ferret reintroduction habitat. Nesting habitat of the mountain plover limits it to vast barren areas such as prairie dog towns. The mapped prairie dog towns received from the TBNG could be used to identify suitable mountain plover habitat. The TBNG Land and Resource Management Plan FEIS specified that sharp-tailed grouse only occupied the Upton-Osage Geographic Area. A phone conversation with Amy Ormseth, the chief contact for TBNG, revealed that the

grassland is scheduled to receive a small population of black-footed ferret (*Mustella nigripes*) for reintroduction in the fall of 2010. Currently there are no black-footed ferrets on the grassland and Ms. Ormseth did not indicate where on the grassland the introductions might take place.

Black Hills National Forest

GIS layers of R2 sensitive and species of local concern (SOLC) plant species on the BHNF were obtained from Chelsea Vollmer, the forest botanist out of Custer, SD. The abandoned 69 kV right-of-way discussed previously passes directly through a known population of pleated gentian (*Gentiana affinis*), a Species of Local Concern on the BHNF. BHNF did not provide any wildlife species specific location information. All available wildlife species specific location information acquired for the state of South Dakota, including the BHNF, was obtained through the South Dakota Natural Heritage Program (SDNHP). Other GIS layers covering the BHNF were downloaded from the BHNF GIS Data web page (<http://www.fs.fed.us/r2/blackhills/projects/gis/index.shtml>). The USFS management areas layer delineates sensitive biological areas such as botanical areas, big game management areas, the Black Elk Wilderness area, and the Norbeck Wildlife Preserve. The same management areas layer also delineates management areas that are more appropriate for transmission line siting, such as management areas with a resource production emphasis, limited motorized use and forest product areas, and private in holdings throughout the forest. Botanical Areas designated by the Black Hills National Forest Management Plan located in the study area are Black Fox Valley, North Fork Castle Creek, McIntosh Fen, and Canyon City.

Special status wildlife species specified by BHNF personnel concerning the study area are northern goshawk (*Accipiter gentilis*), osprey (*Pandion haliaetus*), and the callused vertigo (*Vertigo arthuri*). The callused vertigo is a sensitive species of snail which occurs on the BHNF. Special status plant species specified by BHNF personnel concerning the study area include slender moonwort (*Botrychium lineare*), large yellow lady's slipper (*Cypripedium parviflorum*), northern gentian (*Gentiana affinis*), sweet-coltsfoot (*Petasites sagittatus*), sage willow (*Salix candida*), autumn willow (*Salix serissima*), and highbush cranberry (*Viburnum opulus* var. *americanum*).

Wyoming Fish and Game Department

Data regarding Executive Order 2010-4: Greater Sage Grouse Core Area Protection was obtained through an FTP download site made available by Tom Christiansen of the Wyoming Fish and Game Department. A copy of Executive Order 2010-4: Greater Sage Grouse Core Area Protection and Stipulations for Development in Core Sage Grouse Population Areas were obtained from the Wyoming Fish and Game website (WYGFD 2010). In addition to the Greater Sage Grouse information, the FTP download site included GIS information regarding big game habitat throughout Wyoming.

Natural Heritage Programs

The Wyoming Natural Diversity Database (WYNDD) provided a list of all known occurrences of special status species in the study area and for the study area counties at the township – range level. The SDNHP provided a GIS layer of all special status species in the study area counties. Occurrences of special status plant and wildlife species from both states were summarized to include only those that are USFWS endangered, threatened, candidate, or petitioned; on the USFS R2 special status

species list; on the BLM Newcastle FO special status species list; and/or SOLC species specifically mentioned by the BBNF.

There are six USFWS ESA endangered, threatened, candidate, or petitioned species that are known to currently occur in the study area, including one amphibian, four birds, and one mammal (Table 2). There are three South Dakota state threatened bird species known to occur in the South Dakota part of the study area, none which have any USFWS ESA status (Table 2). There are 69 USFS R2 or SOLC special status species known to occur in the study area counties, 40 which are known to occur in the study area. These 40 species include 20 birds, 9 plants, 5 mammals, 2 fishes, 2 invertebrates, 1 amphibian, and 1 reptile. There are 22 BLM Newcastle FO special status species, 19 which are known to occur in the study area, but only four species that are not otherwise designated under USFWS or USFS, including one bat, two birds, and one plant.

7.5 Water Resources

Digital stream data were obtained from the USFWS National Wetland Inventory (NWI) and the National hydrologic database from U.S. Geological Survey.

Wetlands were identified using NWI maps, which provide approximate locations of wetlands one acre or larger and may or may not be jurisdictional based on the 1987 USACE Wetlands Delineation Manual.

Digital floodplain data were available from the Federal Emergency Management Agency for South Dakota. The floodplain data for Wyoming was not in a readily usable format for this report.

7.5.1 Regulatory Setting

7.5.1.1 Clean Water Act

Waters of the U.S., including wetlands, are subject to U.S. Army Corps of Engineers (USACE) jurisdiction under Section 404 of the Clean Water Act (CWA). A Section 404 permit is required for the discharge of dredged or fill material into Waters of the U.S. The Omaha District of the USACE provides regulatory review and permitting services for both the Wyoming and South Dakota portions of the project.

Pursuant to Section 401 of the CWA, the Wyoming Department of Environmental Quality and the South Dakota Department of Environment and Natural Resources provide water quality certification to determine if a proposed project will violate applicable state water quality standards. Water quality certification is mandatory for all projects requiring a Section 404 permit.

Federal and state laws regulate the quality of surface waters in Wyoming and South Dakota, including the Federal CWA; Wyoming Environmental Quality Act, Title 35, Chapter 11, Environmental Quality; and South Dakota Title 34A, Environmental Protection, Chapter 2, Water Pollution Control. Wyoming Department of Environmental Quality and South Dakota Department of Environment and Natural Resources are responsible for protecting and regulating the beneficial uses of each state's surface waters and they rely on the water quality standards set forth by the Environmental Protection Agency for identifying potential causes of impairment. The respective state regulatory departments designate uses for specific water bodies of each state. The degree of support or attainment of a

designated use for a particular stream is determined by an analysis of biological, physiochemical, physical-habitat, and toxicity data. Each designated use is assessed as full support (good), partial support (fair), or nonsupport (poor). Streams in which at least one designated use is not fully supported are considered “impaired” and submitted to the EPA under Section 303(d) of the CWA as a prioritized list of impaired waters or 303(d) list.

7.5.1.2 Construction Storm Water Program

Construction activities in both states must comply with the National Pollutant Discharge Elimination System for discharges of storm water runoff associated with a construction activity.

7.5.1.2.1 Wyoming

In Wyoming, the Wyoming Department of Environmental Quality regulates storm water requirements for construction activity. The Wyoming Department of Environmental Quality requires permitting for discharge of storm water from new and existing “large construction activities” that result in disturbance of five acres or more of total land area (General Permit to Discharge Storm Water Associated with Large Construction Activity). Construction activity subject to this permit includes discharges from new and existing “large construction activities”; areas dedicated to producing earthen materials such as sand and gravel; discharges from asphalt batch plants and concrete batch plants; and discharges from dewatering of collected storm water and minor amounts of ground water from excavations and depressions on a permitted site.

The Wyoming General Permit to Discharge Storm Water Associated with Large Construction Activity requires a Notice of Intent, Storm Water Pollution Prevention Plan (SWPPP), and annual fee(s). Receipt by the Wyoming Department of Environmental Quality of the complete Notice of Intent package constitutes a full agreement by the permittee to meet and comply with all requirements stated in the General Permit. Coverage under the General Permit remains in effect until the permittee submits a Notice of Termination.

The Wyoming General Permit requires the development and implementation of a SWPPP. For projects disturbing more than 100 acres, the permittee must submit the SWPPP with the Notice of Intent. Any SWPPP that is prepared for a construction activity must be developed and implemented using standard engineering practices. The SWPPP must include at a minimum: SWPPP Administrator, site description, site map, erosion and sediment controls, construction site dewatering, post construction controls, operational controls, maintenance, inspections, and the appropriate signatures. The SWPPP must list Best Management Practices (BMPs) and Storm Water Management Controls the discharger will use to manage storm water runoff before, during, and after construction. BMPs must minimize or prevent “significant sediment” from leaving the construction site.

7.5.1.2.2 South Dakota

In South Dakota, the South Dakota Department of Environment and Natural Resources regulates storm water requirements for construction activity referred to as surface water discharge permits. The South Dakota Department of Environment and Natural Resources requires permitting for discharge of storm water from construction activities including clearing, grading, and excavation that result in disturbance of one or more acres of total land area and those construction site discharges designated by the Secretary as needing a storm water permit (General Permit for Storm Water Discharges

Associated with Construction Activities). Construction activity subject to this permit includes clearing, grading, or excavation; road building; construction of residential, commercial, and industrial buildings; installing pipelines, cable lines, and phone lines; and demolition activities performed during construction projects. Construction activity includes the disturbance of any sites that are part of a larger plan or sale may also need a permit, if the total plan meets the acreage requirement.

The South Dakota General Permit for Storm Water Discharges Associated with Construction Activities requires a Notice of Intent form to be submitted at least 15 days prior to starting the project and a SWPPP. Receipt by the Department of Environment and Natural Resources of the complete Notice of Intent package constitutes a full agreement by the permittee to meet and comply with all requirements stated in the General Permit. Coverage under the General Permit remains in effect until the permittee submits a Notice of Termination.

The South Dakota General Permit requires the development and implementation of a SWPPP. Any SWPPP that is prepared for a construction activity must be developed and implemented using standard engineering practices. The SWPPP must include a minimum of the following: a site description, erosion and sediment controls, storm water management, other controls, approved local plans, maintenance, and inspections. The SWPPP must list BMPs and Storm Water Management Controls the discharger will use to manage storm water runoff before, during, and after construction. BMPs must minimize or prevent “significant sediment” from leaving the construction site.

7.5.1.3 Local Floodplain Permits

A number of counties in Wyoming and South Dakota have floodplain ordinances and require permits for proposed actions, such as construction of buried or suspended utility lines, material and equipment storage, and construction activity and structure placement in the floodplain. One county in Wyoming requires a floodplain permit, which is Converse County. Utility projects are exempt from permitting in Campbell County and Weston County has no floodplain ordinance. The South Dakota counties requiring floodplain permits include Custer, Lawrence, Meade, and Pennington. A permit application and fee must be submitted to the appropriate county government.

8.0 SENSITIVITY ANALYSIS

The resource inventory data and associated maps were used as a basis for sensitivity analysis. Criteria were developed for each resource to help determine the sensitivity to the siting and construction of a transmission line. Further, the sensitivity levels were intended to provide geographic opportunities and constraint parameters for locating potential alternative corridors. Sensitivity is defined as a measure of probable adverse response of a resource to direct and indirect impacts associated with the construction, operation and maintenance of a transmission line. The determination of sensitivity generally included consideration of the following:

- **Resource Value:** A measure of rarity, intrinsic worth, singularity, or diversity of a resource within a particular area.
- **Protective Status:** A measure of the formal concern as expressed by legal protection or special status designation.
- **Present and Future Uses:** A measure of the level of potential conflict with land management and land use policies.
- **Hazards:** A measure of the degree to which construction and operation of the transmission line could be affected by a known resource hazard.

Using this framework, the mapped inventory data were analyzed and assigned relative sensitivity values. Sensitivity maps were developed for land use, visual, cultural, biological and water resources. Sensitivity levels were categorized as exclusion, high, moderate or low based upon the following characteristics:

- **Exclusion:** Areas where the siting of transmission lines is essentially precluded. This category includes:
 1. Areas which contain policies for legally protected resources (e.g. wilderness area, national park);
 2. Where government regulation expressly prohibits encroachment;
 3. Where ownership and use of the land preempts the siting of a transmission line; and
 4. Areas where there would be unacceptable hazards to the construction or operation of a transmission line.
- **High:** Includes areas which have the following characteristics:
 1. Unique, highly valued or complex resource areas;
 2. Significant potential conflict with a current or planned use;
 3. Areas possessing substantial hazards to construction and operation of a transmission line;
 4. Resource areas or conflicts with identified hazards typically requiring long term and costly mitigation or high design and construction costs;
 5. Areas which could require lengthy, complex review and permitting requirements with likelihood of approval uncertain or low;
 6. areas which have a high level of concern for potential high impacts to a resource;
 7. mitigation is not likely to be effective in substantially reducing significant impacts; and
 8. resource is considered to be of exceptional value in its present or un-disturbed state.

For the purposes of this study, areas designated as high sensitivity are considered to be the least desirable and should be avoided, if possible.

- **Moderate:** Includes areas which have the following characteristics:
 1. The presence of resources that are important, valued and/or assigned special status;
 2. Resources with moderate (some) potential conflict with current or planned use;
 3. Limited hazards to construction and operation of a transmission line;
 4. Resource sensitivity is of concern but has a reasonable potential for mitigation to reduce high impact, depending on the severity of the impact; and
 5. Resources in this sensitivity level may in some instances be proposed for a specific land management designation, but have not officially been designated.
- **Low:** Includes areas which have the following characteristics:
 1. Areas which have not been classified as exclusion, high or moderate;
 2. Areas where, if permits are required, they are routinely issued;
 3. Areas with little or no conflict with existing or planned use;
 4. No cultural resources or no valued or special status biological or water resources; and
 5. No hazards to construction or operation of a transmission line.

For the purposes of this study, areas designated as low sensitivity are most desirable for the siting of a transmission line. It should be noted, however, that additional site specific studies could reveal other sensitive resources not currently inventoried through the environmental study process.

The following sections describe the sensitivity criteria used for each resource area.

8.1 Land Use

The following discussions present a sensitivity analysis for lands in the project area. The sensitivity analysis gauges the lands' suitability for accommodating the proposed transmission line. To this end, the analysis categorizes land by exclusion areas and by areas that exhibit high, moderate, and low sensitivity. In general, the lower an area's sensitivity, the more suitable it might be for routing the proposed transmission line. Exclusion areas and high, moderate, and low sensitivity areas are defined below.

8.1.1 Exclusion Areas

Exclusion areas include lands that feature legally-protected resources and lands that government policies and/or regulations prohibit from being developed. For purposes of routing the proposed transmission line, exclusion areas include culturally significant resources, such as archaeological sites that would be directly affected by project construction, and traditional cultural properties; areas designated by Congress as wilderness; and rare, threatened, and endangered species habitat. For a detailed discussion of these resources, please refer to the appropriate resource sections of this report.

Based on land use information and coordination with BBNF and TBNG staff, exclusion areas also include:

- Black Hills Experimental Forest, in which the USFS will not issue new special use permits;
- Land within 0.25 miles of developed or semi-developed recreation sites, per the Newcastle RMP;

- Black Elk Wilderness and Inyan Kara Mountain, both of which are listed as “very high” in terms of scenic integrity objectives; and
- TBNG Category 1 and Category 2 lands, on which the USFS prohibits developing new utility corridors or additional development in existing utility corridors.

8.1.2 High Sensitivity Areas

High sensitivity areas include lands that feature unique, highly-valued, or complex resources and lands that should be avoided. Such areas include scenic corridors and byways, important viewsheds and vistas, pockets of grasslands in TBNG’s boundary, and tribal government lands. More specifically, high sensitivity areas include:

- BHNF’s Late Successional Forest Landscape, across which the USFS does not seek to permit transmission corridors that might alter significant areas of vegetation;
- The 9,000-acre Pilger Mountain area, where no additional roads will be permitted;
- The 10,703-acre Spearfish Canyon, which features a scenic byway;
- Travel corridors in general, subject to BHNF LRMP Objective 5612, which states that “power lines...should not be noticeable features within travel corridors”;
- The 12,400-acre Sand Creek Area, which is essentially undeveloped and accommodates late successional forest conditions;
- Jewell Cave and Wind Cave, both of which are part of the National Park System;
- TBNG’s Broken Hills geographic area, which the USFS seeks to manage so as to reveal little evidence of human influence or activity;
- TBNG’s Cellars-Rosecrans geographic area, in which the USFS seeks to maintain grasslands and coniferous and hardwood trees;
- TBNG’s Spring Creek geographic area, in which the USFS seeks to maintain primitive conditions;
- TBNG’s Upton Osage geographic area, in which the USFS seeks to provide camping and picnicking opportunities;
- Lands available for oil and gas leasing, subject to CSU, NSO, Timing Limitations, and other lease stipulations. Per TBNG staff, the project team should consider routing the proposed transmission line parallel to the existing transmission corridor north of Teckla to avoid coal operations;
- Community facilities, including churches, community centers, daycare centers, hospitals, libraries, medical clinics, parks and recreational facilities, schools, and senior care centers;
- Light commercial developments, including banks, gas stations/convenience stores, grocery stores, restaurants, and shops; and
- Residential neighborhoods in cities, towns, and villages, and in unincorporated portions of the project area.

8.1.3 Moderate Sensitivity Areas

Moderate sensitivity areas are considered important, valued, or otherwise assigned a special status. Moderate sensitivity areas include:

- TBNG’s Fairview-Clareton and Hilight Bill geographic areas, in which the USFS seeks to promote livestock grazing and mineral exploration and development;

- Grazing allotments, including Thunder Basin grazing in Douglas, Wyoming and Inyan Kara grazing in Newcastle, Wyoming;
- TBNG Category 3 lands, on which the USFS allows new utilities to be located along road corridors or in other areas that are already disturbed;
- TBNG Category 4 lands, on which the USFS allows utility corridors, only if the corridors do not degrade the character for which the area was managed or designated;
- Proposed extensions for the Dakota, Minnesota and Eastern Railroad; and
- The Canadian Pacific Railroad.

8.1.4 Low Sensitivity Areas

Low sensitivity areas are those areas that have a low probability of being impacted by the proposed transmission line. Low sensitivity areas include:

- Heavy commercial and industrial developments, including manufacturing and distribution facilities, and warehouses;
- TBNG Category 5 lands, which often display high levels of investment, use, activity, and vegetative manipulation; and
- TBNG Category 6, Category 7, and Category 8 lands, all of which display high levels of development, private and public use, and existing environmental degradation.

8.1.5 Summary

For purposes of identifying alternative routes for the proposed transmission line, it is more important to combine BHNF and TBNG staff concerns with USFS policies in the exclusion areas and high sensitivity areas, than to concentrate on the moderate and low sensitivity areas. More specifically, during the October 27 and October 28, 2009 project introduction meetings, BHNF and TBNG staff discussed the need for the project to use existing access roads as much as possible. BHNF staff encouraged the project team to use BHP's vacated 69 kV right-of-way as much as possible, and to be mindful that a proposed trail might be situated in the area of this right-of-way. TBNG staff prefers routing the proposed transmission line along State Highway 450, though they acknowledged that existing facilities along this corridor might not be able to accommodate the new transmission line. To add to the exclusion areas and high sensitivity areas above, key USFS policies for routing the proposed transmission line focus on minimizing visual impacts along scenic corridors, consolidating utility lines within existing utility corridors, and collocating roads and utility lines to minimize disturbance.

8.2 Visual Resources

This section describes the siting criteria used to identify sensitive areas for visual resources in the study area. For the purpose of this study, the agency visual management classes were used as primary siting criteria for the transmission line. Class I Visual Resource Management and Very High Scenic Quality Objective designations are typically assigned in Wilderness Areas, Wilderness Study Areas, Areas of Critical Environmental Concern, etc., and therefore would typically preclude transmission line siting. These are generally the most valued and rare landscapes. Table 3 summarizes the rationale for assigned sensitivity levels.

TABLE 3 VISUAL RESOURCE SENSITIVITY RATING TABLE: AGENCY MANAGEMENT OBJECTIVES			
AGENCY OBJECTIVES			
SENSITIVITY LEVEL	FS SCENIC INTEGRITY OBJECTIVE	BLM VISUAL RESOURCE MANAGEMENT CLASS	SENSITIVITY RATIONALE
EXCLUSION	Very High	I	Rare, unique, pristine, very high quality landscapes, or landscapes protected by legislation or from most forms of development due to agency management policies for visual resources. Project construction in these areas will, under no circumstances, be compatible with current agency visual objectives, will require a plan amendment for project construction, and has a low probability of approval.
HIGH	High	II	High Quality, somewhat rare landscapes precluded from many forms of development due to agency management policies for visual resources. Project construction in these areas will not be compatible with current agency visual objectives, will require a plan amendment for project construction, and has an uncertain probability of approval. Basic visual changes may be seen, but should not be evident. Visual influence of the project in these areas are expected to be moderately high to high.
MODERATE	Moderate	III	Moderate quality, somewhat common landscapes not precluded from development, but where project may not conform to agency management policies for visual resources. Project construction in these areas may be compatible with current agency visual objectives, will not likely require a plan amendment for project construction, and has a moderate probability of approval. Changes may occur, but they must be subordinate to the overall landscape. Visual influence of the project in these areas are expected to be moderate to low.
LOW	Low and Very Low	IV	Lowest quality, most common or most developed landscapes where development is allowed, directed, or routinely permitted; and where deviation from landscape character may be dominant.

Lands adjacent to high density parcel sections (residential); Forest Service major road and trail corridors; Forest Service developed recreation sites; Forest Service administrative sites; National and State Historic and Scenic trails; and National and State Scenic Highways, Byways and Railways would be considered high sensitivity areas.

8.2.1 Summary Results

8.2.1.1 Agency Management Classes

The BLM Visual Resource Management classes in the study area include Class II, III and IV. An area along the Wyoming state border east of Newcastle is designated as a Stateline Special Recreation Management Area. In addition, the study area's most restrictive visual resource management class (Class II) lies in this management area. The designation of the Stateline Special Recreation Management Area makes this a high sensitivity area.

The USFS Scenic Integrity Objectives for the BHNF lists the Black Elk Wilderness and as very high, making this an exclusion area. The Black Elk Wilderness, which includes the Upper Pine Creek Research Natural Area, is located between South Dakota State Highways 244 and 87.

The BHNF management areas with high and moderate Scenic Integrity Objectives are listed in Table 4. The areas identified in Table 4 as high are exclusion areas and the areas identified as moderate are avoidance areas or moderate sensitivity areas for visual resources.

TABLE 4 BLACK HILLS NATIONAL FOREST MANAGEMENT AREAS THAT HAVE HIGH AND MODERATE SCENIC INTEGRITY OBJECTIVES WITHIN THE STUDY AREA			
MANGEMENT AREAS	NAME	HIGH ACRES	MODERATE ACRES
2.2	Research Natural Areas	2,277	0
3.1	Botanical Areas	7,348	0
3.31	Back Country Motorized Recreation Emphasis	1,126	10,577
3.32	Back Country Non-Motorized Recreation Emphasis	11,563	0
3.7	Late Successional Forest Landscapes	3,397	12,508
4.1	Limited Motorized Use and Forest Product Emphasis	6,722	23,097
5.1	Resource Production Emphasis	58,130	247,384
5.1A	Southern Hills Forest and Grassland Areas	1,796	17,208
5.2A	Fort Meade VA Hospital Watershed	3,308	0
5.4	Big Game Winter Range Emphasis	50,626	163,454
5.43	Big Game and Resource Production	276	6,520
5.6	Forest Products, Recreation and Big Game Emphasis	1,378	19,539
8.2	Developed Recreation Complexes	6,908	3,726
Source: BHNF Land and Resource Management Plan Phase II Amendment 1997			

In the TBNG there are five areas with a high Scenic Integrity Objective within the study area. All other areas within the study area have a Scenic Integrity Objective of moderate or low. One area with a high Scenic Integrity Objective is located approximately 4.5 miles west of Wyoming State Highway 116 in the northern portion of the study area. A cluster of three highly rated areas are located approximately 4.5 miles west of Wyoming State Highway 116 and approximately 3.5 miles north of Wyoming State Highway 450. A small portion of another highly rated area lies within the study area

and it is located in the northeastern corner of Converse County. The five high Scenic Integrity Objective areas in TBNG are exclusion areas.

8.2.1.2 National and State Scenic and Historic Trails

The only scenic and historic trails in the study area are two state designated historic trails: The Texas Trail and The Cheyenne – Deadwood Stage Road. Both trails run north – south along the eastern edge of Wyoming.

The Texas Trail entered Wyoming where the town of Pine Bluffs now sits. It extended north through eastern Wyoming on a line parallel to today's US 85, connecting to the current I-90 corridor at Moorcroft, then up the Little Powder River into Montana. Much of the Texas trail paralleled the Cheyenne-Deadwood Stage Route.

The Cheyenne – Deadwood State Road ran between Cheyenne, Wyoming and Deadwood, South Dakota, crossing the state border just north of Newcastle, Wyoming. The trail is marked by monuments and information signs at intersections with public roads. Most of the actual trail is on private land, but much of the route is paralleled by improved county and state roads.

The corridors for The Texas Trail and The Cheyenne – Deadwood Stage Road are high sensitivity areas.

8.2.1.3 National and State Scenic, Historic and Back Country Highways, Byways and Railways

The Peter Norbeck Scenic Byway is designated as a National and State Scenic Byway and as a National Forest Scenic Byway. It includes South Dakota State Highways 244 and 87 and portions of US Highways 16 and 16A. The northern most section of the Peter Norbeck Scenic Byway is in the study area, located just south of the South Dakota towns of Hill City and Keystone.

A South Dakota Scenic Railway, the 1880 Sight Seeing Train, is in the study area and runs between the towns of Hill City and Keystone, South Dakota, just north of the Mount Rushmore National Memorial.

The Peter Norbeck Scenic Byway and 1880 Sight Seeing Train are high sensitivity corridors.

8.3 Cultural Resources

During the October 27 and October 28, 2009 project introduction meetings, BBNF and TBNG staff discussed sensitive view shed issues associated with the Inyan Kara Mountain Traditional Cultural Property (TCP). This TCP is located outside the Project study area. Staff also discussed the sensitivity of the Buffalo Divide and Cellars Special Interest Areas (SIA). TBNG provided locations of both SIAs in GIS. The Cellars SIA is located within a greater sage grouse core area, and has been avoided. The Buffalo Divide SIA has been avoided and is not near any proposed alternative corridors.

Cultural resources are protected by Federal and State laws if they are found to have some level of significance under the criteria of the NRHP or under State guidance. Under Section 106 of the

National Historic Preservation Act (NHPA), an undertaking such as construction of a transmission line on Federal Land, results in adverse effects to a cultural resource listed in or eligible to the NRHP when it alters the resource's characteristics, including relevant features of its environment or use, that qualify it for inclusion in the NRHP. Potential impacts could include:

- Physical destruction, damage, or alteration of all or part of the property;
- Isolation of the property from, or alteration of the character of the property's setting when that character contributes to the property's qualification to the NRHP;
- Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;
- Neglect of a property resulting in its deterioration or destruction, and
- Transfer, lease, or sale of the property.

It is anticipated that potential effects of a transmission line on cultural resources would generally be related to either physical damage (e.g., ground disturbance at an archaeological site, demolition of a historic cabin) or changes in the visual setting (e.g., a transmission line disrupting the view of a historic ranch). Physical disturbance could potentially be an adverse effect for all three classes of cultural resources. A change in visual setting can potentially be a major adverse effect for NRHP-listed or eligible architectural resources and for Native American sacred sites, but is usually not a consideration for most archaeological sites because their NRHP eligibility is more often tied to scientific importance than to setting.

8.4 Biological Resources

Sensitivity ratings were assigned to 27 individual biological resources within the study area. These ratings were based upon a relative evaluation of the resource's legal status as a USFWS ESA federally protected species, state protected species, USFS R2 special status species, or specifically addressed in the Resource Management Plans of the BHNH and TBNG. Four resources are designated as exclusion in the study area: Greater sage grouse leks, prairie dog towns containing black-footed ferrets, Sharp-tailed grouse leks, and mountain plover nests. At this time, there is not an extant population of black-footed ferret on within the study area. However, the TBNG is slated to receive individuals for reintroduction efforts in the fall of 2010 (A. Ormseth, *pers. comm.*). In addition to yearlong restrictions, sharp-tailed grouse leks, mountain plover nests, bald eagle nests, and golden eagle nests all also have seasonal restrictions at varying buffers surrounding nests.

Federally threatened and endangered plant species, USFS designated botanical areas and research natural areas, and greater sage grouse core areas were designated as high sensitivity because these resources should be avoided but could either be spanned or avoided by a transmission line. The nests of varying R2 sensitive raptor species were designated as high sensitivity because of requirements stipulated by the MBTA, BGEPA, and corresponding Forest Plans. Table 5 summarizes the rationale for assigned sensitivity levels for all resources that may be carried forward to the NEPA phase of the project.

TABLE 5 BIOLOGICAL RESOURCES SENSITIVITY

RESOURCE COMPONENT	SENSITIVITY				RATIONALE
	EXCLUSION	HIGH	MODERATE	LOW	
Federal Threatened and Endangered plant species (avoid construction within 0.25 mile buffer of extant occurrences and construction avoided in potential suitable habitats; possibly more criteria depending on species after consultation with USFWS)		•			Federally listed species have statutory protection pursuant to the Endangered Species Act.
USFS R2, TBNG, and BHNF Species of Local Concern, and BLM Sensitive species (construction prohibited at occurrences and potential suitable habitats)			•		USFS and BLM management plans provide for protection of sensitive species and their habitats.
Riparian and wetland habitats (new road construction prohibited within 400 feet of meadows where topography allows; and construction avoided by spanning riparian habitats)			•		Riparian habitats support a number of federally listed and USFS sensitive species (i.e., bald eagle nests and roosts).
Botanical Areas and Research Natural Areas (aimed to protect unique botanical flora. No new roads may be constructed)		•			Specially designated management areas designated by TBNG and BHNF.
Swift fox dens (construction seasonally prohibited within ¼ mile buffer during March 1 to August 31)		•			USFS sensitive species. Criteria based on TBNG and BHNF Plans.
Greater sage grouse leks (<u>construction prohibited year-round within 1/2 mile</u> buffer; and seasonally prohibited within 2 miles during March 1 to June 15)	•				USFWS ESA Candidate Species, and USFS sensitive species. Criteria based on TBNG and BHNF Plans and Executive Order 2008-2: Greater Sage Grouse Core Area Protection and Stipulations for Development in Core Sage Grouse Population Areas
Greater sage grouse core areas (new ROW to be placed parallel and adjacent to existing ROW)		•			Executive Order 2010-4: Greater Sage Grouse Core Area Protection and Stipulations for Development in Core Sage Grouse Population Areas
Sharp-tailed grouse leks (<u>construction prohibited year-round within ¼ mile</u> buffer; and seasonally prohibited within 1 mile during March 1 to June 15)	•				USFS sensitive species. Criteria based on TBNG and BHNF Plans.

TABLE 5 BIOLOGICAL RESOURCES SENSITIVITY

RESOURCE COMPONENT	SENSITIVITY				RATIONALE
	EXCLUSION	HIGH	MODERATE	LOW	
Mountain plover nests and nesting areas (<i>construction prohibited year-round within ¼ mile</i> buffer; and seasonally prohibited within ¼ mile during March 15 to July 31)	•				USFWS Species of Concern and USFS sensitive species. Criteria based on TBNG and BHNH Plans.
Bat day and night roost areas and wintering sites (vegetative changes within 500 feet of the opening are prohibited)			•		USFS sensitive species. Criteria based on TBNG and BHNH Plans.
Prairie dogs (avoid and minimize new road construction through all prairie dog colonies; construction prohibited seasonally March 1 to August 31 within prairie dog colonies occupied or thought to be occupied by black-footed ferrets)	•				USFWS Species of Concern and USFS sensitive species. Criteria based on TBNG and BHNH Plans.
Bald eagles (construction prohibited 1 mile from active nests and winter roost area in Wyoming; and seasonally prohibited in both states within 1 mile of active nests during January 1 to September 1 and of winter roost area during November 1 to April 1)		•			USFWS Species of Concern and USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Golden eagles (construction prohibited 0.25 mile from active nests; and seasonally prohibited within 0.5 mile of active nests during January 15 to July 31)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Merlins (construction prohibited 0.25 mile from active nests; and seasonally prohibited within 0.5 mile of active nests during April 1 to August 15)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Ferruginous hawks (construction prohibited 0.25 mile from active nests; and seasonally prohibited within 1 mile of active nests during March 1 to July 31)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Northern goshawks (construction seasonally prohibited within 0.5 mile of active nests during April 1 to August 15)		•			USFS sensitive species. Criteria based on BHNH Plan; and WY USFWS guidelines.
Swainson's hawks (construction prohibited 0.25 mile from active nests; and seasonally prohibited within 0.5 mile of active nests during March 1 to August 31)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.

TABLE 5 BIOLOGICAL RESOURCES SENSITIVITY

RESOURCE COMPONENT	SENSITIVITY				RATIONALE
	EXCLUSION	HIGH	MODERATE	LOW	
Burrowing owls (construction prohibited 0.25 mile from active nests; and seasonally prohibited within 0.25 mile of active nests during April 1 to September 15)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Peregrine falcons (construction seasonally prohibited within 0.5 mile of active nests during March 1 to August 15)		•			USFS sensitive species. Criteria based on TBNG and BHNH Plans; and WY USFWS guidelines.
Prairie falcons construction seasonally prohibited within 0.5 mile of active nests during March 1 to August 15)			•		Criteria based on WY USFWS guidelines.
Short-eared owl (construction seasonally prohibited within 0.25 mile of active nests during March 15 to August 1)			•		Criteria based on WY USFWS guidelines.
Other raptors (construction prohibited 0.125 mile from active nests; and seasonally prohibited within 0.125 mile of active nests during February 1 to September 15)		•			USFS sensitive species. Criteria based on TBNG Plan; and WY USFWS guidelines.
Snail colonies (avoid construction at known occurrences of sensitive snail species or species of local concern)			•		USFS sensitive species. Criteria based on BHNH Plan.
Red-bellied snakes (avoid new road construction between hibernacula and wetlands)			•		USFS sensitive species. Criteria based on BHNH Plan.
Big game Migratory Routes (Antelope, Mule Deer, White-tailed Deer)			•		Routes designated by the Wyoming Game and Fish Department
Big game Crucial Range (Mule Deer, White-tailed Deer, Elk; crucial seasonal ranges designated in an effort to limit human disturbance in important areas at important times)			•		Range designated by the Wyoming Game and Fish Department
Big game Parturition Areas (Elk; areas of seasonally high concentrations of birthing animals designated in an effort to limit human disturbance)			•		Areas designated by the Wyoming Game and Fish Department.

8.5 Water Resources

Sensitivity criteria were developed to reflect the sensitivity of water resources relative to the identification of transmission line corridors. The primary objective during the corridor selection phase is to minimize the number of stream, river, and lake crossings, identify significant

floodplains, and exclude portions of lakes, reservoirs, or rivers that exceed allowable span widths. Federal, state, and local regulations regarding water resources would be addressed during the project design phase.

Freshwater wetlands are protected from fill/disturbance pursuant to Section 404 of the CWA. Wetlands can also provide important habitat for a variety of special status plant and wildlife species, and may present engineering constraints. However, wetlands are typically assessed during transmission line design and are spanned or avoided.

Floodplains represent a potential hazard for transmission line siting. There are no legal statues, aside from local floodplain ordinances, prohibiting the placement of transmission line structures in regulated floodplains. Construction in these areas could create severe engineering constraints and result in significant adverse environmental impacts. Specific flood elevations and migration of stream channels are also assessed during transmission line design and permitting.

Table 6 identifies the sensitivity designations for each of the water resource components that are evaluated in this study. This table also summarizes the rationale for the designation.

TABLE 6 SENSITIVITY RATINGS FOR WATER RESOURCES AND WETLANDS					
RESOURCE COMPONENT	SENSITIVITY				RATIONALE
	EXCLUSION	HIGH	MODERATE	LOW	
Lakes/Reservoirs/Rivers	•				Water bodies that exceed transmission line span lengths.
Lakes/Reservoirs/Rivers				•	Water bodies that can be spanned by transmission line.
Wetlands with threatened and endangered species habitat	•				Legally protected by the Endangered Species Act of 1973.
Wetlands: forested and scrub/shrub		•			Legally protected, potential for engineering constraints, and clearing of ROW vegetation required.
Wetlands: emergent and open water			•		Legally protected and potential for engineering constraints; can typically span.
100-Year Floodplains			•		Potential for engineering constraints and adverse impacts; can typically span.

8.5.1 Summary Results

8.5.1.1 Surface Water

There are eight major watersheds (USGS 8th level hydrologic unit) within the study area. Three watersheds are exclusive to Wyoming: the Antelope; Upper Belle Fourche, and Upper Cheyenne. Two watersheds reside in both Wyoming and South Dakota: the Beaver and Red Water. Three watersheds are exclusive to South Dakota: Middle Cheyenne-Elk; Middle Cheyenne-Spring; and Rapid. Each watershed contains numerous streams and small lakes/reservoirs. Table 7 shows the type and quantity of surface water resources in the study area.

TABLE 7 SURFACE WATER RESOURCES IN THE STUDY AREA

SURFACE WATER TYPE	QUANTITIY
Lakes/Reservoirs	1,840 acres
Perennial (named) rivers and streams	2,358 miles
Intermittent (unnamed) rivers and streams	12,777 miles
Source: National Wetland Inventory, USGS National Hydrologic Database	

There is only one river in the Wyoming study area: the Belle Fourche River located in the northwestern portion of the study area. There are no major lakes or reservoirs in the Wyoming portion of the study area.

There are no major rivers in the South Dakota portion of the project. The most significant water courses are three perennial streams: Boxelder Creek, Rapid Creek and Spring Creek. They flow from west to east and are roughly parallel to each other on the eastern portion of the study area; although, Rapid Creek flows across nearly the entire west-east length of the study area. There are three major lakes/reservoirs in the study area: Deerfield Lake, Sheridan Lake, and Pactola Reservoir. These three lakes/reservoirs are all within the BHNF.

The rivers, streams, and small lakes within the study area are low sensitivity areas. The three lakes/reservoirs in South Dakota have both exclusion areas and low sensitivity areas. The size of the main body of water is large enough to be an exclusion area, but there are smaller arms of each lake/reservoir that could be spanned which are low sensitivity areas.

8.5.1.2 Wetlands

The NWI identifies three wetland systems occurring within the project area: lacustrine, palustrine, and riverine. The lacustrine system includes wetlands and deepwater habitats lacking vegetation with greater than 30 percent aerial coverage and total area greater than 20 acres. The palustrine system includes all non-tidal wetlands dominated by vegetation and small, shallow, permanent or intermittent ponds. The riverine system includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts in excess of 0.5 ‰.

The palustrine wetlands are the most common in the study area as shown in Table 8. Palustrine emergent wetlands are the most numerous and cover the greatest acreage in the study area at 7,601

acres. The palustrine aquatic bed wetlands are the second most numerous in the study area covering 2,282 acres.

TABLE 8 WETLAND RESOURCES IN THE STUDY AREA

WETLAND TYPE	GENERAL DEFINITION	TOTAL ACRES
L1UB	Lacustrine – unconsolidated bottom	1,757
L2AB	Lacustrine – aquatic bed	83
L2US	Lacustrine – unconsolidated shore	134
PAB	Palustrine – aquatic bed	2,282
PEM	Palustrine – emergent wetland	7,601
PFO	Palustrine – forested wetland	29
PSS	Palustrine – scrub-shrub wetland	201
PUB	Palustrine – unconsolidated bottom	103
PUS	Palustrine – unconsolidated shore	359
R2	Riverine – lower perennial	3.7
R3	Riverine – upper perennial	2.3
R4	Riverine – intermittent	458
Source: National Wetlands Inventory		

Wetlands occur throughout the study area. In Wyoming, larger wetland areas are primarily associated with the perennial and larger perennial and intermittent stream corridors including: Belle Fourche Creek, Black Thunder Creek, Lodgepole Creek, Upper Beaver Creek, Oil Creek, and Beaver Creek. In South Dakota, larger wetland areas are primarily associated with the three larger perennial stream corridors: Boxelder Creek, Rapid Creek and Spring Creek. There are no major wetland complexes in the study area.

Although the palustrine forested and palustrine scrub-shrub wetlands are scattered throughout the study area, there are four main areas where these wetlands are concentrated. Two of these wetland clusters are located in Wyoming: Oil Creek west of U.S. Highway 85 and north of U.S. Highway 16 and Beaver Creek east of U.S. Highway 85. The other two clusters are in South Dakota: South Fork Rapid Creek northeast of Deerfield Lake and west of U.S. Highway 385 and Rapid Creek on the eastern edge of the study area between South Dakota State Highways 79 and 44.

Some of the wetlands in the study area may have threatened and endangered species residing in them, such as the Ute Ladies Tresses or Western Prairie Fringe Orchid, which would make the specific wetland an exclusion area. The palustrine forested wetlands and palustrine scrub-shrub wetlands cover a relatively small area in terms of acreage, but are high sensitivity areas. All the other wetland types are moderate sensitivity areas.

8.5.1.3 Floodplains

The Federal Emergency Management Agency has identified 100-year floodplain zones in the South Dakota portion of the study area and they are associated with the Upper Elk Creek, Boxelder Creek, Rapid Creek, and Spring Creek. The majority of the 100-year floodplain zones are located on the most eastern portion of the study area, east of Interstate 90 and South Dakota State Highway 16.

Although floodplain data for Wyoming was not in a readily usable format for this report, the small number of perennial rivers and streams indicates a low number of 100-year floodplains of significance.

All of the 100-year floodplains are moderate sensitivity areas.

9.0 OPPORTUNITIES AND CONSTRAINTS

In order to identify potential locations for project facilities, information gathered during the data inventory was used to determine corridor and routing constraints and opportunities within the study area. The approach used to identify these opportunities and constraints are presented below.

For the purposes of this study, environmental constraints and opportunities were defined based on a sensitivity analysis for each environmental resource as previously described. Sensitivity was defined as a measure of the probable adverse response of each resource to direct and indirect impacts associated with the construction, operation, maintenance and abandonment of the transmission line.

Tables were developed that assigned levels of sensitivity and constraint specific to different resource features. These tables, in turn, provide the guidelines necessary to assign classifications to the inventoried information. Once assigned, GIS was utilized to reclassify information and map sensitivity and constraint levels for each of the environmental resources inventoried within the segments. Results from specific resource sensitivity and constraints analyses, including descriptions and tables may be found in Section 8.0 above. Having identified individual resource constraints, a summary of sensitivity constraints was made for environmental resources, and the GIS was used to create a composite environmental constraints map. This map served to identify potential overall levels of environmental constraint for the location of project facilities.

Environmental constraints and opportunities were determined based on information gleaned from inventoried data including agency management plans and through internal review and discussions with the project team. The review of this information and results from this discussion were used to initially identify specific issues associated with the study area and later to characterize the constraints or opportunities associated with potential alternatives.

For the purpose of the Project, siting opportunities and areas of low sensitivity were generally in areas of existing linear facilities, where available, including corridors that have been previously disturbed or have been designated for use as utility corridors. Typically, these opportunity areas were located near existing transmission lines, in previous transmission line corridors, major transportation corridors, railroads, section lines and previously disturbed areas.

For the purpose of the Project, siting constraints and areas of high sensitivity generally include active and future mine leases, greater sage grouse core areas and other areas considered highly sensitive.

10.0 ALTERNATIVE CORRIDOR IDENTIFICATION

After inventorying resources and defining sensitivities within the study area, potential transmission line corridors were identified.

As a first step to identifying corridors, potential alternatives were reviewed based upon their ability to maximize the use of areas of opportunity while avoiding areas of higher environmental constraint. Corridors were identified on an overlay of the composite environmental sensitivity map. Areas of opportunity were identified based on the composite sensitivity, with priority given to geographical areas that provided highest opportunity (lowest constraint) in corridors between existing substations on the east and west ends of the project. Corridors were further refined using existing aerial photography in conjunction with the composite constraints overlay.

A total of 25 alternative corridors were identified during the alternative corridor identification phase of the Project. These consist of links within the corridors for routing the proposed transmission line. Superior corridors were chosen from the routing options and incorporated into the final Project alternatives. One link, Link 10, was eliminated from further consideration based on its potential unmitigable impacts to greater sage grouse core areas. Table 9 contains a summary comparison of all 25 alternative corridors.

TABLE 9 TRANSMISSION LINE ALTERNATIVE COMPARISON											
ROUTE ID	LINKS	ROUTE LENGTH (MILES)	WETLANDS CROSSED (ACRES WITHIN 1 MILE CORRIDOR)	NAMED STREAM CROSSINGS	SAGE GROUSE CORE AREA CROSSED (MILES)	MINING OPERATION CROSSED (MILES)	PARALLEL EXISTING TRANSMISSION LINES (MILES)	MILES OF EXISTING ACCESS ROADS WITHIN CORRIDOR (EXCLUDING FEDERAL AND STATE HWY)	FORESTED ACRES (125 FT. BUFFER)	MILES OF ABANDONED TRANSMISSION LINE ROW	COMMENTS
A	5, 6, 10, 14, 20, 25, 27, 28, 33	143.08	413.98	54	17.66	1.40	27.12	401.80	502.33		17 miles of sage grouse core area
B	5, 6, 11, 13, 14, 19, 21, 24, 35, 25, 27, 28, 33	149.29	779.97	63	3.72	1.40	11.61	413.59	502.12	48.00	Low sage grouse core area, low mining operations crossed, relatively low timber acres, relatively high access, and relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
C	5, 12, 13, 14, 18, 21, 22, 31, 33	157.68	758.83	54	16.38	8.42	24.84	398.64	570.74		17 miles of sage grouse core area
D	5, 6, 10, 14, 20, 35, 34, 31, 33	151.07	414.91	55	17.66	1.40	28.10	422.95	558.43		17 miles of sage grouse core area
E	5, 6, 10, 14, 19, 21, 24, 35, 25, 27, 28, 33	147.01	615.25	63	17.66	1.40	11.86	396.74	506.57		17 miles of sage grouse core area
F	5, 6, 10, 14, 19, 21, 22, 34, 35, 25, 27, 28, 33	147.87	620.16	62	17.66	1.40	14.99	399.69	492.96		17 miles of sage grouse core area
G	5, 6, 10, 14, 19, 21, 22, 31, 33	144.66	620.34	59	17.66	1.40	15.97	388.01	436.14		17 miles of sage grouse core area
H	5, 6, 10, 14, 18, 21, 24, 35, 25, 27, 28, 33	153.29	598.15	64	17.66	1.40	24.61	416.34	627.01		17 miles of sage grouse core area
I	5, 6, 10, 14, 18, 21, 22, 34, 35, 25, 27, 28, 33	154.15	603.06	63	17.66	1.40	27.74	419.29	613.40		17 miles of sage grouse core area

TABLE 9 TRANSMISSION LINE ALTERNATIVE COMPARISON											
ROUTE ID	LINKS	ROUTE LENGTH (MILES)	WETLANDS CROSSED (ACRES WITHIN 1 MILE CORRIDOR)	NAMED STREAM CROSSINGS	SAGE GROUSE CORE AREA CROSSED (MILES)	MINING OPERATION CROSSED (MILES)	PARALLEL EXISTING TRANSMISSION LINES (MILES)	MILES OF EXISTING ACCESS ROADS WITHIN CORRIDOR (EXCLUDING FEDERAL AND STATE HWY)	FORESTED ACRES (125 FT. BUFFER)	MILES OF ABANDONED TRANSMISSION LINE ROW	COMMENTS
J	5, 6, 10, 14, 18, 21, 22, 31, 33	150.94	603.24	60	17.66	1.40	28.73	407.60	556.59		17 miles of sage grouse core area
K	5, 6, 11, 13, 14, 20, 25, 27, 28, 33	145.35	578.70	54	3.72	1.40	26.87	418.65	497.88		Low sage grouse, low mines, relatively high access, relatively low timber timber area, low length
L	5, 6, 11, 13, 14, 20, 35, 34, 31, 33	153.34	579.63	55	3.72	1.40	27.85	439.80	553.99		Relatively high timber area, relatively long length
M	5, 6, 11, 13, 14, 19, 21, 22, 34, 35, 25, 27, 28, 33	150.14	784.88	62	3.72	1.40	14.74	416.54	488.51	48.00	Low sage grouse, relatively low timber area, relatively high access, low mines, relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
N	5, 6, 11, 13, 14, 19, 21, 22, 31, 33	146.93	785.06	59	3.72	1.40	15.72	404.86	431.70	48.00	Low sagegrouse, least timber area, low mines, low length, relatively high access. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
O	5, 6, 11, 13, 14, 18, 21, 24, 35, 25, 27, 28, 33	155.56	762.87	64	3.72	1.40	24.36	433.19	622.56		High timber area, highest stream crossings.
P	5, 6, 11, 13, 14, 18, 21, 22, 34, 35, 25, 27, 28, 33	156.42	767.78	63	3.72	1.40	27.49	436.14	608.96		High timber area, high stream crossing, relatively high length
Q	5, 6, 11, 13, 14, 18, 21, 22, 31, 33	153.21	767.96	60	3.72	1.40	28.48	424.45	552.14		Low sage grouse, low mine area, relatively high access, most miles paralleling existing transmission line.

TABLE 9 TRANSMISSION LINE ALTERNATIVE COMPARISON											
ROUTE ID	LINKS	ROUTE LENGTH (MILES)	WETLANDS CROSSED (ACRES WITHIN 1 MILE CORRIDOR)	NAMED STREAM CROSSINGS	SAGE GROUSE CORE AREA CROSSED (MILES)	MINING OPERATION CROSSED (MILES)	PARALLEL EXISTING TRANSMISSION LINES (MILES)	MILES OF EXISTING ACCESS ROADS WITHIN CORRIDOR (EXCLUDING FEDERAL AND STATE HWY)	FORESTED ACRES (125 FT. BUFFER)	MILES OF ABANDONED TRANSMISSION LINE ROW	COMMENTS
R	5, 12, 13, 14, 20, 25, 27, 28, 33	149.83	569.57	48	16.38	8.42	23.23	392.84	516.48		Relatively low access, relatively high timber area.
S	5, 12, 13, 14, 20, 35, 34, 31, 33	157.81	570.50	49	16.38	8.42	24.21	413.99	572.58		Relatively high forested area, relatively high length.
T	5, 12, 13, 14, 19, 21, 24, 35, 25, 27, 28, 33	153.76	770.84	57	16.38	8.42	7.97	387.78	520.72	48.00	Relatively low timber area, high sage grouse but does so near an existing travel corridor. Relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
U	5, 12, 13, 14, 19, 21, 22, 34, 35, 25, 27, 28, 33	154.62	775.75	56	16.38	8.42	11.10	390.73	507.11	48.00	Relatively low timber area, high sage grouse but does so near an existing travel corridor. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
V	5, 12, 13, 14, 19, 21, 22, 31, 33	151.40	775.92	53	16.38	8.42	12.08	379.05	450.29	48.00	Relatively low timber area, high sage grouse but does so near an existing travel corridor. Relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
W	5, 12, 13, 14, 18, 21, 24, 35, 25, 27, 28, 33	160.04	753.74	58	16.38	8.42	20.72	407.38	641.16		Highest timber area, high length.
X	5, 12, 13, 14, 18, 21, 22, 34, 35, 25, 27, 28, 33	160.89	758.65	57	16.38	8.42	23.85	410.33	627.55		High timber area, high length.

12.0 PRELIMINARY PREFERRED CORRIDOR SELECTION

The preliminary preferred corridors were selected based on several factors including potential environmental impact, land use constraints, and proximity to existing roads and facilities.

A thorough and detailed analysis of the six corridors identified as superior will be conducted in a Proponent's Environmental Report. The results of the Proponent's Environmental Report analysis will select the recommended alternatives that will be reviewed under the National Environmental Policy Act.

Six alternative corridors were identified to have the least constraints. They have been designated as one mile wide corridors to allow for centerline refinement following additional detailed analysis and full ground reconnaissance. The following section describes the general location and configuration of each final alternative corridor. Table 10 contains a summary comparison of the preferred corridors.

TABLE 10 TRANSMISSION LINE ALTERNATIVE COMPARISON – PREFERRED ALTERNATIVES											
ROUTE ID	LINKS	ROUTE LENGTH (MILES)	WETLANDS CROSSED (ACRES WITHIN 1 MILE CORRIDOR)	NAMED STREAM CROSSINGS	SAGE GROUSE CORE AREA CROSSED (MILES)	MINING OPERATION CROSSED (MILES)	PARALLEL EXISTING TRANSMISSION LINES (MILES)	MILES OF EXISTING ACCESS ROADS WITHIN CORRIDOR (EXCLUDING FEDERAL AND STATE HWY)	FORESTED ACRES (125 FT. BUFFER)	MILES OF ABANDONED TRANSMISSION LINE ROW	COMMENTS
B	5, 6, 11, 13, 14, 19, 21, 24, 35, 25, 27, 28, 33	149.29	779.97	63	3.72	1.40	11.61	413.59	502.12	48.00	Low sage grouse core area, low mining operations crossed, relatively low timber acres, relatively high access, relatively low length.Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
K	5, 6, 11, 13, 14, 20, 25, 27, 28, 33	145.35	578.70	54	3.72	1.40	26.87	418.65	497.88		Low sage grouse, low mines, relatively high access, relatively low timber area, low length
M	5, 6, 11, 13, 14, 19, 21, 22, 34, 35, 25, 27, 28, 33	150.14	784.88	62	3.72	1.40	14.74	416.54	488.51	48.00	Low sage grouse, relatively low timber area, relatively high access, low mines, relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
N	5, 6, 11, 13, 14, 19, 21, 22, 31, 33	146.93	785.06	59	3.72	1.40	15.72	404.86	431.70	48.00	Low sage grouse, least timber area, low mines, low length, relatively high access. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.
Q	5, 6, 11, 13, 14, 18, 21, 22, 31, 33	153.21	767.96	60	3.72	1.40	28.48	424.45	552.14		Low sage grouse, low mine area, relatively high access, most miles paralleling existing transmission line.
V	5, 12, 13, 14, 19, 21, 22, 31, 33	151.40	775.92	53	16.38	8.42	12.08	379.05	450.29	48.00	Relatively low timber area, high sage grouse but does so near an existing travel corridor. Relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.

10.1 Corridor B

Corridor B begins at the existing Teckla substation and travels west approximately 3 miles then north approximately 19 miles. Here it turns east and follows county road and section lines until it nears sage grouse core area, where it turns northeast avoiding greater sage grouse core area. The proposed corridor would enter the core area in Township 45 North, Range 67 West, Section 16 on land owned by the state of Wyoming at the core areas narrowest point. The proposed corridor would then angle south-east to parallel a three phase distribution line before heading straight east along the southern section lines of sections 15, 14, 13, and Township 45 North, Range 66 West, Section 18 to where it leaves the core area. Then the corridor would travel east to State Highway 116 where it would parallel highway right of way north approximately 7 miles. At this point, the corridor would travel east approximately 3 miles on a section line and would angle northeast avoiding a greater sage grouse lek, then travel south and east to the existing Osage substation. From the Osage substation, Corridor B travels east and north into Wyoming to the existing Clinton substation and continues east and north to the existing Pactola substation where it utilizes approximately 47 miles of abandoned transmission line ROW. From the Pactola substation, Corridor B turns north for approximately 4 miles then east approximately 3 miles. At this point it turns north approximately 2.5 miles to a point just south of the Pennington county line. Here, it would travel east approximately 5 miles then south to the existing Lange substation. Figures 4 and 5 show examples of the abandoned right of way from Osage Substation to Pactola Substation.

Corridor B was chosen as a preferred alternative due to its low amount of greater sage grouse core area crossed, low amount of current of future mine operations crossed, relatively low amount of timbered acres requiring tree clearing, relatively high amount of existing access roads and its relatively low overall length. This corridor would also utilize approximately 47 miles of an abandoned transmission line ROW, further reducing the amount of tree clearing required for construction.

Figure 4 View of Abandoned Transmission Line ROW

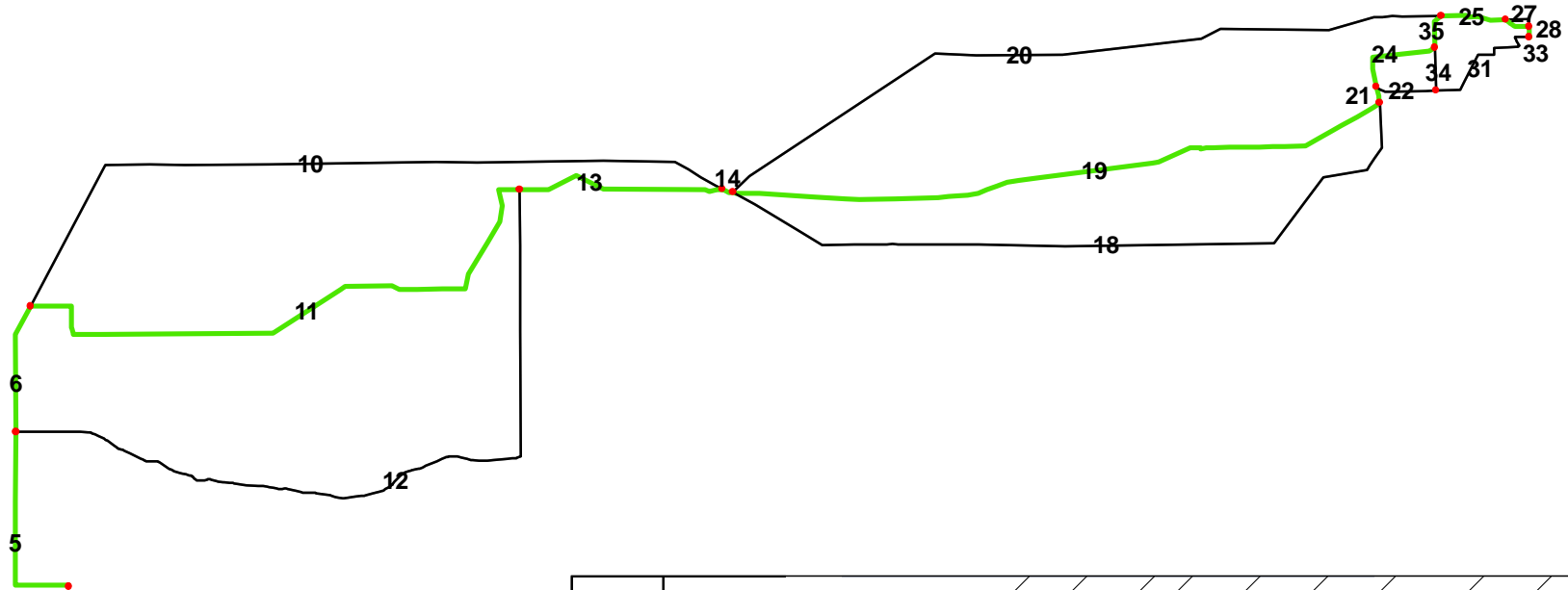


Figure 5 View of Abandoned Transmission Line ROW



Alternative Corridor B

Figure 6



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
B	5, 6, 11, 13, 14, 19, 21, 24, 35, 25, 27, 28, 33	149.29	779.97	63	3.72	1.40	11.61	413.59	502.12	48.00	Low sage grouse core area, low mining operations crossed, relatively low timber acres, relatively high access, relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV/t-line ROW that has been previously cleared.

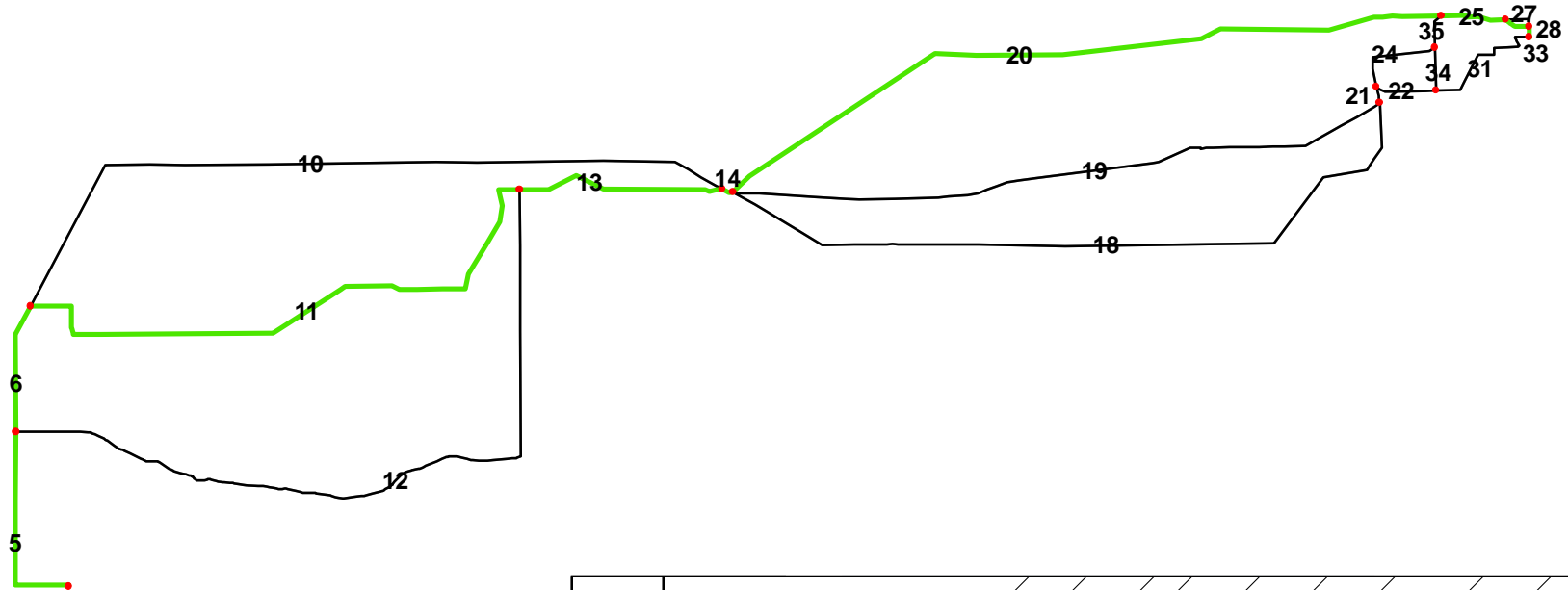
10.2 Corridor K

Corridor K would utilize the same alignment as Corridor B between Teckla Substation and Osage Substation. From Osage Substation, Corridor K would travel north east paralleling an existing transmission line ROW for approximately 26 miles. At this point, the corridor continues in an easterly direction south of the Pennington County line to the Lange Substation.

Corridor K was chosen as a preferred alternative due to its low amount of greater sage grouse core area crossed, low amount of current of future mine operations crossed, relatively low amount of timbered acres requiring tree clearing, relatively high amount of existing access roads and its relatively low overall length. This corridor would also parallel an existing transmission line ROW for approximately 26 miles.

Alternative Corridor K

Figure 7



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
K	5, 6, 11, 13, 14, 20, 25, 27, 28, 33	145.35	578.70	54	3.72	1.40	26.87	418.65	497.88		Low sage grouse, low mines, relatively high access, relatively low timber area, low length

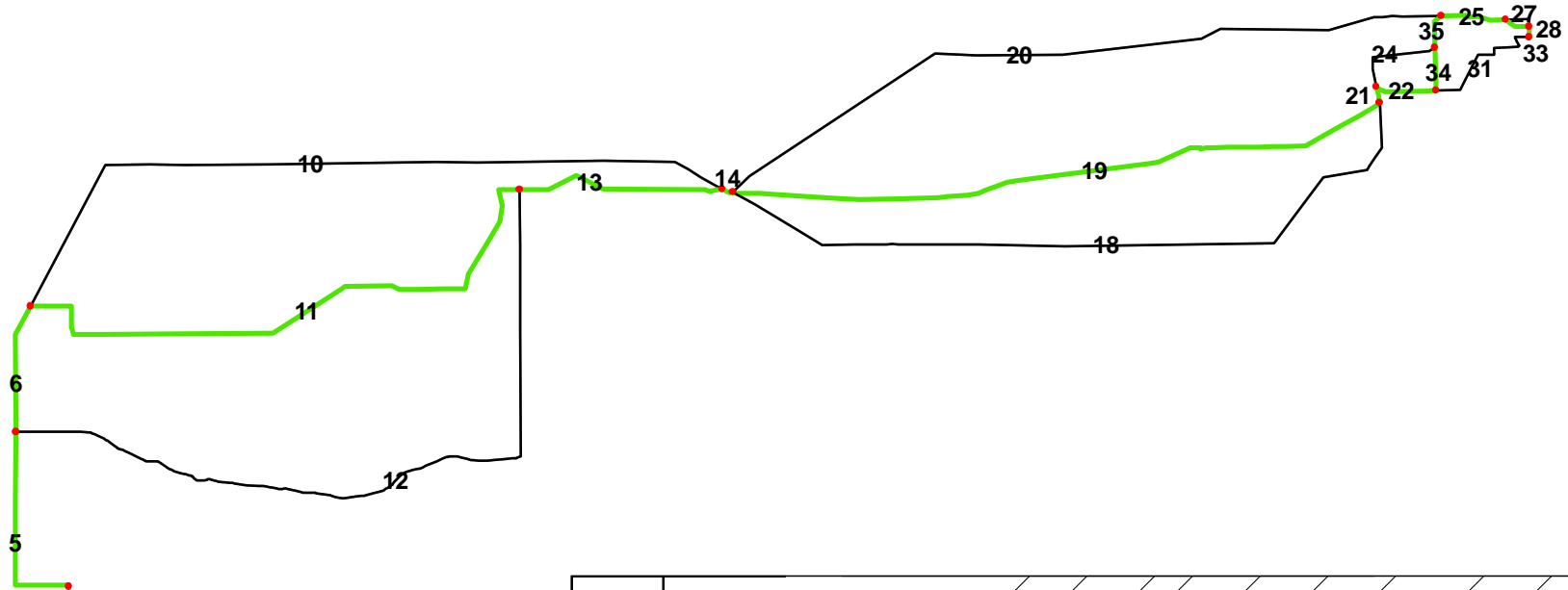
10.3 Corridor M

Corridor M would utilize the same alignment as Corridor B from Teckla substation to Pactola substation. From the Pactola substation, Corridor M continues east approximately 4.5 miles then turns north 5.5 miles to a point just south of the Pennington County line. Here, it would travel east approximately 5 miles then south to the existing Lange substation.

Corridor M was chosen as a preferred alternative due to its low amount of greater sage grouse core area crossed, low amount of current of future mine operations crossed, relatively low amount of timbered acres requiring tree clearing, relatively high amount of existing access roads and its relatively low overall length. This corridor would also utilize approximately 47 miles of an abandoned transmission line ROW, further reducing the amount of tree clearing required for construction.

Alternative Corridor M

Figure 8



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
M	5, 6, 11, 13, 14, 19, 21, 22, 34, 35, 25, 27, 28, 33	150.14	784.88	62	3.72	1.40	14.74	416.54	488.51	48.00	Low sage grouse, relatively low timber area, relatively high access, low mines, relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.

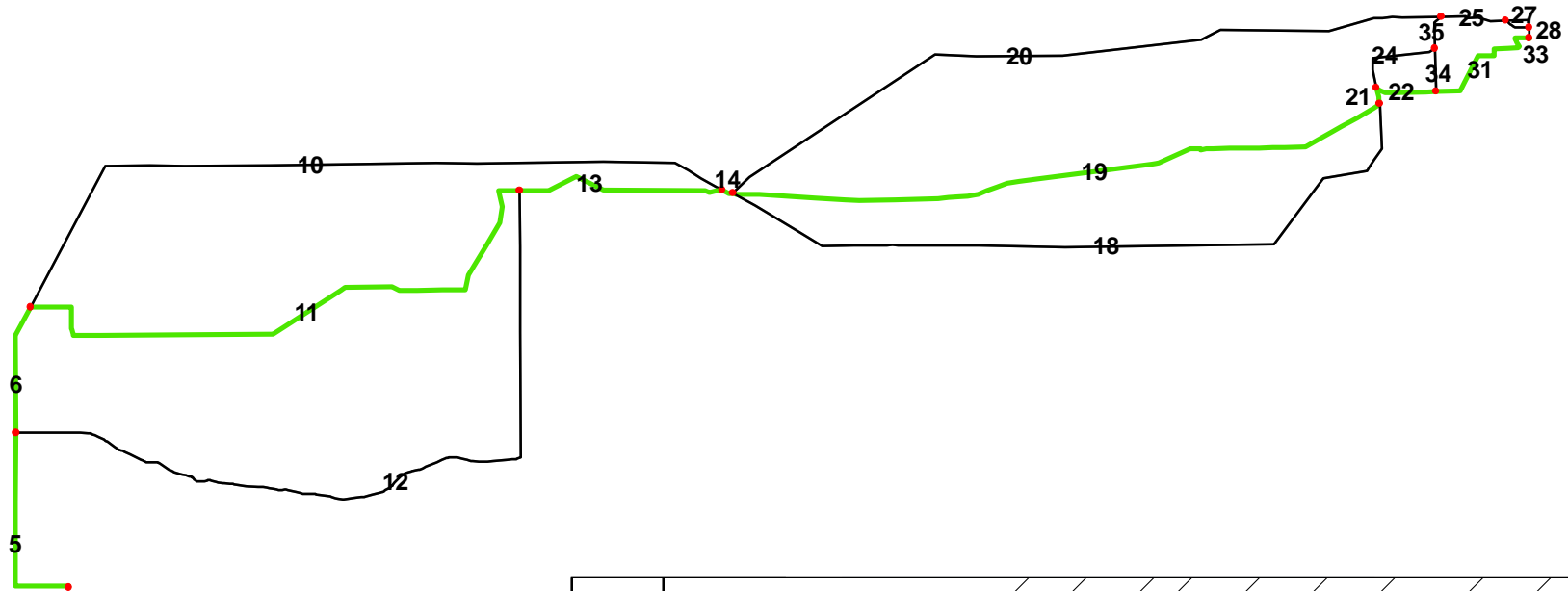
10.4 Corridor N

Corridor N would utilize the same alignment as Corridors B and M from Teckla substation to Pactola substation. From the Pactola substation, Corridor N continues east approximately 5.5 miles and then jogs north and east approximately 10 miles to the Lange substation.

Corridor N was chosen as a preferred alternative due to its low amount of greater sage grouse core area crossed, low amount of current of future mine operations crossed, lowest amount of timbered acres requiring tree clearing, relatively high amount of existing access roads and its relatively low overall length. This corridor would also utilize approximately 47 miles of an abandoned transmission line ROW, further reducing the amount of tree clearing required for construction.

Alternative Corridor N

Figure 9



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
N	5, 6, 11, 13, 14, 19, 21, 22, 31, 33	146.93	785.06	59	3.72	1.40	15.72	404.86	431.70	48.00	Low sage grouse, least timber area, low mines, low length, relatively high access. Approximately 47 miles of this route cross timber area in an abandoned 69 kv t-line ROW that has been previously cleared.

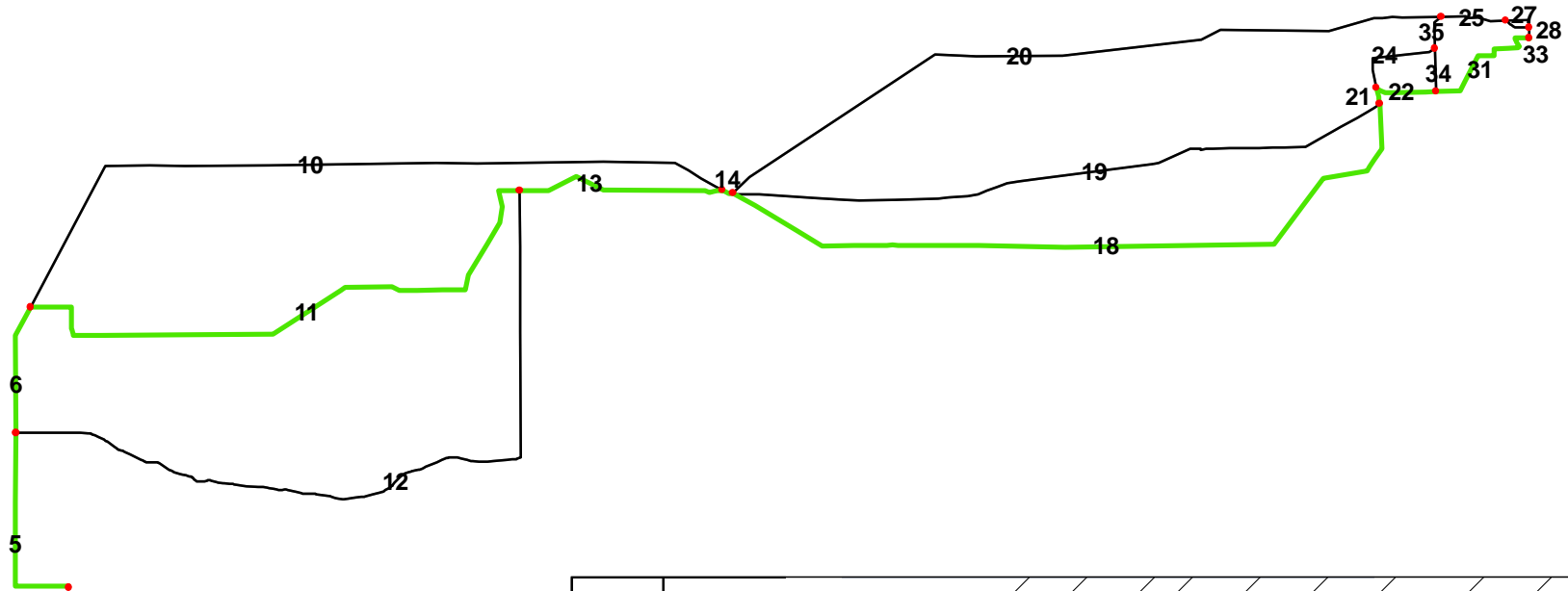
10.5 Corridor Q

Corridor Q would utilize the same alignment as Corridors B, M and N from Teckla substation to Osage Substation. From the Osage substation, Corridor Q continues southeast approximately 7.5 miles paralleling an existing transmission line ROW. At this point the corridor continues east and north approximately 50 miles to the Pactola Substation and then jogs north and east approximately 10 miles to the Lange substation.

Corridor Q was chosen as a preferred alternative due to its low amount of greater sage grouse core area crossed, low amount of current of future mine operations crossed, relatively high amount of existing access roads and it parallels the most amount of existing transmission line corridors.

Alternative Corridor Q

Figure 10



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
Q	5, 6, 11, 13, 14, 18, 21, 22, 31, 33	153.21	767.96	60	3.72	1.40	28.48	424.45	552.14		Low sage grouse, low mine area, relatively high access, most miles paralleling existing transmission line.

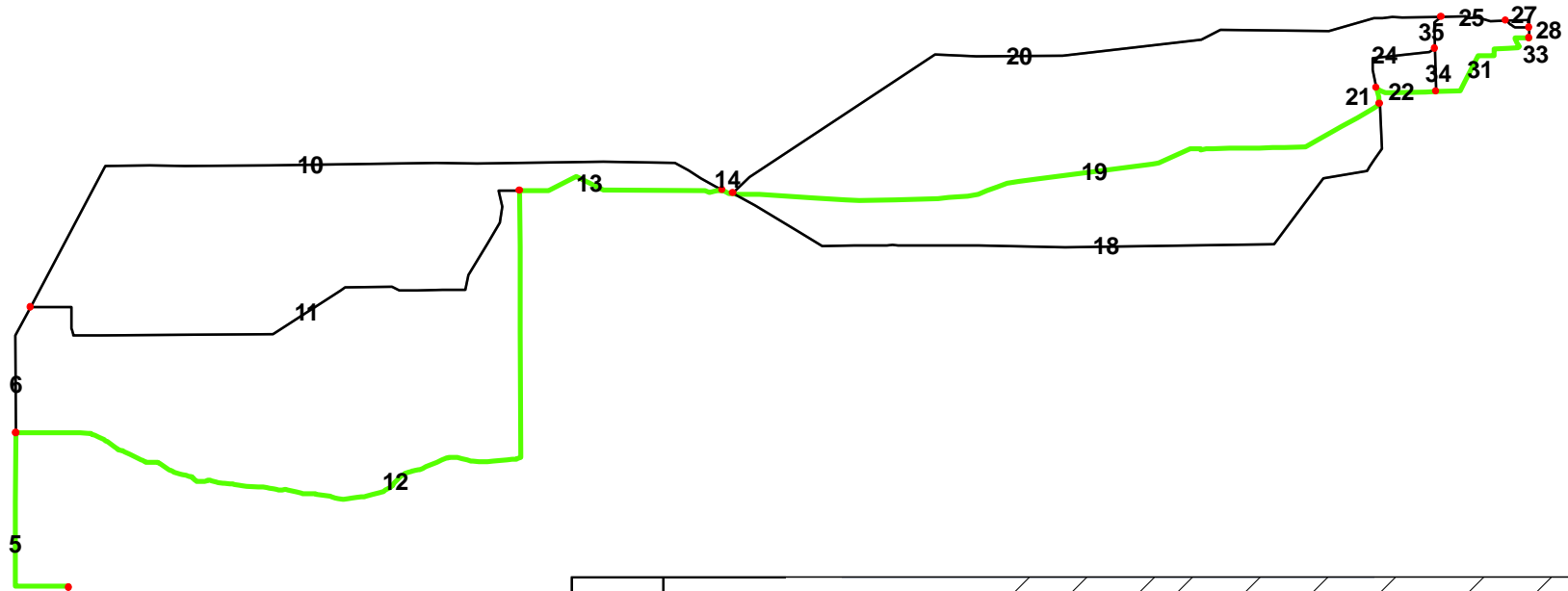
10.6 Corridor V

Corridor V begins at the existing Teckla substation and travels approximately 3 miles west. Here it turns north approximately 11 miles to State Highway 450 then turns east where it parallels approximately 1000 feet north of HWY 450 corridor for approximately 30 miles, crossing approximately 8.5 miles of existing and future coal mine operations. Then it turns north approximately 19 miles where it intersects Corridor B and follows Corridor B into the existing Pactola substation. From the Pactola substation, Corridor V would continue to Lange substation following the same alignment as Corridors N and Q.

Corridor V was chosen as a preferred alternative due to its relatively low amount of timber area requiring clearing and its relatively low length. This corridor would also utilize approximately 47 miles of an abandoned transmission line ROW, further reducing the amount of tree clearing required for construction. Although this corridor crosses approximately 17 miles of greater sage grouse core area, it does so paralleling a developed transportation corridor.

Alternative Corridor V

Figure 11



Route ID	Links	Route Length (miles)	Wetlands Crossed (acres within 1 mile corridor)	Named Stream Crossings	Sage Grouse Core Area Crossed (Miles)	Mining Operation Crossed (Miles)	Parallel Existing Transmission Lines (Miles)	Miles of Existing Access Roads Within Corridor (excluding federal and state hwy)	Forested Acres (125 ft. buffer)	Miles of Abandoned Transmission Line ROW	Comments
V	5, 12, 13, 14, 19, 21, 22, 31, 33	151.40	775.92	53	16.38	8.42	12.08	379.05	450.29	48.00	Relatively low timber area, high sage grouse but does so near an existing travel corridor. Relatively low length. Approximately 47 miles of this route cross timber area in an abandoned 69 kV t-line ROW that has been previously cleared.

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