

DECISION RECORD
Ballard Petroleum Holdings, LLC, Gaither Draw Unit
Environmental Assessment (EA) WY-070-EA11-256
Buffalo Field Office, Bureau of Land Management

DECISION:

The BLM approves Ballard Petroleum Holdings, LLC’s (Ballard) 4 applications for permit to drill (APDs) in the Gaither Draw Unit (GDU) as described in Alternative B of EA WY-070-EA11-256. This approval includes the wells’ associated infrastructure.

Compliance: This decision complies with:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701).
- Mineral Leasing Act of 1920 (MLA) (30 U.S.C. 181); to include On Shore Order No. 1.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historical Preservation Act (1966) (16 USC 470).
- Buffalo Resource Management Plan (RMP) and Record of Decision (ROD) 1985, 2001, 2003, 2011.
- Buffalo and Powder River Basin Final Environmental Impact Statement (PRB FEIS), 1985, 2001, 2003.
- DOI Order 3310.

A summary of the details of the approval of Alternative B follows. The EA includes a project description, including specific changes made at the onsites, and site-specific mitigation measures.

Well Site:

BLM approves the following APDs and associated infrastructure:

WELL NAME	QRT/QRT	SECTION	TOWNSHIP	RANGE	LEASE #
GDU Fed 13-28	NWSW	28	48	73	WYW144493
GDU Fed 34-28	SWSE	28	48	73	WYW178104
GDU Fed 44-29	SESE	29	48	73	WYW143545
GDU Fed 12-5	SWNW	5	47	73	WYW0315470

Limitations: There are no denials or deferrals. Also see the conditions of approval (COAs).

THE FINDING OF NO SIGNIFICANT IMPACT (FONSI): Analysis of Alternative B of the EA, WY-070-EA11-256, and the FONSI found GDU will have no significant impacts on the human environment beyond those described in the PRB FEIS, thus an EIS is not required.

COMMENT OR NEW INFORMATION SUMMARY.

Since development of Ballard’s GDU proposal, Buffalo Field Office (BFO) received a new policy on management of sage-grouse populations and habitats and an Interior Department policy on wilderness.

DECISION RATIONALE:

The rationale supporting the decision approving the GDU follows:

1. Ballard and BLM included design features and mitigation measures reducing environmental impacts while meeting the project’s need. For a complete description of all site-specific COAs associated with this approval, see the GDU COAs.
2. The selected alternative will not result in any undue or unnecessary environmental degradation.

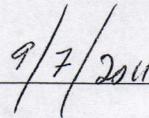
3. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability:
4. The operator committed to:
 - Comply with all applicable federal, state, and local laws and regulations.
 - The operator incorporated several measures to alleviate resource impacts into their surface use plan and drilling plan submitted.
5. Ballard certified it has a surface use agreement with the landowner(s) or bonded.
6. The project is clearly lacking in wilderness characteristics as it has no federal surface acreage.

ADMINISTRATIVE REVIEW AND APPEAL: This decision is subject to administrative review according to 43 CFR 3165. Request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received. Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager



Date:



FINDING OF NO SIGNIFICANT IMPACT
Ballard Petroleum Holdings, LLC, Gaither Draw Unit
Environmental Assessment (EA) WY-070-EA11-256
Buffalo Field Office, Bureau of Land Management

FINDING OF NO SIGNIFICANT IMPACT (FONSI): Based on the information in EA WY-070-EA11-266, which is incorporated here by reference; and all information, I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those already addressed in the Buffalo Final Environmental Impact Statement (FEIS) 1985, and the Powder River Basin (PRB) FEIS, 2003, to which the EA tiers; (2) Alternative B conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (1985, 2001, 2003); and (3) Alternative B does not constitute a major federal action having a significant effect on the human environment. Thus an EIS is not required. I base this finding on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), both with regard to the context and to the intensity of the impacts described in the EA, and in consideration of Interior Department Order 3310.

CONTEXT: Mineral development is a long-standing and common land use in the PRB. About 42% of the nation's coal comes from the PRB. The PRB FEIS reasonably foreseeable development predicted and analyzed the development of 51,000 CBNG wells and 3,200 oil wells. The additional oil development described in Alternative B is insignificant within the national, regional, and local context.

INTENSITY: The implementation of Alternative B will result in beneficial effects in the forms of energy and revenue production however; there will also be adverse effects to the environment. Design features and mitigation measures included in Alternative B will minimize adverse environmental effects. The preferred alternative does not pose a significant risk to public health and safety. The geographic area of project does not contain unique characteristics identified in the 1985 RMP, 2003 PRB FEIS, or other legislative or regulatory processes. BFO used relevant scientific literature and professional expertise in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to oil development. Research findings on the nature of the environmental effects are not highly controversial, highly uncertain, or involve unique or unknown risks. The PRB FEIS predicted and analyzed oil development of the nature proposed with this project and similar projects. The selected alternative does not establish a precedent for future actions with significant effects.

There are no cultural or historical resources present that will be adversely affected by the selected alternative. The project area is clearly lacking in wilderness characteristics as it has no federal surface. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

ADMINISTRATIVE REVIEW AND APPEAL: This finding is subject to administrative review according to 43 CFR 3165. Request for administrative review of this finding must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this FONSI is received or considered to have been received. Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager: _____



Date: _____

9/7/2011

ENVIRONMENTAL ASSESSMENT (EA)
Ballard Petroleum Holdings, LLC, Gaither Draw Unit
WY-070-EA11-256
Buffalo Field Office, Bureau of Land Management

1. INTRODUCTION

This site-specific analysis tiers into and incorporates by reference the information and analysis in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS), #WY-070-02-065, 2003, the Buffalo Resource Management Plan (RMP) (1985, 2001, 2003, 2011) and the PRB FEIS Record of Decision (ROD) pursuant to 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on our website.

1.1. Background

Ballard Petroleum Holdings, LLC (Ballard or Operator) submitted notices of staking (NOSs) for the Gaither Draw Unit (GDU) wells as on the following dates:

WELL NAME	QRT/QRT	SECTION	TOWNSHIP	RANGE	NOS RECEIVED
GDU Fed 13-28	NWSW	28	48	73	01/13/2011
GDU Fed 34-28	SWSE	28	48	73	01/13/2011
GDU Fed 44-29	SESE	29	48	73	01/13/2011
GDU Fed 12-5	SWNW	5	47	73	01/18/2011

BLM conducted an NOS onsite on April 13, 2011. The BLM sent a NOS post-onsite resource concern letter on April 18, 2011. BLM received applications for permit to drill (APDs) on June 3, 2011.

1.2. Need for the Proposed Project

The need for this project is to determine how and under what conditions to balance natural resource conservation with allowing the operator to exercise lease rights to develop fluid minerals on federal leaseholds as described in their proposed project. Information contained in the application for permit to drill (APD) is an integral part of this EA and is incorporated by reference (CFR 1502.21). The extraction of fluid minerals is important to meeting the nation's energy needs. The fluid mineral leasing programs fall under the authority of the Mineral Leasing Act of 1920, the Federal Land Policy Management Act (FLPMA), and other laws and regulations.

1.3. Decision to be Made

The BLM will decide whether or not to approve the proposed development, and if so, under what terms and conditions to comport with the Bureau's multiple use mandate, environmental protection, and RMP.

1.4. Scoping and Issues

The BFO limited external scoping on this EA to its timely publication on the BFO website. Previously BFO conducted extensive external scoping for the PRB FEIS - discussed on p. 2-1 of the PRB FEIS and on p. 15 of the PRB ROD. This project is similar in scope to other fluid mineral development analyzed by the BFO. External scoping would be unlikely to identify new issues, as verified by the few fluid mineral EAs that were recently externally scoped such as the Clabaugh (WY-070-EA08-134) and Hollcroft/Stotts Draw (WY-070-EA07-021). Recent external scoping in 2010 and 2011 for a geographically-focused proposed RMP amendment revealed no new issues outside of the geographically-specific issues.

The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposed

development and project location to identify potentially affected resource and land uses. The ID team identified resources and land uses present and affected by the proposed project. This EA will not discuss resources and land uses that are either not present, not affected, or that the PRB FEIS adequately addressed. The ID team identified important issues for the affected resources to focus the analysis. This EA addresses the project and its site-specific impacts that were unknown and unavailable for review at the time of the PRB FEIS analysis to help the decision maker come to a reasoned decision. Project issues include:

- Soils and vegetation: site stability, reclamation potential, invasive species
- Wildlife: raptor productivity, greater sage-grouse lek occupancy and persistency
- Cultural: National Register eligible sites

These issues are not present, or minimally so, and were analyzed in the EIS and not analyzed in this EA:

- Geological resources
- Water resources
- Cave and karst resources
- Mineral resources: locatable, leasable-coal, salable
- Fire, fuels management, and rehabilitation
- Paleontology
- Visual resources
- Forest, lands, realty
- Renewable energy
- Rights-of-way
- Transportation
- Wilderness characteristics
- Livestock grazing
- Areas of critical environmental concern (ACEC)
- Wild and scenic rivers
- Wilderness study areas
- Social and economic resources
- Environmental justice
- Tribal Treaty rights

2. PROPOSED PROJECT AND ALTERNATIVES

2.1. Alternative A – No Action

The PRB FEIS considered a No Action Alternative, Volume 1, pp. 2-54 to 2-62. This alternative must also consider and combine the PRB FEIS analysis with the subsequent analysis and development from the adjacent and intermingled POD and 49 wells within 1 mile of this proposal: Bone Pile II, WY-070-EA00-177 (see Table 3.4). This comports to the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of over 51,000 coalbed natural gas(CBNG) and 3,200 oil wells. The no action alternative would consist of no new federal wells. This alternative would deny these APDs and /or POD requiring the operator to resubmit APDs or a POD that complies with statutes and the reasonable measures in the PRB RMP ROD in order to lawfully exercise conditional lease rights. This alternative could, through secretarial discretion suspend the senior leasehold, or could administratively cancel or withdraw the lease if improperly awarded, or seek to cancel the lease through a theory of superior title. It is not possible in the abstract to identify every interest and that is beyond the scope here.

2.2. Alternative B Modified Proposed Action

Project Name: Gaither Draw Unit

Well Name/Lease/Location/County:

WELL NAME	QRT/QRT	SECTION	TOWNSHIP	RANGE	LEASE #
GDU Fed 13-28	NWSW	28	48	73	WYW144493
GDU Fed 34-28	SWSE	28	48	73	WYW178104
GDU Fed 44-29	SESE	29	48	73	WYW143545
GDU Fed 12-5	SWNW	5	47	73	WYW0315470

Operator/Applicant: Ballard Petroleum, LLC
Surface Owners: Geis Trust, Chuck Tweedy

The proposed project is to drill and develop 4 oil wells. The project would be subject to the conditions-of-approval (COAs) for drilling an oil well in the BFO jurisdiction. For a detailed description of design features and construction practices associated with the proposed project, refer to the surface use plan (SUP) and drilling plan included with the APDs. Also see the subject APDs for maps showing the proposed well location and associated facilities described above.

Design features include:

The wells will be a vertical bore proposed on 40-acre spacing pattern with one well per location. The well will produce from the Parkman formation at an average depth of approximately 6,454 feet.

Drilling, Construction & Production:

- Ballard Petroleum anticipates completing drilling and construction in 2 years. Drilling and construction is year-round in the region. Weather may cause delays but delays rarely last multiple weeks. Timing limitations in the form of conditions of approval (COAs) and/or agreements with surface owners may impose longer temporal restrictions.
- A road network consisting of improved road and existing improved roads.
- An existing and proposed above ground power line network.
- A buried pipeline (oil, gas, produced water) to an existing central battery.
- Engineered pads with pump jacks. There will be no permanent fluid storage tanks on locations.
- A closed loop drilling system will be used. There will be no pits at the producing locations.

**Table 2.1. Disturbance Summary for Gaither Draw Unit by Well:
 GDU Fed 13-28**

Facility	Number or Miles	Factor	Disturbance
Engineered Pad	1 295ft x 230 ft	67,850 sq ft	1.55 acres
Improved Roads No Corridor	1,723 ft (0.32 mile)	30 ft	1.18 acres
Overhead Power	1,760 ft (0.33 mile)	30 ft	1.21 acres
Buried Pipeline (Oil, gas, water)	300 ft (0.05 miles)	30 ft	0.20 acres
Total Surface Disturbance	0.70 miles		4.14 acres

GDU Fed 34-28

Facility	Number or Miles	Factor	Disturbance
Engineered Pad	1 295ft x 230 ft	67,850 sq ft	1.55 acres
Improved Roads No Corridor	2,194 ft (0.42 mile)	30 ft	1.51 acres
Overhead Power	1,320 ft (0.25 mile)	30 ft	0.90 acres
Buried Pipeline (Oil, gas, wáter)	100 ft (0.02 mile)	30 ft	0.07 acres
Total Surface Disturbance	0.69 miles		4.03 acres

GDU Fed 44-29

Facility	Number or Miles	Factor	Disturbance
Engineered Pad	1 295ft x 230 ft	67,850 sq ft	1.55 acres
Improved Roads No Corridor	119 ft (0.02 mile)	30 ft	0.08 acres
Overhead Power	2,640 ft (0.50 mile)	30 ft	1.81 acres
Buried Pipeline (Oil, gas, water)	150 ft (0.03 mile)	30 ft	0.10 acres
Total Surface Disturbance	0.55 miles		3.54 acres

GDU Fed 12-5

Facility	Number or Miles	Factor	Disturbance
Engineered Pad	1 295ft x 230 ft	67,850 sq ft	1.55 acres
Improved Roads No Corridor	4,910 ft (0.92 mile)	30 ft	3.38 acres
Overhead Power	2,640 ft (0.50 mile)	30 ft	1.81 acres
Buried Pipeline (Oil, gas, wáter)	3,100 ft (0.58 mile)	30 ft	2.13 acres
Total Surface Disturbance	2.0 miles		8.87 acres

Table 2.2. Total Disturbance of Gaither Draw Unit Wells

Facilities	Number or Miles	Factor	Disturbance
Engineered Pad	4 @ 295ft x 230 ft	271,400 sq ft	6.20 acres
Improved Roads No Corridor	8,946 ft (1.68 mile)	30 ft	6.15 acres
Overhead Power	8,360 ft (1.58 mile)	30 ft	5.73 acres
Buried Pipeline (Oil, gas, wáter)	3,650 (0.68 mile)	30 ft	2.50 acres
Total Surface Disturbance	3.94 miles		20.58 acres

Implementation of committed mitigation measures contained in the SUP and drilling plan, in addition to the COAs in the PRB FEIS ROD, as well as changes made at the onsite, are incorporated and analyzed in this alternative.

Additionally, the Operator, in their APD, committed to:

1. Comply with all applicable federal, state and local laws and regulations.
2. Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, and relevant air quality permits.
3. The Operator certified he has a surface use agreement with the landowner(s) or bonded.
The Operator certified that a copy of the SUP was provided to the relevant landowner(s).

Description of Proposed Mitigation Measures:

Implementation of committed mitigation measures contained in the surface use plan of operations and drilling plan, in addition to the attached COAs, would ensure that no adverse environmental impacts would result from approval of the proposed action

2.3. Alternatives Considered but Eliminated from Detailed Analysis

No additional alternatives were considered.

2.4. Conformance with the Land Use Plan and Other Environmental Assessments

This proposal does not diverge from the goals and objectives in the Buffalo Resource Management Plan (RMP), 1985, 2001, 2003, 2011 and conforms to the terms and conditions of that land use plan, its amendments, and supporting FEISs, 1985, 2003 and Interior Department Order 3310. Processing these APDs did not use the rebuttable presumption in the 2005 Energy Policy Act to process via a categorical exclusion to save time since this EA initiation pre-dated the 12 August 2011 decision by the Federal District Court of Wyoming.

3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment affecting the project area. Aspects of the affected environment here focus on the major issues. Resources unaffected, or not affected beyond the level analyzed in the PRB FEIS, are outside the scope of this EA.

Project Area Description

The proposed project is within the Gaither Draw Unit, which includes an area of approximately 10,471 acres. The project area is located approximately 10 miles south of Gillette, Wyoming, and in southwestern Campbell County. Gaither Draw Unit is in the PRB geographic area (Wyoming Geographic Landforms Map). Topography in the project area contains broken ridgelines, moderately incised arroyos along ephemeral dendritic drainages. Elevations average 4,500 feet above sea level. The landform is a combination of bedrock residuum and slopewash deposits. Cabello Creek, an ephemeral drainage, and South Prong Creek are adjacent to the project area. Land uses and other disturbances occurring in the project area include wildlife habitat, livestock grazing, ranching, dry land farming, extensive mineral development (conventional oil and CBNG), and improved and unimproved roads. It is reasonably foreseeable development that in this unit and its locality to include but not limited to the above APDs will fill-in to 80-acre spacing. This comports with the PRB development anticipated in the PRB FEIS, (see narrative in Section 2, No Action Alternative).

3.1. Air Quality

Existing air quality throughout most of the PRB is in attainment with all ambient air quality standards. Specific air quality monitoring in the PRB occurs at 3 Wyoming state sites: Cloud Peak; Thunder Basin (NE of Gillette); and Campbell County (SSW of Gillette). Air quality in rural areas is generally very good (ozone less than 60 parts per billion (ppb), minimal nitrous oxide (NO_x) and volatile organic compounds (VOCs). However in recent years the region had some ozone ratings between 65 and 70 (ppb) and had a few air quality advisories due to dust, of which it is thought that coal mine dust contributed. The area has few and dispersed emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion. This results in relatively low air pollutant concentrations as the area does not have a “bowl-like” topography which may trap low-level ozone layers. Instead the open topography fosters low-level air exchange (high winds). Yet the air quality issue is receiving greater monitoring and regulatory scrutiny in Wyoming since the ozone in the Upper Green River Basin exceeded the worst in the nation for 13 days in 2011 and had air quality issues since 2005 due, in part, to affects from oil and gas field operations.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrous oxides [NO_x]) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- Dust (particulate matter) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas and road sanding during the winter months;
- Transport of air pollutants from emission sources located outside the region;
- Dust (particulate matter) from coal mines;
- NO_x, particulate matter, and other emissions from diesel trains; and
- SO₂ and NO_x from power plants.
- For a description of the 2003-era air quality conditions in the PRB, refer to the PRB Final EIS Volume 1, Chapter 3, pp. 3-291 to 3-299.

3.2. Soils, Vegetation & Ecological Sites

The PRB has relatively young soils which developed in alluvium and residuum derived from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams. Soils have surface and subsurface textures of silt loam and fine sandy loam. Soil depths vary from deep on lesser slopes to shallow and very shallow on steeper slopes. Soils are generally productive, though varies with texture, slope and other characteristics. Soils differ with topographic location, slope and elevation. Topsoil depths to be salvaged for reclamation range from 4 to 6 inches on ridges to 8+ inches in bottomland. The soils vary from primarily 81% loamy to 17% clayey and 2% sandy throughout

the GDU project area. Soils differ with topographic location, slope and elevation. Erosion potential varies depending on the soil type, vegetative cover and slope. Reclamation potential of soils also varies from 75% with fair reclamation potential to 25% with poor reclamation potential throughout the project area.

The map unit symbols for the soils identified above for the identified soil map unit symbols found within the POD boundary are listed in Table 3.1. below. Ecological Site Descriptions are soil and vegetation community descriptions compiled by the Natural Resources Conservation Service (NRCS) for the purpose of resource identification, and providing management and reclamation recommendations.

Table 3.1. Dominant Soils Affected by the Proposed Action

Map Unit	Map Unit Name	Acres	Percent
250	Ziggy-Ucross-Oldwolf loams, 3-15 percent slopes	1235	12
225	Ucross-Iwait-Fairburn loams, 0 to 6 percent slopes	1018	10
224	Ucross-Iwait loams, 0 to 6 percent slopes	927	8
134	Deekay-Oldwolf loams, 0 to 6 percent slopes	969	9
217	Theedle-Shingle loams, 3 to 30 percent slopes	914	8.7
248	Ziggy-Iwait loams, 0 to 6 percent slopes	589	5.6
183	Moorhead-Leiter clay loams, 0 to 6 percent slopes	479	4.5

BLM identified soils in the project area from the South Campbell County Survey Area, Wyoming (WY605).

The NRCS performed the soil survey according to National Cooperative Soil Survey standards. BLM obtained pertinent information for analysis from the published soil survey and the National Soils Information System (NASIS) database for the area.

Soils with poor reclamation and re-vegetation potential occur throughout the project area as shown in Table 3.2. Currently soil conditions in the project area are being impacted by CBNG development as well as traditional activities, including livestock grazing and wildlife use. Much of the area has soils that are easily damaged by use or disturbance or are difficult to revegetate or otherwise reclaim. Soil impacts (e.g., roads, linear pipeline scars, and artificial wet areas) can be readily observed in the area. This high erosion potential could result in higher suspended sediment and turbidity levels in the Powder River.

In the absence of recoverable topsoil as is common throughout the project area, the surface organic matter in the form of vegetation, litter, and biological crust are critical to maintaining soil integrity and viability.

Table 3.2. Reclamation Potential within the Gaither Draw Unit Project Area

Reclamation Potential		
	Fair	Poor
Total Acres	7,837	2,628
% of Project Area	75%	25%

Reclamation potential of soils varies throughout the project area from fair (75%) to poor (25%). The main soil limitations in the project area include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

Ecological site descriptions are used to provide site and vegetation information needed for resource identification, management and reclamation recommendations. To determine the appropriate ecological

sites for the area contained in this proposed action, BLM specialists analyzed data from onsite field reconnaissance and NRCS published soil survey soils information. A summary of the dominant ecological sites in the project area are listed in Table 3.3. along with the individual acreage and the percentage of the total area identified in the GDU project area.

Table 3.3. Summary of Dominant Ecological Sites

Dominant Ecological Site	Acres	Percent
Loamy (LY)	8,386.5	81%
Clayey (CY)	1,685	17%
Sandy (SY)	224.3	2%

Species typical of short grass prairie comprise the project area flora. Two dominant plant communities were identified in the project area: Sagebrush grassland and mixed-grass prairie. Specific species in sagebrush grassland observed throughout the project area include Wyoming big sagebrush (*Artemisia ssp.*), silver sagebrush (*Artemisia cana*), western wheatgrass (*Agrophron smithii*), junegrass (*Keoheria macrantha*), needle and thread grass (*Hesperostipa comate*), sandbur bluegrass (*poa secunda*), prickly pear cactus, and rabbit brush (*Chrysothamnus spp*). Specific species in mixed-grass prairie observed in the project area include needle and thread grass, western wheatgrass, grama (*Bouteloua ssp.*), prickly pear cactus, and Wyoming big sagebrush. Differences in dominant species within the project area vary with soil type, aspect and topography.

3.3. Leasable Minerals - Fluids

The area had historic conventional oil and gas exploration and production, and more recently CBNG development. There are 49 wells (producing oil, producing CBNG, plugged and abandoned oil and CBNG, and injection wells) within 1 mile of the proposed location as of June 28, 2011.

Table 3.4. Adjacent or Overlapping Development

POD Name	Environmental Assessment #	Decision Date
Bone Pile II POD	WY-070-00-177	07/12/2000

3.4. Invasive Species

No state-listed noxious weeds and invasive/exotic plant infestations were discovered by a search of inventory maps and/or databases or during subsequent field investigation by the proposed project proponent. Some minor areas of cheatgrass or downy brome (*Bromus tectorum*) were discovered along existing disturbances in the project area.

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) are known to exist in the affected environment. These two species are found in high densities and numerous locations throughout NE Wyoming.

3.5. Wildlife

Biologists consulted several resources to identify wildlife species that may occur in the proposed project area. Consulted resources include the wildlife database compiled and managed by the BFO wildlife biologists, the PRB FEIS, the Wyoming Game and Fish Department (WGFD) big game and sage-grouse maps, and the Wyoming Natural Diversity Database (WYNDD).

Western Land Services (WLS) performed habitat assessment and wildlife inventory surveys. WLS performed surveys for mountain plover, raptor nests, and prairie dog colonies according to Powder River Basin Interagency Working Group (PRBIWG) accepted protocol in 2011 (WLS 2011). WLS performed a habitat assessment for greater sage-grouse, sharp-tailed grouse, and Ute ladies'-tresses orchid habitat.

PRBIWG accepted protocol is available on the BFO internet website at:
http://www.blm.gov/wy/st/en/field_offices/Bufalo/wildlife.html.

A BLM biologist conducted field visits on April 13, 2011. During this time, the biologist reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project design modification recommendations where wildlife issues arose.

WGFD is the agency responsible for management of wildlife populations in the state of Wyoming. WGFD developed several guidance documents that BLM BFO wildlife staff relies upon in evaluating impacts to wildlife and wildlife habitats. WGFD documents used to analyze the proposed project under the current analysis are referenced in this section.

3.5.1. Habitat Types

Habitats located in the project area primarily consist of gently rolling sagebrush grasslands and cultivated hay fields. Grassland areas are dominated by native grasses and perennial forbs. Wyoming big sagebrush occurs in sparse to dense stands throughout the project area. A more in depth description of vegetation in the area can be found in Section 3.2, Soils, Vegetation, & Ecological Sites.

Mature trees occur along South Prong Caballo and Caballo Creeks, along with several small reservoirs and ponds along unnamed tributaries. The area is drained by unnamed tributaries to South prong Caballo and Caballo Creeks, both being ephemeral drainages. Perennial water, other than that which is contained, does not occur in the project area.

3.5.2. Threatened, Endangered, Proposed, Candidate, and BLM Sensitive Species

3.5.2.1. Threatened and Endangered Species

Threatened, endangered, candidate and proposed species occurring in the area will not be impacted beyond the level of the PRB FEIS, and a discussion of the affected environment is in the PRB FEIS, pp. 3-174 to 3-179. Blowout penstemon was unlisted when the PRB FEIS was written. A description of habitat and presence for threatened and endangered species is in Table 4.2 located in Section 4.2 below.

Black-footed ferret, blowout penstemon, and Ute ladies'-tresses (ULT) habitat is not present in the GDU area and the species are not expected to occur. Additional information on sage-grouse is discussed below.

3.5.2.2. Candidate Species

3.5.2.2.1. Greater Sage-grouse

The PRB FEIS discusses the affected environment for greater sage-grouse (sage-grouse) on pp. 3-194 to 3-199. The US Fish and Wildlife Service (USFWS) warranted the sage-grouse for federal listing, in 2010, but precluded listing for higher priority listing actions. In addition to being a Wyoming BLM sensitive species, sage-grouse are a WGFD species of greatest conservation need, because populations are declining and they are experiencing ongoing habitat loss. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. They are also a USFWS bird of conservation concern (BCC) for Region 17.

The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) recommends that impacts be considered for leks within 4 miles of oil and gas developments. WGFD records indicate that 2 abandoned sage-grouse leks occur within 4 miles of the project area: Caballo West and Mankin. Although no known occupied leks are documented in the area, the area is primarily privately owned and unlikely to have had any recent surveys for new sage-grouse breeding activity. WLS did not conduct sage-grouse breeding surveys during the appropriate survey window (WLS 2011).

Sage-grouse are found in prairie, sagebrush shrublands, other shrublands, wet meadows, and agricultural areas. They depend upon substantial sagebrush stands for nesting and winter survival (BLM 2003). Suitable sage-grouse habitat is present in the project area. Riparian areas and draw bottoms along South Prong Caballo and Caballo Creeks and their tributaries contain a diverse mix vegetation that could support sage-grouse and their broods during summer and early fall. Sage-grouse habitat models indicate that portions of the project area may contain high quality sage-grouse nesting habitat (Walker et al. 2007). Suitable nesting and brood rearing habitat was documented in the vicinity of all 4 proposed well locations. The BLM biologist documented moderate amounts of sage-grouse scat at the GDU 44-29 well location by during the onsite visit.

3.5.3. Sensitive Species

Wyoming BLM sensitive species receive focused management efforts towards maintaining habitats under a multiple use mandate. The goals of the policy are to:

- Maintain vulnerable species and habitat components in functional BLM ecosystems
- Ensure sensitive species are considered in land management decisions
- Prevent a need for species listing under the ESA
- Prioritize needed conservation work with an emphasis on habitat

The authority for the sensitive species policy and guidance comes from the Endangered Species Act of 1973, Title II of the Sikes Act, FLPMA; Department Manual 235.1.1A, and BLM policy. BLM Wyoming sensitive species are not likely to be impacted beyond the level analyzed in the PRB FEIS. A discussion of the affected environment for BLM sensitive species is in the PRB FEIS, pp. 3-189 to 3-201. A description of habitat and species presence for BLM sensitive species is in Table 4.3 in Section 4.4 below.

3.5.4. Big Game

The PRB FEIS discussed the affected environment for pronghorn and mule deer, pp. 3-117 to 3-122 and pp. 3-127 to 3-132, respectively. The project area contains winter-yearlong range for pronghorn antelope and yearlong range for mule deer. White-tailed deer may also occur in the area. Winter-yearlong use is when a population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis. During the winter months there is a significant influx of additional animals into the area from other seasonal ranges. Yearlong use is when a population of animals makes general use of suitable documented habitat sites within the range on a year round basis. Animals may leave the area under severe conditions.

3.5.5. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds on pp. 3-150 to 3-153. Migratory birds are birds that migrate for breeding and foraging at some point in the year. The BLM-USFWS MOU (2010) promotes the conservation of migratory birds, as directed through Executive Order 13186 (Federal Register V. 66, No. 11). BLM must include migratory birds in every NEPA analysis of actions that have potential to affect migratory bird species of concern to fulfill obligations under the MBTA. Unintentional violations of MBTA have resulted in costly prosecutions and settlements, and have initiated costly retrofitting of project components. Individual settlements have ranged from \$15,000 in fines (plus retrofitting) to a Wyoming settlement for \$10.5 million in fines, restitution and retrofitting costs. BLM encourages voluntary design features and conservation measures that comport with those in the programmatic mitigation in Appendix A of the PRB ROD (2003).

Habitats occurring near the proposed well locations include sage-brush steppe grasslands and mixed grass prairie. Many species that are of high management concern use these areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds have declined more consistently than any other ecological association of birds over the last 30 years (WGFD 2009).

The WGFD Wyoming Bird Conservation Plan (Nicholoff 2003) identified three groups of high-priority bird species in Wyoming: Level I – those that clearly need conservation action, Level II – species where the focus should be on monitoring, rather than active conservation, and Level III – species that are not otherwise of high priority but are of local interest. Those species that are anticipated to occur in the project area are listed in Table 3.5.

Table 3.5. Migratory Birds Occurring in Shrub-Steppe Habitat in NE Wyoming (Nicholoff 2003)

Level	Species	Wyoming BLM Sensitive
Level I	Brewer’s sparrow	Yes
	Ferruginous hawk	Yes
	Greater sage-grouse	Yes
	McCown’s longspur	
	Sage sparrow	Yes
Level II	Lark bunting	
	Lark sparrow	
	Loggerhead shrike	Yes
	Sage thrasher	Yes
	Vesper sparrow	
Level III	Common poorwill	
	Say’s phoebe	

3.5.6. Raptors

The PRB FEIS discussed the affected environment for raptors on pp. 3-141 to 3-148. There are 4 raptor nests documented within 0.5 miles of the 4 proposed wells and infrastructure (Table 3.6.). WLS conducted raptor nest surveys on June 6 and 7, 2011 (WLS 2011). BLM and USFWS biologists documented nest #12625 at the onsite visit. WLS only documented nest #2106 and #2107 in their report, though the new nest is within 0.5 miles and line of site of proposed well 34-28 (WLS 2011). Thus it is unknown how thorough or accurate was the raptor survey.

Table 3.6. Documented Raptor Nests within 0.5 miles of the 4 GDU Wells.

BLM ID #	Legal	Substrate	Year	Condition	Status	Species
2106	S6 T47N R73W	Live Cottonwood	2011	Did Not Locate	Unknown	N/A
			2004	Good	Inactive	N/A
2107	S5 T47N R73W	Ground Hillside	2011	Remnants	Inactive	N/A
			2004	Poor	Inactive	N/A
			2003	Poor	Inactive	N/A
12593	S4 T47N R73W	Live Cottonwood	2011	Good	Active	Unknown Raptor
12625	S33 T48N R73W	Live Willow	2011	Good	Active	Red-tailed Hawk

3.5.7. Plains Sharp-tailed Grouse

The PRB FEIS discussed the affected environment for plains sharp-tailed grouse on pp. 3-148 to 3-150. No known sharp-tailed dancing grounds occur in the project area, however the area is primarily privately owned and unlikely to have had any recent surveys for new breeding activity. WLS did not conduct

sharp-tailed grouse breeding surveys during the appropriate survey window (WLS 2011). Marginal nesting and brood-rearing habitat is present in the project area, and the species is suspected to occur.

3.6. Cultural Resources

BLM performed a class III cultural resource inventory for the GDU Federal 12-5, GDU Federal 13-28, and GDU Federal 34-28 well pads and access roads prior to on-the-ground project work (BFO project no. 70110047). Ballard provided BFO with a class III cultural resource inventory for the GDU Federal 13-28 pipeline, but the class III linear inventory occurred after trenching 877 feet of the pipeline. This resulted in Ballard's apparent noncompliance with Section 106 of the National Historic Preservation Act (NHPA). This area of surface disturbance is not in an area BLM determined appropriate for cultural monitoring. Two previously accepted class III cultural resource inventories (BFO# 70000013.1-13 and 70000175) covered the GDU Federal 44-29 well, access road, and pipeline. The new class III cultural resource inventory reports follow the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the Wyoming State Historic Preservation Office (SHPO) Format, Guidelines, and Standards for Class II and III Reports. Ardeth Hahn, BLM Archaeologist, reviewed the reports for technical adequacy and compliance with BLM standards, and determined them adequate. No cultural resources are in or near the project area.

Some of the project area analyzed in this EA occurs on deep alluvial deposits. Alluvial deposits typically have a high potential for buried cultural resources, which are nearly impossible to locate during a Class III inventory (Ebert & Kohler 1988:123; Eckerle 2005:43).

3.7. Wilderness Characteristics

The area is clearly lacking wilderness characteristics as it has no federal surface acreage.

4. ENVIRONMENTAL EFFECTS

This section analyzes and describes the environmental effects of Alternative B, on the affected environment described in Section 3. This section analyzes changes to the proposed project resulted in development of Alternative B as the preferred alternative. The changes reduced impacts to the environment which will result from this project therefore only the environmental consequences of Alternative B are described below.

4.1. Air Quality

In the project area, air quality impacts would occur during construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, as well as drilling rig and vehicle engine exhaust) and production (including non-CBNG well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. Air quality impacts modeled in the PRB FEIS concluded that projected oil & gas development would not violate any local, state, tribal or federal air quality standards.

4.2. Soils, Vegetation & Ecological Sites

Proposed stream crossings, including culverts and fords (low water crossings) are shown on the SUP. These structures would be constructed in accordance with sound engineering practices and BLM standards. Table 4.1. summarizes the proposed surface disturbance.

Table 4.1. - Summary of Disturbance

Facilities	Number or Miles	Factor	Disturbance	Duration of Disturbance
Engineered Pads	4 @ 295ft x 230 ft	271,400 sq ft	6.20 acres	Long-term
Improved Roads No Corridor	8,946 ft (1.68 mile)	30 ft	6.15 acres	Long-term
Overhead Power	8,360 ft (1.58 mile)	30 ft	5.73 acres	Short-term
Buried Pipeline (Oil, gas, wáter)	3,650 (0.68 mile)	30 ft	2.50 acres	Short-term
Total Surface Disturbance	3.94 miles		20.58 acres	

The PRB FEIS defined the designation of the duration of disturbance on pp. 4-1 and 4-151. “For this EIS, short-term effects are defined as occurring during the construction and drilling/completion phases. Long-term effects are caused by construction and operations that would remain longer”.

4.2.1. Direct and Indirect Effects

The impacts listed below, singly or in combination, would increase the potential for valuable soil loss due to increased water and wind erosion, invasive plant establishment, and increased sedimentation and salt loads to the watershed system.

The effects to soils resulting from well pad, access roads and pipeline construction include:

- Mixing of horizons – occurs where construction on roads, pipelines or other activities take place. Mixing may result in removal or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Soils which are more susceptible to wind and water erosion may be moved to the surface. Soil structure may be destroyed, which may impact infiltration rates. Less desirable inorganic compounds such as carbonates, salts or weathered materials may be relocated and have a negative impact on revegetation. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
- Loss of soil vegetation cover, biologic crusts, organic matter and productivity.
- Soil erosion would also affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography and cover.
- Soil compaction – the collapse of soil pores results in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery.
- Alteration of surface run-off characteristics.
- An important component of soils in Wyoming’s semiarid rangelands, especially in the Wyoming big sagebrush cover type, are biological soil crusts, or cryptogamic soils that occupy ground area not covered with vascular plants. Biological soil crusts are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (BLM 2003). They are adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily disturbed or destroyed by surface disturbances associated with construction activities.

Direct effects to vegetation would occur from ground disturbance caused by construction of well pads, compressor stations, ancillary facilities, associated pipelines and roads. Short term effects would occur where vegetated areas are disturbed but later reclaimed within 1 to 3 years of the initial disturbance. Long-term effects would occur where well pads, compressor stations, roads, water-handling facilities or other semi-permanent facilities would result in loss of vegetation and prevent reclamation for the life of the project.

Sagebrush does not come back easily after human disturbance such as urban or agricultural development, or even after natural occurrences such as wildfire. It takes years, maybe generations, for sagebrush to fully grow back. Sagebrush still hasn't returned to some areas of the Columbia Basin burned by a large fire 40 years ago (Pacific Northwest National Laboratory Shrub Steppe Ecology Series May 2010).

4.2.2. Cumulative Effects

The PRB FEIS defined the designation of the duration of disturbance on pp. 4-1 and 4-151. Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization, as committed to by the operator in their SUP and as required by the BLM in COAs.

Geomorphic effects of roads and other surface disturbance range from chronic and long-term contributions of sediment into waters of the state to catastrophic effects associated with mass failures of road fill material during large storms. Roads can affect geomorphic processes primarily by: accelerating erosion from the road surface and prism itself through mass failures and surface erosion processes; directly affecting stream channel structure and geometry; altering surface flow paths, leading to diversion or extension of channels onto previously unchannelized portions of the landscape; and causing interactions among water, sediment, and debris at road-stream crossings.

These impacts, singly or in combination, could increase the potential for valuable soil and vegetation loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system.

4.2.3. Mitigation Measures

Following the BLM mitigation will reduce impacts to soils and vegetation from surface disturbance.

- BLM will consider having the Operator follow the guidance provided in Appendix A of this EA, the Wyoming Policy on Reclamation. Appendix A (Wyoming Reclamation Policy) would apply to all surface disturbing activities. Authorizations for surface disturbing actions are based upon the assumptions that an area can and ultimately will be successfully reclaimed. BLM reclamation goals emphasize eventual ecosystem reconstruction, which means returning the land to a condition approximate to an approved "Reference Site" or NRCS Ecological Site Transition State. Final reclamation measures are used to achieve this goal. BLM reclamation goals also include the short-term goal of quickly stabilizing disturbed areas to protect both disturbed and adjacent undisturbed areas from unnecessary degradation. Interim reclamation measures are used to achieve this short-term goal.
- Compaction would be remediated by plowing or ripping.

4.2.4. Residual Effects

Residual effects were also identified in the PRB FEIS at p. 4-408 such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

4.3. Invasive Species

The operator committed to the control of noxious weeds and species of concern using the following measures identified in their Integrated Pest Management Plan (IPMP): Control Methods, including frequency of treatment, preventive practices, and education.

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. These species are found in such high densities and numerous locations throughout northeast Wyoming that a control program is not considered feasible at this time.

The use of existing facilities along with the surface disturbance associated with construction of proposed access roads, pipelines, and related facilities would present opportunities for weed invasion and spread. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, Canada thistle, and perennial pepperweed. However, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

4.4. Wildlife

4.4.1. Threatened, Endangered, Proposed and Candidate Species

4.4.1.1. Threatened and Endangered Species

The effects to threatened, endangered, and candidate species are summarized in Table 4.2. below, and described in the PRB FEIS on pp. 4-250 to 4-257. More information on sage-grouse is discussed below.

Table 4.2. Summary of Threatened and Endangered Species Habitat and Project Effects

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
<i>Endangered</i>				
Black-footed ferret	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	No known colonies present USFWS block-cleared PRB
Blowout penstemon	Sparsely vegetated, shifting sand dunes	NP	NE	Habitat not present
<i>Threatened</i>				
Ute ladies'-tresses orchid	Riparian areas with permanent water	NP	NE	Habitat not present
<i>Candidate</i>				
Greater Sage-grouse	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Suitable nesting and brood rearing habitat is present. A timing limitation on surface disturbing activities will mitigate impacts to from drilling and construction.
Presence K – Known, documented observation within project area. S – Habitat suitable and species suspected, to occur within the project area. NS – Habitat suitable but species is not suspected to occur within the project area. NP – Habitat not present and species unlikely to occur within the project area.			Project Effects LAA – Likely to adversely affect NE – No Effect NLAA – May Affect, not likely to adversely affect individuals or habitat. NLJ – Not likely to jeopardize the continued existence of the species. MIIH – May impact individuals and habitat NI – No impact	

4.4.1.2. Candidate Species

4.4.1.2.1. Greater Sage-grouse

4.4.1.2.1.1. Direct and Indirect Effects

Impacts to sage-grouse associated with energy development are discussed in detail in the, “12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or

Endangered,” (USFWS 2010). Impacts to sage-grouse are generally a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. Research indicates that sage-grouse hens also avoid nesting in developed areas.

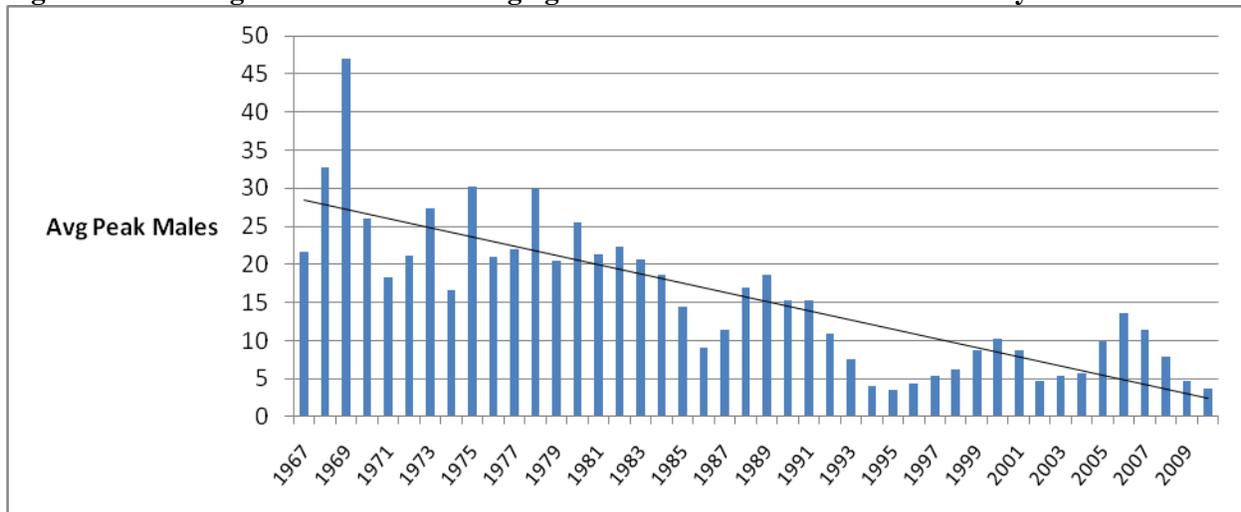
According to habitat models, the GDU 13-28, 34-28, 44-29, and 12-5 wells (and associated infrastructure) are all located within 2 miles of high quality nesting habitat. Construction of access roads, utility corridor, and proposed well locations will result in a direct loss of approximately 20 acres of sage-grouse habitat. For a specific breakdown of proposed disturbance per well, see Table 1 in Section 2.2 Alternative B. Sage-grouse are known to use portions of the project area, although it is unclear whether or not any occupied leks are present. Implementation of the proposed project will impact sage-grouse habitat and individuals.

4.4.1.2.1.2. Cumulative Effects

The sage-grouse population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2010). Figure 4.2 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that these declines may be a result, in part, of CBNG development, as discussed in detail in USFWS (2010).

The PRB FEIS (BLM 2003) states that “the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its federal listing. Local populations may be extirpated in areas of concentrated development, but viability across the Project Area [Powder River Basin] or the entire range of the species is not likely to be compromised (pg. 4-270).” Based on the impacts described in the PRB FEIS and the findings of more recent research, the proposed action may contribute to extirpation of the local grouse population.

Figure 4.2. Average Peak Number of Sage-grouse Males at WGFD Count Leks by Year in the PRB



4.4.1.2.1.3. Mitigation Measures

In order to reduce the impacts to sage-grouse associated with noise, construction, and human disturbance resulting from implementation of the proposed project, BLM will implement a survey and a timing limitation on all surface-disturbing activities in and adjacent to identified nesting habitat across the project area per the RMP. Because nesting grouse are shown to avoid infrastructure by up to 0.6 miles, the intent of this timing restriction is to decrease the likelihood that grouse will avoid these areas and increase habitat quality by reducing noise and human activities during the breeding season.

4.4.1.2.1.4. Residual Effects

A timing limitation does nothing to mitigate loss and fragmentation of habitat or changes in disease mechanisms. Suitability of the project area for sage-grouse will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with oil and gas development.

4.4.1.3. Sensitive Species

BLM will take necessary actions to meet the policies set forth in sensitive species policy (BLM Manual 6840). BLM Manual 6840.22A states that “The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species categories are no longer necessary, and future listings under special status species categories would not be necessary.”

The effects to sensitive species resulting from implementation of the project are identified in Table 4.3. below, and discussed in the PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-265.

Table 4.3. Summary of Sensitive Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
<i>Amphibians</i>				
Northern leopard frog (<i>Rana pipiens</i>)	Beaver ponds and cattail marshes from plains to montane zones.	S	MIIH	Existing reservoirs and ponds may be being used by frogs. Noise produced by surface disturbing and maintenance activities may impact ability to hear vocalizations within population.
Columbia spotted frog (<i>Ranus pretiosa</i>)	Ponds, sloughs, small streams, and cattails in foothills and montane zones. Confined to headwaters of the S Tongue R drainage and tributaries.	NP	NI	The project area is outside the species' range, and the species is not expected to occur .
<i>Fish</i>				
Yellowstone cutthroat trout (<i>Oncoryhynchus clarki bouvieri</i>)	Cold-water rivers, creeks, beaver ponds, and large lakes in the Upper Tongue sub-watershed	NP	NI	The project area is outside the species' range, and the species is not expected to occur.
<i>Birds</i>				
Baird's sparrow (<i>Ammodramus bairdii</i>)	Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground.	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Mature forest cover often within one mile of large water body with reliable prey source nearby.	S	MIIH	Bald eagles are not likely to use mature trees in the project area for nesting or winter roosting. Surface disturbing and maintenance activities may impact foraging eagles and the species may avoid the area.
Brewer's sparrow (<i>Spizella breweri</i>)	Sagebrush shrubland	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Ferruginous hawk (<i>Buteo regalis</i>)	Basin-prairie shrub, grasslands, rock outcrops	S	MIIH	Nest 2107 is a ground nest that was likely to be used by ferruginous hawks. The nest is reported as remnants. Hawks are unlikely to return to the nest due to the 10 producing gas wells located within 0.5 miles. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Long-billed curlew (<i>Numenius americanus</i>)	Grasslands, plains, foothills, wet meadows	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Mountain Plover	Short-grass prairie with slopes < 5%	NP	NI	Habitat not present
Northern goshawk (<i>Accipiter gentilis</i>)	Conifer and deciduous forests	NP	NI	Habitat not present.
Peregrine falcon (<i>Falco peregrinus</i>)	Cliffs	NP	NI	Habitat not present.
Sage sparrow (<i>Amphispiza billneata</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Sage thrasher (<i>Oreoscoptes montanus</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Trumpeter swan (<i>Cygnus buccinator</i>)	Lakes, ponds, rivers	S	MIIH	Existing reservoirs and ponds in the area may attract swans during migration periods. The species may be disturbed by dust, noise, and human activities associated with project implementation.
Western Burrowing owl (<i>Athene cunicularia</i>)	Grasslands, basin-prairie shrub	NP	NI	Habitat not present.
White-faced ibis (<i>Plegadis chihi</i>)	Marshes, wet meadows	NP	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Open woodlands, streamside willow and alder groves	NP	NI	Habitat not present.
<i>Mammals</i>				
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	NP	NI	No known colonies present.
Fringed myotis (<i>Myotis thysanodes</i>)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (<i>Myotis evotis</i>)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Swift fox (<i>Vulpes velox</i>)	Grasslands	NS	NI	Although suitable habitat is present, a lack of abundant prey source reduces the likelihood that foxes will occur.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Caves and mines.	NP	NI	Habitat not present.
<i>Plants</i>				
Limber Pine (<i>Pinus flexilis</i>)	Mountains, associated with high elevation conifer species	NP	NI	Habitat not present.
Porter's sagebrush (<i>Artemisia porteri</i>)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (<i>Cymopterus williamsii</i>)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NP	NI	Project area outside of species' range.
Presence K - Known, documented observation within project area. S - Habitat suitable and species suspected, to occur within the project area. NS - Habitat suitable but species is not suspected to occur within the project area. NP - Habitat not present and species unlikely to occur within the project area.		Project Effects NI - No Impact. MIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species. WIPV - Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species. BI - Beneficial Impact		

4.4.1.4. Big Game

4.4.1.4.1. Direct and Indirect Effects

The PRB FEIS discussed impacts to big game animals from CBNG and oil development on pp. 4-181 to 4-215. Big game would likely be displaced from the project area during drilling and construction. A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). The WGFD indicates a well density of 8 wells per section creates a high level of impact for big game and that avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004). A multi-year study on the Pinedale Anticline suggests not only do mule deer avoid mineral activities, but after 3 years of drilling activity the deer have not become accustomed to the disturbance (Madson 2005).

Big game animals are expected to return to the project area following construction; however, populations will likely be lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and, as the Pinedale Anticline study suggests, mule deer do not readily habituate. A study in North Dakota stated, “Although the population (mule deer) had over seven years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic” (Lustig 2003). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

Reclamation activities that occur in big game habitats during the spring will likely displace does and fawns due to the human presence in the area. This may cause reduced survival rate of does and fawns that must expend increased energies to avoid such activities.

4.4.1.4.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pg. 4-181 to 4-215.

4.4.1.4.3. Mitigation Measures

No mitigation is proposed with Alternative B.

4.4.1.4.4. Residual Impacts

No residual impacts area anticipated.

4.4.1.5. Migratory Birds

4.4.1.5.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to migratory birds, pp. 4-231 to 4-235. Disturbance of habitat in the project area is likely to impact migratory birds. Native habitats will be lost directly with the construction of wells, roads, and pipelines. Reclamation and other activities that occur in the spring may be detrimental to migratory bird survival. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. Drilling and construction noise can be troublesome for songbirds by interfering with the males’ ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003).

Habitat fragmentation will result in more than just a quantitative loss in the total area of habitat available; the remaining habitat area will also be qualitatively altered (Temple and Wilcox 1986). Ingelfinger (2004) identified that the density of breeding Brewer’s sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 m of dirt roads in a natural gas field. Effects occurred along roads with light traffic volume (less than 12 vehicles per day). The increasing density of roads constructed in developing

natural gas fields exacerbated the problem creating substantial areas of impact where indirect habitat losses through displacement were much greater than the direct physical habitat losses.

Those species that are edge-sensitive will be displaced further away from vegetative edges due to increased human activity, causing otherwise suitable habitat to be abandoned. If the interior habitat is at carrying capacity, then birds displaced from the edges will have no place to relocate. One consequence of habitat fragmentation is a geometric increase in the proportion of the remaining habitat that is near edges (Temple 1986). In severely fragmented habitats, all of the remaining habitat may be so close to edges that no interior habitat remains (Temple and Cary 1988). Over time, this leads to a loss of interior habitat species in favor of edge habitat species. Other migratory bird species that utilize the disturbed areas for nesting may be disrupted by the human activity, and nests may be destroyed by equipment.

Migratory bird species in the PRB nest in the spring and early summer and are vulnerable to the same effects as sage-grouse and raptor species. Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where sage-grouse or raptor nesting timing limitations are applied, nesting migratory birds are also protected. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable.

4.4.1.5.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, p. 4-235. No additional mitigation measures are required.

4.4.1.5.3. Mitigation Measures

No timing limitations on surface disturbing activities are proposed specifically for migratory birds. However, raptor and sage-grouse timing limitations on surface disturbing activities will also serve to mitigate impacts to nesting migratory birds.

4.4.1.5.4. Residual Effects

Sage-grouse timing limitations will apply to the entire project. Those migratory bird species and individuals that are still nesting when the sage-grouse timing limitations are over (June 30) may have nests destroyed, or be disturbed, by construction activities. Protections around active raptor nests (Feb 1- July 31) extend past most migratory bird nesting seasons. Only a percentage of known nests are active any given year, so the protections for migratory birds from June 30 - July 31 will depend on how many raptor nests area active.

4.4.1.6. Raptors

4.4.1.6.1. Direct and Indirect Effects

Direct and indirect impacts to raptors, from oil and gas development, are analyzed in the PRB FEIS (pp. 4-216 to 4-221). Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If mineral activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to overheating or chilling of eggs or chicks and can result in egg or chick mortality. Prolonged disturbance can also lead to the abandonment of the nest by the adults. Routine human activities near these nests can also draw increased predator activity to the area, resulting in increased nest predation.

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests and recommends all infrastructure requiring human visitation be located in such a way as to provide adequate biologic buffer for nesting

raptors. A biologic buffer is a combination of distance and visual screening that provides nesting raptors with security such that they will not be flushed by routine activities.

The 34-28 well, and access road from the 13-28 well, is proposed within 0.34 miles of nest #12625. The well is in full view (line of sight) of the nest. Red-tailed hawks occupied the nest in 2011, and 0.34 miles is likely an adequate distance to reduce the chance of nest failure or abandonment. It is possible that the individuals using the nest are relatively tolerant to human disturbance given the proximity of the nest to an existing homestead. However, activities, such as drilling and workover operations, are expected to be more invasive than the day to day activities that may occur at the ranch.

Nest #2107 was likely built by ferruginous hawks and occurs approximately 0.3 miles from the proposed 12-5 well location. The nest was reported in remnant condition in 2011 (WLS 2011). It is unlikely that ferruginous hawks will attempt to rebuild the nest given its proximity to existing gas development.

4.4.1.6.2. Cumulative Effects

The cumulative effects associated with Alternatives B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pg. 4-221.

4.4.1.6.3. Mitigation Measures

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a nest survey and a 0.5 mile radius timing limitation during the breeding season around active raptor nests per the RMP.

4.4.1.6.4. Residual Impacts

Even with a timing limitation, raptors may abandon nests due to alteration in foraging habitats associated with development or because of sensitivity to well or infrastructure placement. Declines in breeding populations of some species that are more sensitive to human activities may occur.

4.4.1.7. Plains Sharp-tailed Grouse

4.4.1.7.1. Direct and Indirect Effects

Direct and indirect impacts to sharp-tailed grouse, from oil and gas development, are analyzed in the PRB FEIS (pp. 4-221 to 4-225).

4.4.1.7.2. Cumulative Effects

The cumulative effects associated with Alternatives B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pp. 4-225 to 4-226.

4.4.1.7.3. Mitigation Measures

No mitigation is proposed with Alternative B specifically for sharp-tailed grouse. However, where timing limitations for sage-grouse are applied, sharp-tailed grouse will also be protected.

4.4.1.7.4. Residual Impacts

A timing limitation does nothing to mitigate loss and fragmentation of habitat or changes in disease mechanisms. Suitability of the project area for sharp-tailed grouse will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with oil and gas development.

4.4.2. Cultural Resources

4.4.2.1. Direct and Indirect Effects

The class III cultural inventory for the GDU Federal 13-28 pipeline (BFO# 70110083) occurred, apparently, after the majority of the surface disturbance. The NEPA effects analysis was not complete when the likely surface disturbance occurred and the disturbance resulted in Ballard's apparent noncompliance with Section 106 of NHPA

No historic properties will be impacted by the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the BLM electronically notified the Wyoming SHPO on August 16, 2011 that no historic properties exist in the area of project effects. If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the Standard COA (General)(A)(1).4.5.2. Cumulative Effects

Construction and development of oil and gas resources impacts cultural resources through ground disturbance, unauthorized collection, and visual intrusion of the setting of historic properties. This results in fewer archaeological resources available for study of past human life-ways, changes in human behavior through time, and interpreting the past to the public. Additionally, these impacts may compromise the aspects of integrity that make a historic property eligible for the National Register of Historic Places. Recording and archiving basic information about archaeological sites and the potential for subsurface cultural materials in the proposed project area serve to partially mitigate potential cumulative effects to cultural resources.

Fee actions constructed in support of federal actions can result in impacts to historic properties. Construction of large plans of coalbed natural gas development on split estate often include associated infrastructure that is not permitted through BLM. Project applicants may connect wells draining fee minerals, or previously constructed pipelines on fee surface with a federal plan of development. BLM has no authority over such development which can impact historic properties. BLM has the authority to modify or deny approval of federal undertakings on private surface, but that authority is limited to the extent of the federal approval. Historic properties on private surface belong to the surface owner and they are not obligated to preserve or protect them. The BLM may go to great lengths to protect a site on private surface from a federal undertaking, but the same site can be legally impacted by the landowner at any time. The cumulative effect of numerous federal approvals can result in impacts to historic properties. Archeological inventories reveal the location of sites and although the BLM goes to great lengths to protect site location data, information can potentially get into the wrong hands. BLM authorizations that result in new access can inadvertently lead to impacts to sites from increased visitation by the public.

4.4.2.2. Mitigation Measures

Without adequate class III cultural inventory prior to ground disturbing activities, as was the case for the GDU Federal 13-28 pipeline, mitigation measures cannot be formulated and undocumented historic resources can be adversely affected.

If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS) and ROD, pp. A-19 to A-20] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the Standard COA (General)(A)(1).

When a project is constructed in an area with a high potential for buried cultural material, archaeological monitoring is often included as a condition of approval. Construction monitoring is performed by a qualified archeologist working in unison with construction crews. If buried cultural resources are located by the archeologist, construction is halted and the BLM consults with the State Historic Preservation

Office (SHPO) on mitigation or avoidance. Due to the presence of alluvial deposits identified by the NRCS soil survey (NRCS n.d.), and the BLM archaeologist during the onsite inspection, the operator will be required to have an archeologist monitor all earth moving activities associated with certain construction, as described in the site specific COA's.

4.4.2.3. Residual Effects

During the construction phase, there will be numerous crews working across the project area using heavy construction equipment without the presence of archaeological monitors. Due to the extent of work and the surface disturbance caused by large vehicles, it is possible that unidentified cultural resources can be damaged by construction activities. The increased human presence associated with the construction phase can also lead to unauthorized collection of artifacts or vandalism of historic properties.

5. CONSULTATION/COORDINATION:

Contact	Title	Organization	Present at onsite
Michael Perius	Operations Superintendant	Ballard Petroleum	Y
Gerry Geis	Surface Owner		Y
Chuck Tweedy	Surface Owner		Y
Brad Rogers	Wildlife Biologist	USFWS	Y
Mary Hopkins	Wyoming SHPO	Wyoming SHPO	N

6. REFERENCES AND AUTHORITIES:

The National Environmental Policy Act of 1969 (NEPA), as amended (Pub. L. 91-90, 42 U.S.C. 4321 et seq.).

Code of Federal Regulations (CFR)

- 40 CFR All Parts and Sections inclusive Protection of Environment Revised as of July 1, 2001.
- 43 CFR All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2000.

U.S. Department of the Interior, Bureau of Land Management and Office of the Solicitor (editors). 2001. The Federal Land Policy and Management Act, as amended. Public Law 94-579.

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Appendix A: RECLAMATION REQUIREMENTS, WY BLM

The following Reclamation Requirements apply to all surface disturbing activities, including BLM initiated activities, and must be addressed in each reclamation plan. These requirements also must be met prior to release of the bond and/or the reclamation liability. Where these Reclamation Requirements differ from other applicable federal, laws, rules, and regulations, those requirements supersede this policy. State and/or local statutes or regulations may also apply.

- 1. Manage all waste materials:**
 - a. Segregate, treat, and/or bio-remediate contaminated soil material.
 - b. Bury only authorized waste materials on site. Buried material must be covered with a minimum of three feet of suitable material or meet other program standards.
 - c. Ensure all waste materials moved off-site are transported to an authorized disposal facility.
- 2. Ensure subsurface integrity, and eliminate sources of ground and surface water contamination.**
 - a. Properly plug all drill holes and other subsurface openings (mine shafts, adits etc.).
 - b. Stabilize, properly back fill, cap, and/or restrict from entry all open shafts, underground workings, and other openings.
 - c. Control sources of contamination and implement best management practices to protect surface and ground water quality.
- 3. Re-establish slope stability, surface stability, and desired topographic diversity.**
 - a. Reconstruct the landscape to the approximate original contour or consistent with the land use plan.
 - b. Maximize geomorphic stability and topographic diversity of the reclaimed topography.
 - c. Eliminate highwalls, cut slopes, and/or topographic depressions on site, unless otherwise approved.
 - d. Minimize sheet and rill erosion on/or adjacent to the reclaimed area. There shall be no evidence of mass wasting, head cutting, large rills or gullies, down cutting in drainages, or overall slope instability on/or adjacent to the reclaimed area.
- 4. Reconstruct and stabilize water courses and drainage features.**
 - a. Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in nearby naturally functioning basins.
 - b. Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in stable naturally functioning systems.
- 5. Maintain the biological, chemical, and physical integrity of the topsoil and subsoil** (where appropriate).
 - a. Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site specific soil evaluation, including depth, chemical, and physical characteristics.
 - b. Protect all stored soil material from erosion, degradation, and contamination.
 - c. Incorporate stored soil material into the disturbed landscape.
 - d. Seed soils to be stored beyond one growing season, with desired vegetation.
 - e. Identify stockpiles with appropriate signage.
- 6. Prepare site for revegetation.**
 - a. Redistribute soil materials in a manner similar to the original vertical profile.
 - b. Reduce compaction to an appropriate depth (generally below the root zone) prior to redistribution of topsoil, to accommodate desired plant species.

- c. Provide suitable surface and subsurface physical, chemical, and biological properties to support the long term establishment and viability of the desired plant community.
 - d. Protect seed and seedling establishment (e.g. erosion control matting, mulching, hydro-seeding, surface roughening, fencing, etc.)
7. **Establish a desired self-perpetuating native plant community.**
- a. Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community.
 - b. Enhance critical resource values (e.g. wildlife, range, recreation, etc.), where appropriate, by augmenting plant community composition, diversity, and/or structure.
 - c. Select genetically appropriate and locally adapted native plant materials based on the site characteristics and ecological setting.
 - d. Select non-native plants only as an approved short term and non-persistent alternative to native plant materials. Ensure the non-natives will not hybridize, displace, or offer long-term competition to the endemic plants, and are designed to aid in the re-establishment of native plant communities.
8. **Reestablish complementary visual composition**
- a. Ensure the reclaimed landscape features blend into the adjacent area and conform to the land use plan decisions.
 - b. Ensure the reclaimed landscape does not result in a long term change to the scenic quality of the area.
9. **Manage Invasive Plants**
- a. Assess for invasive plants before initiating surface disturbing activities.
 - b. Develop an invasive plant management plan.
 - c. Control invasive plants utilizing an integrated pest management approach.
 - d. Monitor invasive plant treatments.
10. **Develop and implement a reclamation monitoring and reporting strategy.**
- a. Conduct compliance and effectiveness monitoring in accordance with a BLM (or other surface management agency) approved monitoring protocol.
 - b. Evaluate monitoring data for compliance with the reclamation plan.
 - c. Document and report monitoring data and recommend revised reclamation strategies.
 - d. Implement revised reclamation strategies as needed.
 - e. Repeat the process of monitoring, evaluating, documenting/reporting, and implementing, until reclamation goals are achieved.