**DECISION RECORD**
**Wesco Operating Inc., Federal 5-22 Vertical Oil well**
**Environmental Assessment (EA), WY-070-EA13-26**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**DECISION.** The BLM approves Wesco Operating Inc. (Wesco), Federal 5-22 Vertical Oil well application for permit to drill (APD) as described in Alternative B of this environmental assessment. This approval includes the well's support facilities.

**Compliance.** This decision complies with:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701); DOI Order 3310.
- Mineral Leasing Act of 1920 (MLA) (30 U.S.C. 181); to include Onshore Order No. 1.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Buffalo Resource Management Plan (RMP) 1985, Amendments 2001, 2003, 2011.

BLM summarizes the details of the approval of Alternative B, below. The EA includes the project description, including specific changes made at the onsites, and site-specific mitigation measures.

**Well Site.** BLM approves the following APD and support facilities:

| | Well Name | Well # | Qtr/Qtr | Section | TWP | RNG | Lease # |
|---|---|---|---|---|---|---|---|
| 1 | Federal | 5-22 | SENW | 5 | 46N | 70W | WYW117508 |

**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 this project EA and the FONSI (incorporated here by reference) found Wesco's proposal for this oil well will have no significant impacts on the human environment, beyond those described in the PRB FEIS. There is no requirement for an Environmental Impact Statement.

**COMMENT OR NEW INFORMATION SUMMARY.** BLM publically posted the proposed APD for 30 days, received no comments, and then internally scoped it. BLM experience in the PRB (outside of the Fortification Creek Planning Area) revealed little public input or new issue discovery other than those revealed after public scoping during development of the PRB FEIS.

**DECISION RATIONALE**. BLM bases the decision authorizing the selected project on:

1. BLM and the operator, included mitigation measures to reduce environmental impacts while meeting the project's need. For a complete description of all site-specific COAs; see the COAs. The PRB FEIS analyzed and predicted that the PRB oil and gas development would have significant impacts to the region's Greater Sage-Grouse (GSG) population. The impact of this development cumulatively contributes to the potential for local extirpation yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS and ROD and current BLM and Wyoming GSG conservation strategies.
2. The operator will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice.
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 the approved APD, applicable laws, regulations, orders, and notices to lessees.

- Obtain necessary permits from agencies.
- Offer water well agreements to the owners of record for permitted wells.
- Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.

5. The operator certified it has a surface access agreement or posted a 43 CFR 3814.1 bond.
6. The project is clearly lacking in wilderness characteristics as it lacks federally owned surface.
7. This APD is pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas and does not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because the proposed well is in a developed field supported by a NEPA document older than 5 years from the date possible to spud this well.

**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. Parties 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: 12/20/12

**FINDING OF NO SIGNIFICANT IMPACT**
**Wesco Operating Inc., Federal 5-22 Vertical Oil Well, Plan of Development (POD)**
**Environmental Assessment (EA), WY-070-EA13-26**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**FINDING OF NO SIGNIFICANT IMPACT (FONSI).** Based on the information in the EA, which BLM incorporates here reference; I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those 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, 2011); 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 consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR 1508.27), with regard to the context and to the intensity of the impacts described in the EA, and Interior Department Order 3310.

**CONTEXT:** Mineral development is a common PRB land use, sourcing over 42% of the nation's coal. The PRB FEIS foreseeable development analyzed the development of 54,200 wells. The additional development analyzed in Alternative B is insignificant in 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.

BLM 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 and gas 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. The proposal may relate to the PRB Greater Sage-Grouse and its habitat decline having cumulative significant impacts; yet the small size of this project is within the parameters of the impacts in the PRB FEIS. 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 lacks federally owned 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. Parties adversely affected by the State Director's finding may appeal that finding to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager: _____ Date: 12/20/12

**ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA13-26**
**Wesco Operating Inc., Federal 5-22 Vertical Oil Well, Plan of Development (POD),**
**Bureau of Land Management, Buffalo Field Office, Wyoming**

# 1. INTRODUCTION

BLM provides this EA for Wesco Operating Inc. (Wesoco), Federal 5-22 vertical oil well application for permit to drill (APD). 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, 2003and 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. This APD is pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because the proposed well is in a developed field not supported by a NEPA document less than 5 years from the date possible to spud this well.

Congress made a 4-part process for federal fluid mineral decisions under the long-term needs of multiple-use. First is the land use / resource management plan (RMP); here the PRB FEIS and ROD amendment to the BFO RMP. Second are the decisions of whether and, if so, under what conditions, to lease lands for fluid mineral development. Courts held leasing decisions are an almost irrevocable resource commitment. Third, (this phase) is deciding on the proposed POD or APD, or both: the site-specific analysis, and mitigation. Fourth is the monitoring and reclamation of wells and their features. (Pendery 2010)

## 1.1. Background

Wesco submitted a notice of staking (NOS) on May 14, 2012, under which the onsite inspection was conducted on September 6, 2012. The operator submitted the APD September 17, 2012. The well is near a developed, producing oil facility, the Federal D-3, to which this project will tie. Produced water and hydrocarbons will be pumped to this existing location. Power for the 5-22 well will also come from the D-3 location. This proposed well is in the midst of existing oil and gas development. The operator plans to drill at least 2 more oil wells in the area, in the near future. Other private, state, and federal wells are also like to be drilled by various operators in the foreseeable future.
Existing wells within a 1 mile radius of this well include:

1. One water well
2. 11 abandoned oil wells
3. 2 producing oil wells
4. One shut-in oil well
5. One water injection well

## 1.2. Need for the Proposed Project

The need for this project is to determine whether, how, and under what conditions to support the Buffalo Resource Management Plan's (RMP) goals, objectives, and management actions (2003 Amendment) with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. APD information is an integral part of this EA, which BLM incorporates here by reference (CFR 1502.21). Conditional fluid mineral development supports the RMP and 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 agreeing with the Bureau's multiple use mandate, environmental protection, and RMP.

### 1.4. Scoping and Issues

BLM publically posted the APD for 30 days and will timely publish the EA on the BFO website: http://www.blm.gov/wy/st/en/field_offices/Buffalo.html. 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 the BFO analyzed. External scoping is unlikely to identify new issues, as verified with recent fluid mineral EAs BLM recently externally scoped. External scoping of the horizontal drilling in Samson Resources EA, WY-060-EA11-181, 2011, in the PRB area received 2 comments, revealing no new issues. External scoping in 2010 and 2011 for the Fortification Creek amendment revealed no new issues outside of geographically-specific ones.

The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposed development and project location to identify potentially affected resources and land uses. 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. The analysis area clearly lacks wilderness characteristics as it is amidst oil and gas development. The US Geological Survey determined there is a remote likelihood of a measureable or damaging induced seismic event from hydraulic fracturing or water injection at low volumes. Project issues include:

- Air quality
- Soils and vegetation: site stability, reclamation potential, riparian and wetland communities, invasive species
- Water: ground water; quality and quantity of produced water.
- Wildlife: raptor productivity, migratory birds, special status species
- Cultural

These issues are not present, or minimally so. BLM analyzed them in the PRB FEIS and in this EA:

| | | |
|---|---|---|
| Geological resources | Paleontological resources | Livestock & grazing |
| Cave and karst resources | Visual resources | Wilderness characteristics |
| Mineral resources: locatable, leasable-coal, salable | Forest products | Areas of critical environmental concern |
| Fire, fuels management, and rehabilitation | Lands & realty | Socio-economic resources |
| Surface water | Rights of way & corridors | Environmental justice |
| Recreation | Transportation & access | Tribal treaty rights |

## 2. PROPOSED PROJECT AND ALTERNATIVES

### 2.1. Alternative A – No Action

The PRB FEIS considered a No Action Alternative, pp. 2-54 to 2-62. This alternative must also consider and aggregate the effects analyzed in the PRB FEIS analysis. The total number of conventional wells approved by BFO is 359, which includes 193 horizontal wells (as of March 2012). The WOGCC permitted 103 wells. The total is 453, which represents 14% of the projected 3,200 in the 2003 PRB ROD. (See Disturbance Summary Table below for an approximation of the disturbance in the current situation.) This agrees with the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of over 51,000 coal bed natural gas (CBNG) and 3,200 natural gas and oil wells. This alternative would not approve this proposed well. This alternative would deny this APD requiring the operator to resubmit an APD that complies with statutes and the reasonable measures in the PRB RMP Record of Decision (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. It is not possible in the abstract to identify every interest and that is beyond the scope here.

### 2.2. Alternative B Proposed Action (Proposal)

**Overview:** Wesco proposes drilling and developing 1 vertical oil well into federal mineral estate from a non-federal location. Thunder Basin Coal Company, LLC is the surface owner of the proposed project. A proposed access road of 120 feet will be constructed. The proposed well is 20 miles north of Wright, Campbell County Wyoming. The primary objective is to drill to the Mowry/Muddy SS Formation at 8,512 feet, total vertical distance. Topography in the area is gently rolling hills and gradually sloping drainages. Elevations in the area range from 4,560 to 4,660 feet above sea level. Climate is semi-arid, averaging 11.9 inches of precipitation annually. Existing land uses in the area include oil, gas, coal production as well as livestock and wildlife production. The operator plans to drill at least 2 more oil wells in the near future. Other operators are also expected to drill additional private, state and federal wells in the area.

**Project Name/Surface location:**

| Well Name & Number | QTR | SEC | TWN | RNG | Lease # | Status |
|---|---|---|---|---|---|---|
| Federal 5-22 | SENW | 5 | 46N | 70W | WYW117508 | APD |

**Drilling, Construction and Production Design Features Include:**

- The operator 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 existing improved roads and a proposed road.
- An existing above ground power line network.
- A pipeline connecting this well to an existing oil well pipeline. The pipeline will follow an existing road.
- Potential production facilities including a pumping unit, a 4 tank battery, a heater treater located on the well pad and placed on the cut portion of the location, a minimum of 20 feet from the toe of the back cut, a flare pit.
- Produced hydrocarbons will be pumped in a buried pipeline 1,500 feet to the west, to the existing D-3 location.
- Produced water will be pumped in a buried pipeline to the Amkirk 3-I-6 water injection facility.
- Water needed for the drilling and production of this well will come from the Fox Hills formation from the existing 1-N-19 water well located in the SESW Section 19, T47N R70W. Approximately 8,500 barrels of water will be hauled to the location on existing and proposed roads by water trucks.
- There is a small possibility that this well will need to be hydraulically fractured. If so, the operator will follow approved fracturing regulations and procedures.
- All engines will be equipped with an adequate muffler system, decibel level not to exceed 70 decibels at a distance of 200 feet from the exhaust of any muffler.
- No pits at the producing oil well location.

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 APD. Also see the subject APD for maps showing the proposed well location and associated facilities described above.

**Table 2.1. Disturbance Summary for Federal 5-22 well:**

| Facility | Number or Miles | Factor | Disturbance |
|---|---|---|---|
| Proposed Pad | 1 | 125,017 sq ft | 2.9 acres |
| Proposed Roads | 1 (120 ft x 50ft) | 6,000 sq ft | 0.14acres |
| Existing Improved Road Corridor | 0.6 miles | 144,00 sq ft | 3.3 acres |
| Proposed Pipeline (in existing road corridor | 1 (1,600 ft x 2 ft) | 3,200 sq ft | 0.08 acres |
| Proposed Underground Power (in existing road corridor) | 1 (1,600 ft x 2 ft) | 3,200 sq ft | 0.08acres |
| **Total Surface Disturbance** | | | **3.3 acres** |

During the production/interim reclamation stage, the location working area will be reduced from 2.9 acres to approximately 1.7 acres.

BLM incorporated and analyzed the implementation of committed mitigation measures in the SUP and drilling plan, in addition to the COAs in the PRB FEIS ROD, as well as changes made at the onsite.

Additionally, the operator, in their APD, committed to:
1. Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
2. Obtain necessary permits from agencies.
3. Offer water well agreements to the owners of record for permitted wells.
4. Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.
5. Certify it has a surface access agreement with the landowner or posted a 43 CFR 3814.1 bond.

Operator estimates that during the drilling, completion and production phases of each individual well (about a 4 to 5 week period per well) the average daily truck traffic to and from the location is approximately 3 large trucks (water haulers, cement trucks, etc.) and 7 personal pickup trucks per day. During the production phase, a large oil tanker truck would haul oil approximately every 3 days and daily pickup trips would be reduce to 1 per day.

The reasonably foreseeable development for this and adjacent areas includes at least 1 more Wesco oil well. Other private, state, and federal oil, gas and CBNG wells and their infrastructure such as gathering transportation pipelines storage, roads, compression, and electrical power may be added.

### 2.3. 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 generally conforms to the terms and conditions of that land use plan, its amendments, and supporting FEISs, 1985, 2003.

## 3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment affected by the alternatives in Section 2. Aspects of the affected environment here focus on the major issues. Find a screening of all resources and land uses potentially affected in administrative record. Resources unaffected, or not affected beyond the level analyzed in the PRB FEIS, are outside this EA's scope**.** The Wyoming Game and Fish Department's (WGFD's) Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (2009), make no distinction between surface disturbance impacts per well type or drilling technology. BLM's position is there is a rare lack of distinction in surface disturbance

impacts attributable to well type, subject to showing a distinction, not a mere difference, and this tracks to surface disturbance issues as with soils, vegetation, invasive species, wetlands, cultural resources, etc. See, State Director Reviews WY-2010-023, Part 2, p. 3, and fn. 7, and WY-2013-005, pp. 2-3. This supports national policy where no distinction exists in 43 CFR 3160 et. seq, APD Form 3160-3, leasing, and 2005's Energy Policy Act. (Kreckel 2007). Stanolind Oil and Gas Corporation developed hydraulic fracturing in 1947. The industry improved the process, along with drilling and completion technologies to where hydraulic fracturing is economical and developed over 1 million US wells. Virtually all the PRB's CBNG and 60-70% of the oil and deep gas wells received hydraulic fracturing. (Goolsby 2012). Wesco does not know if they will need to use hydraulic fracturing for this well, until drilling is completed. If hydraulic fracturing is used, the operator will follow approved fracturing policies and procedures.

### 3.1. Air Quality

Refer to the PRB FEIS pp. 3-291 to 3-299, for a 2003-era description of the air quality conditions. BLM incorporates by reference, Update of Task 3A Report for the Powder River Basin Coal Review Cumulative Air Quality Effects for 2020, BLM (AECOM), 2009, (Cumulative Air Quality Effects, 2009) as it captures the cumulative air quality effects of present and projected PRB fluid and solid mineral development. WDEQ assumed primacy from U.S. Environmental Protection Agency for maintaining Wyoming's air quality. The Environmental Protection Agency (EPA) established ozone standards in 2008, finalizing them in 2011. Existing air quality in the PRB is "unclassified/attainment" with all ambient air quality standards. It is also in an area that is in prevention of significant deterioration zone.

PRB air quality is a rising concern due to ozone in the oil and gas producing Upper Green River Basin that became 1 of the nation's 40 "nonattainment" zones for ozone in 2012; in addition to PRB-area air quality alerts issued in 2011 and 2012 for particulate matter (PM), attributed to coal dust. Four sites monitor the air quality in the PRB: Cloud Peak in the Big Horn Mountains, Thunder Basin northeast of Gillette, Campbell County south of Gillette, and Gillette. In addition, the Wyoming Air Resource Monitoring System (WARMS) measures meteorological parameters from 6 sites, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (3 locations). These sites are at Sheridan, Taylor Reservoir, South Coal Reservoir, Buffalo, Juniper, and Newcastle. The northeast Wyoming visibility study is ongoing by the Wyoming Department of Environmental Quality (WDEQ). Sites adjacent to the Wyoming PRB-area are at Birney on the Tongue River 24 miles north of the Wyoming-Montana border, Broadus on the Powder River in Montana, and Devils Tower.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrogen oxides (NOx)) 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;
- PM (dust) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas, road sanding during the winter months, coal mines, and trains;
- Transport of air pollutants from emission sources located outside the region;
- NOx, PM, and other emissions from diesel trains and,
- SO2 and NOx from power plants.

### 3.2. Soils and Vegetation

Project area soils developed in alluvium and residuum derived mainly from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams resulting in a wide variety of surface and subsurface textures. Soil depths vary from deep on lesser slopes to shallow and very shallow on steeper slopes. Differences in lithology produced topographic and geomorphic variations in the area. An erosion resistant cap of clinker, terrace gravels, or sandstone often protects ridges and hills. Parent material chemistry may result in local concentration of salts.

Soils differ with topographic location, slope, and elevation. Topsoil depths available for reclamation range from none too shallow on ridges to 12+ inches in bottomland. Erosion potential varies depending on the soil type, vegetative cover, and slope. Reclamation potential of soils also varies throughout the project area. The area main soil limitations include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

The Campbell County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database WY605 provides detailed soils identification and data. NRCS performed the soil survey according to National Cooperative Soil Survey standards. The BLM uses county soil survey information to predict soil behavior, limitations, or suitability for a given activity or action. The agency's long term goal for soil resource management is to maintain, improve, or restore soil health and productivity, and to prevent or minimize soil erosion and compaction. Soil management objectives are to ensure that adequate soil protection is consistent with the resource capabilities. Many of the soils and landforms of this area present distinct challenges for development, and /or eventual site reclamation. See the NRCS Soil Survey (SSURGO) data. The Ecological Site interpretations include additional site-specific soil information.

### 3.3. Soils Susceptible to Erosion

Soil formation is a very slow process. Most soils cannot renew their eroded surface and productivity while erosion continues. The development of a favorable rooting zone by the weathering of parent rock is much slower than development of the surface horizon. One estimate of this renewal rate is 0.5 ton per acre per year for unconsolidated parent materials and much less for consolidated materials. These very slow renewal rates support the philosophy that any soil erosion is too much. Loss of organic matter, resulting from erosion and tillage, is one of the primary causes for reduction in production yields. When organic matter decreases, soil aggregate stability, the soil's ability to hold moisture, and the cation exchange capacity decline. (Soil Quality-Agronomy Technical Note #7, USDA, Aug 1998)

### 3.4. Vegetation and Ecological Sites

BLM staff identified the dominant vegetation community types in the project area are mixed-grass prairie and sagebrush shrubland. Species typical of these community types are: Western wheatgrass, prairie junegrass, Sandberg bluegrass, blue grama, green needlegrass, pricklypear cactus, Wyoming big sagebrush, and cheatgrass. The project area is a Loamy Ecological Site and the major plant community identified in the project area is Mixed Sagebrush/Grass Plant Community. This site occurs on gently undulating rolling land. Landform: Hill sides, alluvial fans, ridges & stream terraces.

The soils of this site are deep to moderately deep (greater than 20 inches to bedrock), well drained and moderately permeable. Layers of the soil most influential to the plant community varies from 3 to 6 inches thick. These layers consist of the A horizon with very fine sandy loam, loam, or silt loam texture and may also include the upper few inches of the B horizon with sandy clay loam, silty clay loam or clay loam texture. The main soil limitations include: low organic matter content and soil droughtiness. The low annual precipitation should be considered when planning a seeding.

**Mixed Sagebrush/Grass Plant Community**

This mixed sagebrush/grass community is under moderate, season-long livestock grazing in the absence of fire or brush management. Wyoming big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grasses, and miscellaneous forbs. Dominant grasses may include needleandthread, western wheatgrass, and green needlegrass. Grasses of secondary importance include blue grama, prairie junegrass, and Sandberg bluegrass. Forbs commonly found in this plant community include plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Sagebrush canopy ranges from 20% to 30%. Fringed sagewort is commonly found. Plains pricklypear also occurs.

When compared to the Historic Climax Plant Community, sagebrush and blue grama have increased. Production of cool-season grasses, particularly green needlegrass, has been reduced. The sagebrush canopy protects the cool-season mid-grasses, but this protection makes them unavailable for grazing. Cheatgrass (downy brome) has invaded the site. The overstory of sagebrush and understory of grass and forbs provide a diverse plant community that will support domestic livestock and wildlife such as mule deer and antelope. This plant community is resistant to change. A significant reduction of big sagebrush can only be accomplished through fire or brush management. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

### 3.5. Water Resources

WDEQ assumed primacy from U.S. Environmental Protection Agency for maintaining Wyoming's water quality. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting impoundments for the containment of the State's surface waters. The Wyoming Oil and Gas Conservation Commission (WYOGCC) has authority for permitting and bonding off channel pits located over state and fee minerals.

#### 3.5.1. Groundwater

The area's historical use for groundwater was for stock or domestic water. The operator's MSUP for the 5-22 well states there is 1 water well within 1 mile of the proposed 5-22 well. Area water wells' depths are 220 and 233 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36.

### 3.6. Wetlands/Riparian

No wetlands or riparian areas are within 300 feet of areas of proposed soil disturbance for the construction of the 5-22 well pad, 120 feet of access road, and the 1,600 feet of pipeline to the D-3 tank battery. The Belle Fourche River is approximately 1.5 miles north of the well location.

### 3.7. Invasive Species

The project proponent discovered no state-listed noxious weeds and invasive/exotic plant infestations by a search of inventory maps and/or databases or during subsequent field investigation except for small amounts of cheatgrass. Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. These 2 species are found in high densities and numerous locations throughout NE Wyoming. Research shows that surface disturbances are a leading cause of cheatgrass proliferation and that this species is partly responsible for greater frequency and severity of wildfires in semi-arid regions.

### 3.8. Fish and Wildlife

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. BLM, Wyoming Department of Game and Fish (WDGF), and US Fish & Wildlife Service (FWS) wildlife biologists performed a habitat assessment in the project area on September 6, 2012. The biologists evaluated impacts to wildlife resources and recommended project modifications where wildlife issues arose. BLM also consulted databases compiled and managed by BLM BFO wildlife staff, the PRB FEIS, WGFD datasets, and the Wyoming Natural Diversity Database (WYNDD) to evaluate the affected environment for wildlife species that may occur in the project area. This section describes the affected environment for only those wildlife likely to occur in the area that may be impacted by the proposal.

#### 3.8.1. Big Game

The big game species occurring in the project area are mule deer, pronghorn, and elk. The WYDGF has mapped the area as yearlong range for mule deer and winter yearlong for pronghorn. Elk from the Rochelle Hills herd occupy the area at times but the area has not been mapped by WDGF as occupied range. The mule deer in the WDGF management zone covering the project area are below population

objectives. Pronghorn populations are currently above population objectives for the herd management area and pronghorns were observed during the onsite visit. The PRB FEIS discussed the affected environment for pronghorn, mule deer, white-tailed deer, and elk on pp. 3-117 to 3-122, pp. 3-127 to 3-132, 3-122 to 3-127, and 3-132 to 3-140, respectively.

### 3.8.2. Raptors

The PRB FEIS discussed the affected environment for raptors, pp. 3-141 to 3-148. ICF International identified 1 raptor nest site within 0.5 miles of the project boundary (ICF International 2012). The nest has not been active since 2006. Most raptor species nest in a variety of habitats including (but not limited to): native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, and tree cavities. Suitable nesting habitat is present in the project area.

### 3.8.3. Migratory Birds

Migratory birds are birds that migrate for breeding and foraging at some point in the year. The BLM-Fish and Wildlife Service (FWS) Memorandum of Understanding (MOU) (2010) promotes the conservation of migratory birds, complying with 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 Migratory Bird Treaty Act (MBTA). The MBTA (and Bald and Golden Eagle Protection Act (BGEPA)) are strict liability statutes so require no intent to harm migratory birds through prosecuting a taking. A wide variety of migratory birds may be found in the proposed project area at some time throughout the year. Many species that are of high management concern use shrub-steppe and shortgrass prairie areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds 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 3 groups of high-priority bird species in Wyoming: Level I – those that clearly need conservation action, Level II – species where the focus is on monitoring, rather than active conservation, and Level III – species that are not a high priority but are of local interest. (Shrub-steppe vegetation dominates the project area.(use or vary to fit the project area) Many species that are of high management concern use shrub-steppe areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds declined more consistently in the last 30 years than any other ecological association of birds (WGFD 2009). Species that may occur in these vegetation types in northeast Wyoming, according to the Wyoming Bird Conservation Plan, appear Table 3.1, grouped by level as identified in the plan. Several migratory species are also BLM special status (sensitive) species. Those suspected to occur in the project area including: *Brewer's sparrow, loggerhead shrike, and sage thrasher*. The PRB FEIS discussed the affected environment for migratory birds on pp. 3-150 to 3-153.

**Table 3.1. Migratory Birds Occurring in Shrub-steppe Habitat, NE Wyoming (Nicholoff 2003)**

| Level | Species | Wyoming BLM Sensitive |
|---|---|---|
| Level I | Brewer's sparrow | Yes |
| | Ferruginous hawk | Yes |
| | McCown's longspur | No |
| Level II | Lark bunting | No |
| | Lark sparrow | No |
| | Loggerhead shrike | Yes |
| | Sage thrasher | Yes |
| | Vesper sparrow | No |
| Level III | Common poorwill | No |
| | Say's phoebe | No |

### 3.8.4. Threatened, Endangered, Candidate, Special Status (Sensitive) Species

The FWS currently lists two threatened, endangered and candidate species that occur or may occur in Campbell County, the Ute Ladies'-tresses orchid (threatened) and the Greater Sage-grouse (candidate).

#### 3.8.4.1. Ute Ladies'-Tresses Orchid (ULT)

The FWS lists the Ute ladies'-tresses orchid (ULT) as threatened The PRB FEIS discussed the affected environment for ULT, p. 3-175, which BLM incorporates here by reference. The Wyoming Natural Diversity Database model predicts undocumented populations may be present in southern Campbell and northern Converse Counties. Scientists only documented 4 orchid populations in Wyoming prior to 2005. There is no adequate ULT habitat present in the project area. The closest known population of ULTs is the Antelope Creek population 46.7 miles to the southwest of the project area in Converse County.

#### 3.8.4.2. Candidate Species – Greater Sage-Grouse (GSG)

The FWS determined that the Greater Sage-Grouse (GSG) warrants federal listing as threatened across its range, but precluded listing due to other higher priority listing actions, 75 Fed. Reg. 13910 to 14014, Mar. 23, 2010; 75 Fed. Reg. 69222 to 69294, Nov. 10, 2010. GSG are a WY BLM SSS and 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. GSG are also a BCC for FWS's Region 17. The PRB FEIS addressed the affected environment for GSG, pp. 3-194 to 3-199.

In its *Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats* (2009), WGFD categorized impacts to GSG by number of well pad locations per square mile within 2 miles of a lek and within identified nesting/brood-rearing habitats greater than 2 miles from a lek. Moderate impacts occur when well density is between 1 and 2 well pad locations per square mile or where there is less than 20 acres of disturbance per square mile. High impacts occur when well density is between 2 and 3 well pad locations per square mile or when there are between 20 and 60 acres of disturbance per square mile. Extreme impacts occur when well density exceeds 3 well pad locations per square mile or when there are greater than 60 acres of disturbance per square mile.

The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) recommends that impacts to leks occur within 4 miles of oil and gas developments. WGFD records indicate that 9 GSG leks occur within 4 miles of the project area, see Table 3.2. Suitable GSG habitat (as defined in Soehn, et al., 2001), is present in the disturbance area. There is a good sagebrush stand with flat terrain present at the proposed well location. The area is surrounded by overhead powerlines and other wells, roads and disturbed vegetation. Active coal mines are within sight and are within 2 miles in 2 directions. No GSG sign was observed at the proposed well location.

**Table 3.2. Greater Sage-Grouse Leks within 4 Miles of the Project Area**

| Lek Name/Location | Distance to Project | Occupied? | Year: Peak Males | | In Core Area? |
|---|---|---|---|---|---|
| Kay<br>Sec 5, Twp. 46N, Rng. 70W | 0.6 mi south | Yes | 2012: --<br>2011: 0<br>2010: 0 | 2009: 0<br>2008: 0 | No |
| Flora<br>Sec 35, Twp. 47N, Rng 70W | 3.4 mi northeast | Yes | 2012: --<br>2011: --<br>2010: 1 | 2009: 0<br>2008: -- | No |
| Edwards<br>Sec 2, Twp. 46N, Rng 71W | 3.2 mi east | No | 2012: --<br>2011: --<br>2010: 0 | 2009: --<br>2008: 0 | No<br>(BLM Focus Area) |

| Lek Name/Location | Distance to Project | Occupied? | Year: Peak Males | | In Core Area? |
|---|---|---|---|---|---|
| Coal Creek IV<br>Sec 21, Twp. 46N, Rng 70W | 3.5 mi south | Yes | 2012: --<br>2011: 0<br>2010: 0 | 2009: 0<br>2008: 0 | No |
| Coal Creek III<br>Sec 21, Twp. 46N, Rng 70W | 3.5 mi south | Yes | 2012: --<br>2011: 1<br>2010: 0 | 2009: 0<br>2008: 0 | No |
| Coal Creek II<br>Sec 18, Twp. 46N, Rng 70W | 2.3 mi south | Yes | 2012: --<br>2011: 0<br>2010: 0 | 2009: 0<br>2008: 0 | No |
| Coal Creek I<br>Sec 17, Twp. 46N, Rng 70W | 2.3 mi south | No | 2012: --<br>2011: --<br>2010: 0 | 2009: 0<br>2008: 0 | No |
| Booze<br>Sec 19, Twp. 47N, Rng 70W | 2.7 mi north | No | 2012: --<br>2011: --<br>2010: -- | 2009: --<br>2008: -- | No |
| Belle Fourche S<br>Sec 2, Twp. 46N, Rng 71W | 3.4 mi east | No | 2012: --<br>2011: --<br>2010: -- | 2009: --<br>2008: -- | No<br>(BLM Focus Area) |

### 3.9. West Nile Virus

West Nile virus (WNv) is a mosquito-borne disease that can cause encephalitis or brain infection. Mosquitoes spread this virus after feeding on infected birds and then bite people, other birds, and animals. WNv is not spread by person-to-person contact, and there is no evidence that people can get the virus by handling infected animals. Since its discovery in 1999 in New York, WNv established and spread across the United States. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. *Culex tarsalis* appears to be the most common mosquito vector. Mosquitoes can hatch from standing water in as few as 4days. BLM summarized USGS data found at www.westnilemaps.usgs.gov in Table 3.3. Reported data from the PRB includes Campbell, Sheridan, and Johnson Counties.

**Table 3.3. Historical West Nile Virus Information**

| Year | Total WY Human Cases | Human Cases PRB | Equine Cases PRB | Bird Cases PRB |
|---|---|---|---|---|
| 2001 | 0 | 0 | 0 | 0 |
| 2002 | 2 | 0 | 15 | 3 |
| 2003 | 392 | 85 | 46 | 25 |
| 2004 | 10 | 3 | 3 | 5 |
| 2005 | 12 | 4 | 6 | 3 |
| 2006 | 65 | 0 | 2 | 2 |
| 2007 | 155 | 22 | Unknown | 1 |
| 2008 | 10 | 0 | 0 | 0 |
| 2009 | 10 | 1 | 1 | No record |
| 2010 | 6 | 0 | 0 | 0 |
| 2011 | 3 | 0 | Unknown | No record |

**Source:** Wyoming Department of Health, http://diseasemaps.usgs.gov/wnv_wy_human.html

Human cases of WNv in Wyoming occur primarily in the late summer or early fall. Scientists found WNv in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations incurred very high mortality, particularly corvids (crows, jays). Raptor species also appear to be highly susceptible to WNv. Wyoming scientists documented in 2003 that 36 raptors died from WNv in

Wyoming, including golden eagle, red - tailed hawk, ferruginous hawk, American kestrel, Cooper 's hawk, northern goshawk, great-horned owl, prairie falcon, and Swainson 's hawk (Cornish et al. 2003).

The Wyoming State Vet Lab determined 22 GSG in one study project (90% of the study birds), succumbed to WNv in the PRB in 2003. While birds infected with WNv have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003). Current science suggests a synergy between WNv and energy development amplifying the negative impact GSG (FWS 2010 p. 13947). There is usually increased surface water in the PRB associated with CBNG development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the PRB indicates WNv mosquito vectors were notably more abundant on a developed CBNG site than 2 similar undeveloped sites (Walker et al. 2003). The WDEQ and the Wyoming Department of Health sent a letter to CBNG operators on June 30, 2004. The letter encouraged people employed in occupations that require extended periods of outdoor labor, be provided educational material by their employers about WNv to reduce the risk of WNv transmission.

### 3.10. Cultural Resources

Class III cultural resource inventories were performed for the Federal 5-22 well prior to on-the-ground project work (BFO project no. 070120056 and 070130023). Class III cultural resource inventories following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the Wyoming State Historic Preservation Office Format, Guidelines, and Standards for Class II and III Reports were provided to the BFO. Douglas Tingwall, BLM Archaeologist, reviewed the reports for technical adequacy and compliance with BLM standards, and determined them to be adequate. The following cultural resources are in a 1 mile radius of the project area.

**Table 3.4. Cultural Resources Within a 1.0 Mile Radius of the Project Area**

| Site Number | Site Type | National Register Eligibility |
|---|---|---|
| 48CA109 | Prehistoric Lithic Scatter | Not Eligible |
| 48CA614 | Historic Wood Loading Ramp | Not Eligible |
| 48CA615 | Prehistoric Lithic Scatter | Not Eligible |
| 48CA2469 | Historic Cairn | Not Eligible |

There are no eligible sites within the APE of the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 10/22/12 and 12/20/12 that no historic properties exist within the Area of Potential Effects (APE).

## 4. ENVIRONMENTAL EFFECTS

This section describes the environmental effects of Alternatives A and B. This analysis addresses the direct and indirect effects of implementing the proposed well; the cumulative effects of the proposed well, combined with reasonably foreseeable federal and non-federal actions identifies and analyzes mitigation measures (COAs), and discloses any residual effects remaining, following mitigation.

**Alternative A: No Action Alternative**

BLM analyzed the No Action Alternative as Alternative 3 in the PRB FEIS. BLM incorporates it by reference here, along with aggregate analysis noting the state and private projects built, represented, and inferred in the table in Section 1.1, above. Information specific to resources for this alternative is in the PRB FEIS on pages found in Table 4.1. It is self-evident that the no action alternative will retain the

analysis area in a condition similarly situated to its status found in the PRB FEIS, with the minor changes from the small subsequent private developments noted in Section 1.1.

**Table 4.1. Location of Discussion of the No Action Alternative in the PRB FEIS**

| Resource | | Type of Effect | Page(s) of PRB FEIS |
|---|---|---|---|
| Project Area Description | Geologic Features and Mineral Resources | Direct and Indirect Effects | 4-164 and 4-134 |
| | | Cumulative Effects | 4-164 and 4-134 |
| Soils, Vegetation, and Ecological Sites | Soils | Direct and Indirect Effects | 4-150 |
| | | Cumulative Effects | 4-152 |
| | Vegetation | Direct and Indirect Effects | 4-163 |
| | | Cumulative Effects | 4-164 |
| | Wetlands/Riparian | Direct and Indirect Effects | 4-178 |
| | | Cumulative Effects | 4-178 |
| Wildlife | Sensitive Species - Greater Sage-Grouse | Direct and Indirect Effects | 4-271 |
| | | Cumulative Effects | 4-271 |
| | Aquatic Species | Direct and Indirect Effects | 4-246 |
| | | Cumulative Effects | 4-249 |
| | Migratory Birds | Direct and Indirect Effects | 4-234 |
| | | Cumulative Effects | 4-235 |
| | Waterfowl | Direct and Indirect Effects | 4-230 |
| | | Cumulative Effects | 4-230 |
| | Big Game | Direct and Indirect Effects | 4-186 |
| | | Cumulative Effects | 4-211 |
| | Raptors | Direct and Indirect Effects | 4-224 |
| | | Cumulative Effects | 4-225 |
| Water | Ground Water | Direct and Indirect Effects | 4-63 |
| | | Cumulative Effects | 4-69 |
| | Surface Water | Direct and Indirect Effects | 4-77 |
| | | Cumulative Effects | 4-69 |
| Economics and Fluid Mineral Recovery | | Direct and Indirect Effects | 4-362 |
| | | Cumulative Effects | 4-370 |
| Cultural Resources | | Direct and Indirect Effects | 4-286 |
| Air Quality | | Direct and Indirect Effects | 4-386 |
| | | Cumulative Effects | 4-386 |
| Visual Resources | | Direct and Indirect Effects | 4-313 |
| | | Cumulative Effects | 4-314 |

**Alternative B – The Proposed Action (Proposal)**

### 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 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 and Cumulative Air Quality Effects, 2009 concluded that PRB projected fluid and solid development would not violate state, tribal, or federal air quality standards and this project is within the projected development analysis parameters. Water or approved dust control methods will be used if or as needed.

## 4.2. Soils and Vegetation

### 4.2.1. Direct and Indirect Effects

Anticipated impacts occurring include soil rutting and mixing, compaction, increased erosion potential, and loss of soil productivity. The most notable impacts would occur in association with the construction of well pads, staging areas, and roads. Construction of these facilities requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. Construction activities mix the soil profiles with a corresponding loss of soil structure. Mixing may result in removal, dilution, or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Less desirable inorganic compounds such as carbonates, salts, or weathered materials could be relocated and have a negative impact on re-vegetation. Successful reclamation is expected at this location with the application of the operator and the BLM's mitigation and COAs, adequate moisture, sound grazing practices and time. Soils compaction results from the construction of wells and associated facilities, continued vehicle and foot traffic as well as operational activities. 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. Compaction leads to a loss of soil structure; decreased infiltration, permeability, and soil aeration; as well as increased runoff and erosion.

Increased erosion can lead to a decrease in soil fertility and an increase in sedimentation. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted. The potential for erosion would increase through the loss of vegetation cover and soil structure as compared to an undisturbed state. Soil productivity would decrease, primarily as a result of profile mixing and compaction along with the loss in vegetative cover. These impacts would begin immediately as the soils would be subjected to grading and construction activities and impacts would continue for the term of operations. The impacts on soils would move to a steady state as construction activities were completed and well production/maintenance operations begin.

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 (Belnap et al. 2001). They adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily damaged or destroyed by surface disturbances associated with construction activities.

Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting physically severs roots, thus reducing soil aeration and infiltration thereby degrading the rooting environment. Rutting may result in topsoil and subsoil mixing, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by diverting and concentrating water flow thus accelerating erosion. Soil mixing typically results in a decrease in soil fertility and a disruption of soil structure. Operator proposed engineered sections of road to gain access to the wells due to steep slopes, with cuts/fills exceeding 5 feet. The operator is responsible for having the licensed professional engineer(s) certify that the construction of those roads meet the design criteria and are built to Bureau standards. These engineered road segments should be completed, including any culverts, low water crossings and required surfacing, before the drilling rig or other drilling equipment moves onto the pad in order to protect erodible soils.

Low water crossings (LWC) are a BLM approved construction technique to allow all weather access though drainages where culverts are not appropriate or desired. BLM recommends specific design criteria for a typical LWC which must be shown in proposed road designs. Construction completed to BLM

approvable standards will reduce down drainage sedimentation, erosion, and scouring caused by frequent failure of in-channel structures.

Operator and BLM recommended a Loamy seed mix for this POD, based on soil map unit types, the dominant ecological sites found in the project area, and the mixing of soil horizons in disturbed areas. The BLM will evaluate reclamation success using the requirements in the BLM State Wide Reclamation Policy found at: http://www.blm.gov/wy/st/en/programs/reclamation, incorporated here by reference. Expanded gas, water, and electric ROW infrastructure linking POD support facilities are part of reasonably foreseeable development (RFD) additions to the proposed action (PRB ROD, p. 2). A foreseeable addition may be a request for a ROW to connect roads, gas and water utility lines.

### 4.2.2. Soils Susceptible to Erosion

All soils are susceptible to erosion when they are disturbed. Mitigation measure applied by the operator and the BLM, will reduce uncontrolled erosion and increase reclamation success. When needed, culverts will be at the appropriate locations for channels crossed by roads specified in the BLM Manual 9112, Bridges and Major Culverts and Manual 9113, Roads. Channels will be perpendicular to flow, where possible, and all design of channel crossing structures will carry the 25-year discharge event or other capacities as directed by the BLM.

#### 4.2.2.1. Cumulative Effects

For details on expected cumulative impacts, refer to the referenced PRB FEIS, Chapter 4. The PRB FEIS defines the designation of the duration of disturbance (pp. 4-1 and 4-151). Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization.

#### 4.2.2.2. Mitigation Measures

BLM will consider the following:

1. Implementation of the mitigation measures in the COAs, for this APD, and its associated plans including the Integrated Weed and Pest Management Plan, the WMP, and the MSUP (specifically Plans for Reclamation of the Surface) will reduce surface disturbance impacts to ecological sites and vegetation. Maintain at least a 20 feet, undisturbed vegetated buffer near the draw at the edge of the location.
2. Access road will have topsoil removed and the disturbed area will have a graveled, crowned surfaced (no flatblading of road) before construction and drilling of the well. If well is a producer, then upgrade road to “all weather” road design.

#### 4.2.2.3. Residual Effects

Residual effects across the POD would include a long-term loss of soil productivity associated with well pads and roads. The PRB FEIS identified residual effects (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established. In spite of the above residual effects, the BLM considers that Alternative B is within the parameters for surface disturbance and surface disturbance reclamation in PRB FEIS ROD**.**

### 4.2.3. Vegetation and Ecological Sites

#### 4.2.3.1. Direct and Indirect Effects

The PRB FEIS discusses most direct and indirect effects to ecological sites and vegetation (p. 4-153 to 4-164). The proposed action would impact the common plant communities that occur on the site and the transition between the communities. Other impacts anticipated to occur include those in the direct and indirect effects listed above under soils section. Direct effects to ecological sites would occur from ground disturbance caused by construction of well pads, 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 may not regenerate easily after human disturbance such as urban or agricultural development, or even after natural occurrences such as wildfire. It may take years, even generations, for sagebrush to fully grow back. Sagebrush still has not 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).

#### 4.2.3.2. Cumulative Effects

The PRB FEIS discusses the cumulative effects to ecological sites (pp. 4-153 to 4-172). Cumulative effects to ecological sites include the further alteration of disturbance regimes from the increased disturbance, increase in noxious weeds, and alterations in vegetation community's diversity and cover.

#### 4.2.3.3. Mitigation Measures

BLM will consider implementation of the mitigation measures in the COAs, for this APD, and its associated plans including the Integrated Weed and Pest Management Plan, the WMP, and the MSUP (specifically Plans for Reclamation of the Surface) will reduce surface disturbance impacts to ecological sites and vegetation. See the administrative record for some of these documents.

The operator will drill seed on the contour to a depth of less than 0.5 inch, followed by cultipaction to compact the seedbed, preventing soil and seed losses. To maintain quality and purity, the current years tested, certified seed with a minimum germination rate of 80% and a minimum purity of 90% will be used. On BLM surface or in lieu of a different specific mix desired by the surface owner, use the following:

**10-14" Precipitation Zone Loamy Ecological Site**
**Seed Mix**

| Species | % in Mix | Lbs PLS* |
|---|---|---|
| ***Western Wheatgrass*** (Pascopyrum smithii) or<br>***Thickspike Wheatgrass*** (Elymus lanceolatus ssp. lanceolatus) | 30 | 4.8 |
| ***Bluebunch Wheatgrass*** (Pseudoroegneria spicata ssp. Spicata) | 10 | 1.2 |
| ***Green needlegrass*** (Nassella viridula) | 25 | 3.0 |
| ***Slender Wheatgrass*** (Elymus trachycaulus ssp. trachycaulus) | 20 | 1.2 |
| ***Prairie coneflower*** (Ratibida columnifera) | 5 | 0.6 |
| ***White or purple prairie clover*** (Dalea candidum, purpureum) | 5 | 0.6 |
| ***American vetch***(Vicia americana) | 5 | 0.6 |
| **Totals** | **100%** | **12 lbs/acre** |

*PLS = pure live seed
*Northern Plains adapted species
*Double this rate if broadcast seeding

This is a recommended seed mix based on the native plant species listed in the NRCS Ecological Site descriptions, U.W. College of Ag., and seed market availability. A site-specific inventory will allow the resource specialist to suggest the most appropriate species, percent composition, and seeding rate for reclamation purposes.

#### 4.2.3.4. Residual Effects

Residual effects identified in the PRB FEIS, p. 4-408 such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established. The alteration of biodiversity of ecological sites could result from disturbance, alterations in vegetation in reclaimed areas, and the spread and establishment of weed species. BLM developed a site specific loamy seed mix for the

proposed disturbance area. BLM can only require their use on BLM surface. The seed mix selected on private land is selected by the surface owner and may be designed to be more beneficial to cattle grazing than to soil stabilization. The result may be long term wind and water erosion on the loamy soils with little or no re-vegetation success. The BLM considers these residual effects from Alternative B for this proposed well are likely within the parameters for acceptable surface disturbance and surface disturbance reclamation in PRB FEIS ROD and Onshore Order Number 1.

### 4.3. Water Resources

Adherence to the drilling COAs, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and using proper cementing procedures should protect fresh water aquifers above the drilling target zone. Compliance with the drilling and completion plans and Onshore Oil and Gas Orders Nos. 2 and 7 will ensure there is no adverse impact on ground water. The volume of water produced by this federal mineral development is unknowable at the time of permitting.

Wesco will have to produce the well for a time to be able to estimate the volume and quantity of water production. To comply with Onshore Order Oil and Gas Order No. 7 Disposal of Produced Water, Wesco will submit a Sundry to the BLM within 90 days of first production which includes a representative water analysis and the final proposal for water management.

As part of the completion process for this well, Wesco may choose to acid stimulate or hydraulically fracture the formation to promote oil production. Water from identified sources will be used for the stimulation. The procedures will be isolated from shallow zones to focus the process energy in the productive formation. Flow back or return water will be transported off site and disposed at a WOGCC permitted disposal facility. The WOGCC monitor and regulate the chemicals for drilling and completion as well as Class II underground injection disposal. “BLM may rely on the actions of state regulators. The IBLA and federal courts recognized it is appropriate for BLM to assume a proposed action complies with state permitting requirements, and rely on state analysis when evaluating the significance of effects. Wyo. Outdoor Council v. U.S. Army Corps of Eng'rs, 351 F. Supp. 2d 1232, 1244 (D. Wyo. 2005); PRBRC, 180 IBLA 32, 57 (2010); Bristlecone Alliance, 179 IBLA 51, 74-77 (2010).” In Wyoming Outdoor Council, the District Court held the Corps may rely on the WDEQ permitting process to “ameliorate any concerns that impacts to water quality will be significant.” Id.

During construction and subsequent production of this well, Wesco committed to stabilize the constructed area to reduce the risk of sediment transport due to erosion. This and compliance with WDEQ Storm Water Pollution Prevention criteria will minimize the impacts to surface water resources in the area.

#### 4.3.1. Groundwater

##### 4.3.3.1. Direct and Indirect Effects

The operator intends to use approximately 8,500 barrels of groundwater from the existing 1-N-19 well for drilling and completing the 5-22 well. A water quality analysis dated November 19, 1993 along with the WSEO water withdrawal permit for the 1-N-19 well was submitted with the APD for the 5-22 well. The water will be stored on the drill pad location in a steel tank for use as needed. The WOGCC and the WDEQ regulate the use and environmental impacts of the use of this water. The operator committed in the MSUP to abide to the state and federal regulations for the drilling and production of the well. Therefore, no direct or indirect adverse effects are anticipated.

##### 4.3.3.2. Cumulative Effects

There will be a withdrawal of approximately 8,500 barrels of groundwater from the 1-N-19 well which is drilled to a depth of 8,707 feet and produces from depths of 3,565 to 3,970 feet below ground surface. The well permit dated October 1993, states that the rate of withdrawal is 60 gpm (2,057 barrels/day). It is

unknown how the groundwater levels have responded in the area to the well production since the well was installed. The well is permitted by the WSEO.

The Amkirk 3-I-6 injection well will inject water at a maximum of 1900 psi into the Minnelusa Sand Formation at depths of 10,230 to 10,258 (BLM/WOGCC Sundry approved June 9, 2011, WOGCC approved August 9, 2011). As this well has been operating at 1000 psi at 800 BWPD as of February 2011, it is anticipated the increased injection pressure will also increase the volume of water injected at these depths. The effect of the increased injection water volume is unknown. The well is permitted by the WOGCC and will continue to operate under the conditions imposed by their permit.

#### 4.3.3.3. Mitigation Measures

Adherence to the drilling COAs, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and using proper cementing procedures should protect any fresh water aquifers above the target coal zone. This will ensure that ground water will not be adversely impacted by well drilling and completion operations.

## 4.4. Wetland Riparian

Watershed values, including natural drainages, would not be adversely impacted by the proposal with properly applied mitigation. The cumulative impacts of the proposed action, when considered with other existing and proposed development in the project area are not expected to be significant. The application of mitigation measures will ensure that the incremental impacts of this well, when considered with any existing development are insignificant.

## 4.5. Invasive Species

### 4.5.1. Direct and Indirect Effects

The operator has committed to the control of noxious weeds and species of concern using the following measures identified in their Integrated Pest Management Plan (IPMP): The operator and BLM found no noxious weeds or species of concern at the affected location. If weeds are found the operator will:

1. The operator will conduct annual inspections for weeds.
2. If weeds are found, the operator will develop an “invasive plant management plan”.
3. This weed management plan will follow the manufacturers’ instructions and use herbicides approved by the BLM.

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 in NE Wyoming that a control program is not presently feasible. 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.

### 4.5.2. Cumulative Effects

Activities related to the development of the proposed project would create a favorable environment to the establishment and spread of noxious weeds/invasive plants if adequate control measures are not used.

### 4.5.3. Mitigation Measures

The operator committed to the control of noxious weeds and species of concern using the following measure identified in their Integrated Pest Management Plan (IPMP): Controls would be applied as recommended by chemical manufacturers and/or land management agencies. Control would usually take place in the spring and fall of the year.

#### 4.5.4. Residual Effects

Control efforts by the operator are limited to the disturbance associated with the project. Cheatgrass and/or downy brome (bromus tectorum) and to a lesser extent, Japanese brome (bromus japonicas) exist in the affected environment. These species are found in such high densities and numerous locations throughout NE Wyoming that a control program is not considered feasible at this time. These annual weeds would continue to exist in the project area.

### 4.6. Fish and Wildlife Impacted Beyond Those Described in the PRB FEIS

#### 4.6.1. Big Game

The proposal's direct, indirect, and cumulative effects to big game are those found in the PRB FEIS, pp. 4-181 to 4-211. The current populations for pronghorn, white-tailed deer, mule deer, and elk are above, above, below, and above WGFD goals, respectively. BLM recommends no mitigation measures and foresees no residual effects beyond those identified in the PRB FEIS.

#### 4.6.2. Non-Game

##### 4.6.2.1. Raptors

###### 4.6.2.1.1. Direct and Indirect Effects

The PRB FEIS analyzed direct and indirect effects to raptors, pp. 4-216 to 4-221. This project will result in disturbance in proximity of nesting raptors, including direct loss of foraging habitats and indirect losses associated with declines in habitat effectiveness. All raptors using nests in the vicinity of the project will likely be impacted to some extent by the human disturbance associated with operation and maintenance. 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 disruptive activities occur during nesting, they could be sufficient to cause adult birds to remain away from eggs or chicks causing overheating or chilling. This can result in egg or chick death. 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 and resulting in increased nest predation.

###### 4.6.2.1.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS, p. 4-221.

###### 4.6.2.1.3. Mitigation Measures

The BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests to reduce the risk of decreased productivity or nest failure. The one ferruginous hawk nest within 0.5 miles has not been active since 2006. Because of other existing wells in close proximity to the nest, it is unlikely that ferruginous hawk pairs sensitive to human disturbance will use the site. Timing limitations for raptors are not recommended for this project.

###### 4.6.2.1.4. Residual Impacts

There are no impacts anticipated.

##### 4.6.2.2. Migratory Birds

###### 4.6.2.2.1. Direct and Indirect Effects

The PRB FEIS discussed the direct and indirect effect 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. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. 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.

##### 4.6.2.2.2. Cumulative Effects

The cumulative effects associated with alternative B are within the analysis parameters and impacts described in the PRB FEIS, p. 4-235.

##### 4.6.2.2.3. Mitigation Measures

BLM proposes no timing limitations on surface disturbing activities specifically for migratory birds. However, Greater Sage-Grouse (GSG)e timing limitations on surface disturbing activities will also serve to mitigate impacts to nesting migratory birds.

##### 4.6.2.2.4. Residual Effects

Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where BLM applies GSG or raptors nesting timing limitations, nesting migratory birds receive protection. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable.

## 4.7. Threatened, Endangered, Candidate, Special Status (Sensitive) Species

### 4.7.1. Threatened and Endangered Species

#### 4.7.1.1. Ute Ladies'-Tresses Orchid (ULT)

Based on the USFWS current species list for Campbell County (updated May 2012), the Ute Ladies'-tresses Orchid is the only listed species requiring an effects determination (ESA Section 7 (2)). Suitable habitat is not present in the project area and implementation of the proposed project will have "***no effect***" (direct, indirect, or cumulative) on ULT. The PRB FEIS discussed the cumulative effects to ULT, pp. 4-253 to 4-254). BLM proposes no mitigation with Alternative B and anticipates no residual effects.

### 4.7.2. Candidate Species

#### 4.7.2.1. Greater Sage-Grouse (GSG)

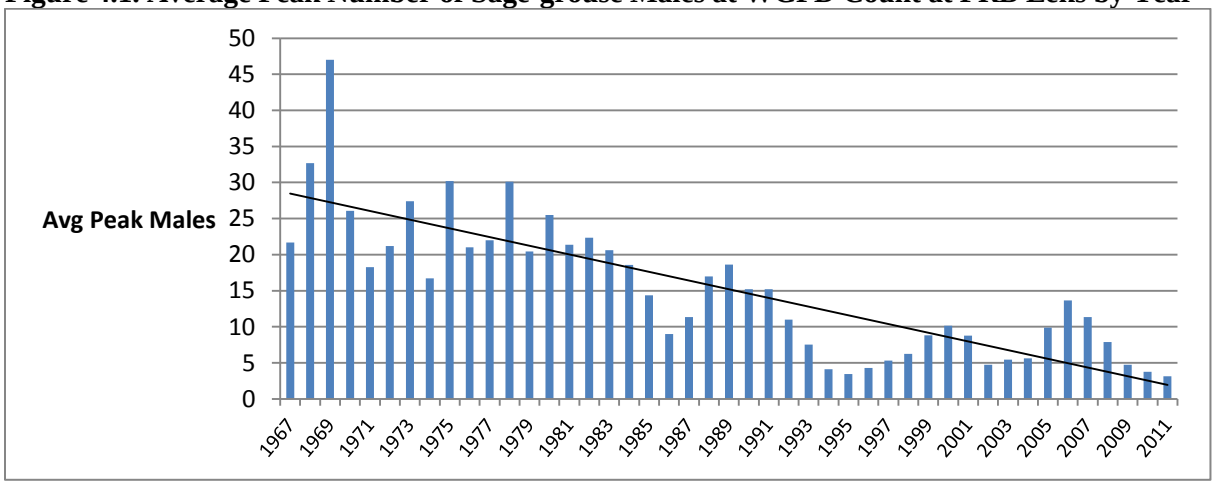
##### 4.7.2.1.1. Direct and Indirect Effects

Implementation of the proposal will impact GSG habitat and individuals. Impacts to GSG are a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. The *12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered* (FWS 2010) and chapters 15-21 of Greater Sage-Grouse Ecology and Conservation of a Landscape Species and its Habitats (Knick and Connelly 2011) – both discuss impacts to GSG associated with energy development in detail. Implementation of the project will adversely impact nesting habitat, both through direct loss and avoidance of the area by GSG. To protect nesting and brood rearing GSG, BLM will implement a timing limitation (1 March to 15 June) on all surface-disturbing activities associated with the proposed project. The PRB FEIS discussed direct and indirect impacts to GSG in more detail, pp. 4-257 to 4-273. Implementation of the proposed Westco Fed. 5-22 well will cause sagebrush habitat removal and functional loss of habitat from fragmentation and anthropogenic activity.

##### 4.7.2.1.2. Cumulative Effects

The GSG population in northeast Wyoming exhibited a steady long term downward trend, as measured by lek attendance (WGFD 2011). Figure1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. The research described below suggests that these declines may be a result, in part, of CBNG development in this region of Wyoming and that the leks in the cumulative impact assessment area are experiencing similar declines.

**Figure 4.1. Average Peak Number of Sage-grouse Males at WGFD Count at PRB Leks by Year**




Research shows that declines in lek attendance correlate with oil and gas development. Projections show in a typical PRB landscape that energy development within 2 miles of leks reduces the average probability of lek persistence from 87% to 5% percent (Walker et al. 2007). Several studies showed that well density is a useful metric for evaluating impacts to GSG, as measured by declines in lek attendance (Braun et al. 2002, Holloran et al. 2005, and Walker et al. 2007). These studies indicated that oil or gas development exceeding approximately 1 well pad per square mile, resulted in calculable impacts on breeding populations, as measured by the number of male GSG attending leks (State Wildlife Agencies' Ad Hoc Committee for Sage-Grouse and Oil and Gas Development 2008).

Recent research suggests that the cumulative and synergistic effects of current and foreseeable CBNG development within the vicinity of the project area are likely to impact the local GSG population, cause declines in lek attendance, and may result in local extirpation. The cumulative impact assessment area for this project encompasses the project area and the area that is encompassed by a 4 mile radius around the 9 GSG leks that occur within 4 miles of the project boundary. Analysis of impacts up to 4 miles was recommended by the State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008).

There are currently 217 wells (Wyoming Oil and Gas Conservation Commission [WOGCC] November 13, 2012) in the cumulative impact assessment area of 133 square miles, which amounts to a density of 1.6 wells per square mile. Currently, there are approximately 60 proposed wells (Automated Fluid Minerals Support System [AFMSS] 11/13/12) (including the 1 from this project) within 4 miles of the 9 leks. With the addition of the proposed wells, the well density within 4 miles of the leks increases to 2.1 wells per square mile, which is almost twice the one well per square mile recommendation by the State Wildlife Agencies' Ad Hoc Committee for Sage-Grouse and Oil and Gas Development.

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 [PRB] or the entire range of the species is not likely to be compromised (p. 4-270)." Based on the impacts described in the PRB FEIS and the findings of more recent research, the proposed action may contribute to a decline in male attendance at the 9 leks that occur within 4 miles of the project area, and, potentially, extirpation of the local GSG population.

The 2012 BLM-contracted population viability analysis for the Northeast Wyoming GSG found that there remains a viable population of GSG in the PRB (Taylor et al. 2012). Threats from energy development and West Nile Virus (WNv) are impacting future viability (Taylor et al. 2012). The study indicated that effects from energy development, as measured by male lek attendance, are discernible out to a distance of 12.4 miles. Studies document the additive impacts of energy development and WNv as a threat to GSG persistence in the PRB (Taylor et al. 2012, Garton et al. 2011). The cumulative and synergistic effects of oil and gas development and WNv in the PRB area will continue to impact the local GSG population, causing further declines in lek attendance, and could result in local extirpation: "[f]indings reflect the status of a small remaining [GSG] population that has already experienced an 82% decline within the expansive energy fields (Walker et al. 2007a), a level of impact that has severely reduced options for delineating core areas that are large enough and in high enough quality habitats to sustain populations." (Taylor et al. 2012).

Current well densities reduced the function of PRB core areas, affecting all of the remaining active leks within core (Taylor et al. 2012). Continued energy development around the core areas will continue to impact their remaining value. Declines in active leks and male attendance indicate that the WNv outbreaks and energy development reduce GSG populations and that they interact to exacerbate population declines. The effects of one WNv outbreak year could cut a population in half. Absent a WNV outbreak, or any stochastic event of similar magnitude, immediate extirpation is unlikely. Results suggest that if current oil and gas development rates continue, they may compromise future viability of NE Wyoming GSG, with an increased chance of extirpation with additional WNv outbreaks (Taylor et al. 2012). The Wyoming BLM adopted the State of Wyoming's Core Area Strategy through issuance of Instruction Memorandum, WY-2012-019. The proposed well is not in a core or connectivity area.

##### 4.7.2.1.3. Mitigation Effects

In order to reduce the likelihood that activities associated with noise, construction, and human disturbance, BLM will implement a timing limitation on all surface-disturbing activities in GSG habitat. The intent of this timing restriction is to decrease the likelihood that GSG will avoid these areas and increase habitat quality by reducing noise and human activities during the breeding season.

##### 4.7.2.1.4. 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 GSG will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with fluid mineral development.

#### 4.7.3. Special Status (Sensitive) Species (SSS)

BLM supports the 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 PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-265. BLM analyzed site specific effects to sensitive species in Appendix A-1.

### 4.8. West Nile Virus

#### 4.8.1. Direct and Indirect Effects

This project is likely to result in standing surface water which may increase mosquito breeding habitat.

#### 4.8.2. Cumulative Effects

There are many sources of native standing water throughout the PRB that add mosquito habitat. Summer thunderstorms, that pool water for more than 4 days in hot weather, can result in large Culex mosquito hatches. Other sources of water include; natural flows, livestock watering facilities, coal mining operations, and human outdoor water use and features in and around communities.

#### 4.8.3. Mitigation Measures

There is little evidence that treatment, either through the use of larvicides or malithion, on a site specific or basin-wide scale will have any effect on the overall spread of the disease; however, one study showed that landscape level larvacide applications can decrease the number of hatching mosquitoes in an area (BHEC).

#### 4.8.4. Residual Effects

BLM foresees no residual effects.

### 4.9. Cultural Resources

#### 4.9.1. Direct and Indirect Effects

There are no eligible sites in the area of potential effect (APE) of the proposal. Following the Wyoming State Protocol Section VI(A)(1) the BLM electronically notified the Wyoming State Historic Preservation Officer (SHPO) on October 22, 2012 and December 20, 2012 that no historic properties exist in the APE. If Operators observe any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

#### 4.9.2. 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 oil and 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.

#### 4.9.3. Mitigation Measures

If Operators observe any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and

ROD)] during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

#### 4.9.4. 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:

**BLM consulted or coordinated with the following on this project:**

| Contact | Organization | Onsite Presence? |
|---|---|---|
| Tom Kirkwood | Company Representative | Yes |
| Dave Weinert | Company Representative | Yes |
| Steve Olenick | Company Representative | Yes |
| Kevin Anderson | KLJ Surveying | Yes |
| Darrly Lefevre | Darita Enterprise | Yes |
| Dan Sellers | BLM | Yes |
| Don Brewer | BLM | Yes |
| Bud Stewart | WY Game and Fish Dept. | Yes |
| Pauline Schuette | FWS | Yes |
| Mary Hopkins | WYSHPO | No |

**List of Preparers (BFO unless otherwise noted)**

| Position/Organization | Name | Position/Organization | Name |
|---|---|---|---|
| NRS/Team Lead | Dan Sellers | Archaeologist | Doug Tingwall |
| Supr NRS | Casey Freise | Wildlife Biologist | Don Brewer |
| Petroleum Engineer | Will Robbie | Geologist | Warren Garrett |
| LIE | Christine Tellock | Grazing Management | Dan Sellers |
| Soils | Dan Sellers, Arnie Irwin | Supr NRS | Bill Ostheimer |
| Hydrologist | Keith A. Anderson | Assistant Field Manager | Chris Durham |
| Assistant Field Manager | Clark Bennett | NEPA Coordinator | John Kelley |

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**Appendix A. Table 1 Summary of Sensitive Species Habitat and Project Effects Associated with Alternative B.**

| Common Name (scientific name) | Habitat | Presence | Project Effects | Rationale |
|---|---|---|---|---|
| ***Amphibians*** | | | | |
| Northern leopard frog (*Rana pipiens*) | Beaver ponds and cattail marshes from plains to montane zones. | NS | NI | Habitat is not present. |
| Columbia spotted frog (*R*anus pretiosa) | 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 . |
| ***Fish*** | | | | |
| Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*) | 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. |
| ***Birds*** | | | | |
| Baird's sparrow (*Ammodramus bairdii*) | Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground. | NS | NI | Species not reported in Powder River Basin. |
| Bald eagle (*Haliaeetus leucocephalus*) | Mature forest cover often within one mile of large water body with reliable prey source nearby. | S | NI | Bald eagles may forage in the area but there are no trees for roosting or nesting. |
| Brewer's sparrow (*Spizella breweri*) | Sagebrush shrubland | S | MIIH | Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. |
| Ferruginous hawk (*Buteo regalis*) | Basin-prairie shrub, grasslands, rock outcrops | K | MIIH | One documented nest occurs within 0.5 miles of the project area. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area. |
| Loggerhead shrike (*Lanius ludovicianus*) | 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. |

| Common Name (scientific name) | Habitat | Presence | Project Effects | Rationale |
|---|---|---|---|---|
| Long-billed curlew (*Numenius americanus*) | Grasslands, plains, foothills, wet meadows | NS | NI | Habitat not present. |
| Mountain Plover | Short-grass prairie with slopes < 5% | NS | NI | Vegetation at location is too high to be suitable as mountain plover nesting habitat. |
| Northern goshawk (*Accipiter gentilis*) | Conifer and deciduous forests | NP | NI | Habitat not present. |
| Peregrine falcon (*Falco peregrinus*) | Cliffs | NP | NI | Habitat not present. |
| Sage sparrow (*Amphispiza billneata*) | Basin-prairie shrub, mountain-foothill shrub | NS | NI | Species not observed in Powder River Basin. |
| Sage thrasher (*Oreoscoptes montanus*) | 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 (*Cygnus buccinator*) | Lakes, ponds, rivers | NP | NI | Habitat not present. |
| Western Burrowing owl (*Athene cunicularia*) | Grasslands, basin-prairie shrub | NS | NI | No prairie dog colonies or other ground burrows present at proposed well location. |
| White-faced ibis (*Plegadis chihi*) | Marshes, wet meadows | NP | NI | Habitat not present. |
| Yellow-billed cuckoo (*Coccyzus americanus*) | Open woodlands, streamside willow and alder groves | NP | NI | Habitat not present. |
| ***Mammals*** | | | | |
| Black-tailed prairie dog (*Cynomys ludovicianus*) | Prairie habitats with deep, firm soils and slopes less than 10 degrees. | NP | NI | No prairie dog colonies or other ground burrows present at proposed well location. |
| Fringed myotis (*Myotis thysanodes*) | Conifer forests, woodland chaparral, caves and mines | NP | NI | Habitat not present. |
| Long-eared myotis (*Myotis evotis*) | Conifer and deciduous forest, caves and mines | NP | NI | Habitat not present. |

| Common Name (scientific name) | Habitat | Presence | Project Effects | Rationale |
|---|---|---|---|---|
| Swift fox (*Vulpes velox*) | Grasslands | S | MIIH | Suitable habitat is present. Disturbance from the well project may cause swift fox to avoid the area. |
| Townsend's big-eared bat (*Corynorhinus townsendii*) | Caves and mines. | NP | NI | Habitat not present. |
| ***Plants*** | | | | |
| Limber Pine (*Pinus flexilis*) | Mountains, associated with high elevation conifer species | NP | NI | Habitat not present. |
| Porter's sagebrush (*Artemisia porteri*) | Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft. | NP | NI | Habitat not present. |
| William's wafer parsnip (*Cymopterus williamsii*) | 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.
**MIIH -** 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