

**DECISION RECORD**  
**Black Hills Exploration & Production, Inc., Ethyl Draw Unit 44-17**  
**Environmental Assessment (EA), WY-070-EA14-185**  
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**DECISION.** The BLM approves Black Hills Exploration & Production, Inc. (BHE) Ethyl Draw Unit 44-17 gas and oil well application for permit to drill (APD) described in Alternative B of the environmental assessment (EA) WY-070-EA14-185, all incorporated here by reference. This approval includes the wells' support facilities.

**Compliance.** This decision complies with or supports:

- 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); including the Onshore Oil and Gas Orders.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Buffalo and Powder River Basin Final Environmental Impact Statements (FEISs), 1985, 2003, 2011.
- Buffalo Resource Management Plan (RMP) 1985 and Amendments.

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

**Well Site.** BLM approves 1 APD and support facilities:

	Well Name & #	Twp	Rng	Sec	Qtr	Lease #
1	Ethyl Draw Unit 44-17	46N	79W	17	SESE	WYW152044

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

**THE FINDING OF NO SIGNIFICANT IMPACT (FONSI).** Analysis of Alternative B of the EA, WY-070-EA14-185, and the FONSI (incorporated here by reference) found BHE's proposal for Ethyl Draw Unit 44-17 will have no significant impacts on the human environment, beyond those described in the PRB FEIS. There is no requirement for an EIS.

**COMMENT OR NEW INFORMATION SUMMARY.** BLM publically posted the APDs for 30 days, received no comments, and then internally scoped them. BLM received no new or clarified policies after receipt of the APD.

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

1. BLM and BHE included mitigation measures to reduce environmental impacts while meeting the BLM's need.
2. The well is in priority greater sage-grouse (GSG) habitat; however, both the disturbance density (0.02/640) and surface disturbance (2.46%) levels were found to be in compliance with EO 2011-5, as determined by WGFD (letter dated May 1, 2013).
3. BHE's operator committed measures that reduce impacts to GSG are:
  - a. BHE will conduct all surface disturbing and disruptive activities outside the GSG breeding nesting season (March 15 – June 30) and will keep the removal of sagebrush to a minimum. (SUPO, item 12.)
  - b. The reclamation seed mix contains 2 native grasses (at least 1 bunchgrass) and 2 native forb species, which is consistent with the general stipulations of EO 2011-5. (SUPO, p. 5)

- c. Travel on the project access roads will be restricted to the hours of 8am - 6pm during the GSG breeding season (March 1 - May 15) in order to reduce noise from vehicle traffic. (SUPO, item 12.)
4. BHE will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, and conform to currently available technology and practice.
5. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.
6. 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.
7. The operator certified it has a surface access agreement.
8. The project is clearly lacking in wilderness characteristics as it lacks federally owned surface.
9. This APD is pursuant to the Mineral Leasing Act for developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because no timely environmental analysis was performed for the project area.

**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:                   /s/ Duane W. Spencer                  

Date:                   7/15/14

**FINDING OF NO SIGNIFICANT IMPACT**  
**Black Hills Exploration & Production, Inc., Ethyl Draw Unit 44-17**  
**Environmental Assessment (EA), WY-070- EA14-185**  
**Bureau of Land Management, Buffalo Field Office, Wyoming**

**FINDING OF NO SIGNIFICANT IMPACT (FONSI).** Based on the information in the EA, WY-070-EA14-185, which BLM incorporates here by 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, 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 have minor controversy, are not highly uncertain, or do not involve unique or proven 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:                     /s/ Duane W. Spencer                    

Date:                     7/15/14

**ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA14-185**  
**Black Hills Exploration & Production, Inc., Ethyl Draw Unit 44-17**  
**Bureau of Land Management, Buffalo Field Office, Wyoming**

## **1. INTRODUCTION**

BLM provides an EA for Black Hills Exploration & Production, Inc. (BHE) Ethyl Draw Unit 44-17 oil and gas well application for permit to drill (APD). BLM's jurisdiction for this proposal is fee (non-federal) surface-overlying federal minerals "split-estate". This site-specific analysis tiers into and incorporates by reference the information and analysis in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS), WY-070-02-065, 2003, and the PRB FEIS Record of Decision (ROD) per 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on our website: [http://www.blm.gov/wy/st/en/field\\_offices/Buffalo.html](http://www.blm.gov/wy/st/en/field_offices/Buffalo.html). 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 no timely environmental analysis was performed for the project area.

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 APD: the site-specific analysis, and mitigation. Fourth is the monitoring and reclamation of wells and their features. (Pendery 2010)

### **1.1. Background**

The operator submitted an APD on October 23, 2013. BLM conducted the onsite with the operator and surface owner (Fred Carr) on December 18, 2013. BLM sent the post onsite deficiency letter on January 14 and the operator sent in the corrected deficiencies on March 17, 2014.

### **1.2. Need for the Proposed Project**

BLM's 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 with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. BLM incorporates by reference here, the APD information (40 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 posted the proposed APD for 30 days and will timely publish the EA, any finding, and decision on the BFO website. 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 that BLM externally scoped. External scoping of the horizontal drilling in Crazy Cat East EA, WY-070-EA13-028, 2013, in the PRB area received 3 comments, revealing no new issues. The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposal, its location, and a resource (issue) list (see administrative record), to identify potentially significantly affected resources, land uses, resource issues,

regulations, and site-specific circumstances not addressed in the tiered analysis or other analyses incorporated by reference. This EA will not discuss resources and land uses that are not present, unlikely to receive significant or material affects, or that the PRB FEIS or other analyses adequately addressed. This EA addresses the project’s potentially significant 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 project area is clearly lacking wilderness characteristics as it has no federally owned surface. Project issues include:

- Air quality
- Soils and vegetation: site stability, reclamation potential, invasive species.
- Water: ground water, quality and quantity of produced water.
- Wildlife: greater sage-grouse priority habitat, raptor productivity, migratory birds, special status species.

BLM analyzed the following issues in the PRB FEIS and they do not present a substantial environmental question of material significance to this proposal. These issues are not present, or minimally so. BLM analyzed them in the PRB FEIS and not in this EA:

Geological resources	Recreation	Wilderness characteristics
Cave and karst resources	Heritage & Visual Resources	Livestock & grazing
Wilderness characteristics	Paleontological resources	Wetlands/Riparian Areas
Forest Products	Transportation & Access	Socio-economic resources
Lands & Realty	Tribal Treaty Rights	Environmental justice
Fire, fuels management, and rehabilitation		Areas of critical environmental concern

## 2. PROPOSED PROJECT AND ALTERNATIVES

### 2.1. Alternative A – No Action

The no action 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. The PRB FEIS considered a no action alternative, pp. 2-54 to 2-62. The BLM keeps the no action alternative current using the aggregated effects analysis approach – tiering to or incorporating by reference the analyses and developments approved by the subsequent NEPA analyses for adjacent and intermingled developments to the proposal area.

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

**Overview.** BHE’s proposal is in Johnson County, WY, 17 miles north northwest of Sussex. The proposed well is 12 miles west of the Powder River. See the administrative record (AR) for the targeted formation.

**Table 2.1. Well Name/#/Lease/Location:**

Well Name & #	Twn	Rng	Sec	Qtr	Lease #
Ethyl Draw Unit 44-17	46	79W	17	SESE	WYW152044

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

#### Access Roads and Utilities

- Primary access for the proposed well is provided by Nine Mile Road.
- A road network will consist of existing primitive road upgraded to an improved road.
- No utilities are proposed with this project.

#### Well Locations

- The well’s pad cuts and fills will be constructed with 1½:1 slopes initially and reduced as much as possible during interim reclamation.

- There will be a reserve pit at the oil well location during drilling and completion operations.
- The pits will be lined with an impervious synthetic liner.
- If the well is a producer, production facilities, i.e. production tanks, water tanks, and a heater treater, will be placed on the well pads. A sundry with production facilities be approved by the BLM prior construction.
- No other off-site ancillary facilities are planned for this project. No staging areas, man camps/housing facilities are anticipated to be used off-site. Working trailers and sleeping trailers will be placed on the well pad during the drilling and completion of the well.

### Drilling and Completion Operations

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

- Hydraulic fracturing (HF) operations are planned as a ‘plug and perf’ operation done in stages. The process is anticipated to require 14 days. Water used for HF will come from the Eklund 23-1 water supply well located in the NWNE Section 23 T46N R80W. All fresh water will be held in 400-500 bbl rental HF tanks and no surface pits will be used to hold this water. No additional well pad disturbance is anticipated for HF operations. Completion flowback water will be held in tanks on location and trucked offsite to a disposal facility permitted by the Wyoming Department of Environmental Quality (WDEQ).
- It is anticipated that 40,000 bbls of water will be needed for drilling and completion operations. The fresh water for drilling operations will be trucked from multiple permitted sources; water sources listed in the respective SUPs.
- For completion (HF) phase, the operator intends use above ground tanks for onsite water storage at the pad. The above-ground tanks do not require a separate location or additional disturbance.
- Typically 170 500-bbl fracturing tanks are spotted, taking 2 weeks to fill, prior to pumping the stimulation. All fracturing water, including excess, is present before starting.
- Produced water during the production phase will be stored in a permanent storage tank. A third party will haul the flowback water, produced water, and oil from the reserve pit (if any) to permitted disposal facilities; outlined in the SUP.
- Truck traffic to fill HF tanks during completion operations is estimated to be approximately 700 roundtrips per well.

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.

**Table 2.2. Anticipated Drilling and Completion Sequence and Timing (per well)**

Drilling and Completion Step	Approximate Duration
Build location (roads, pad, and other initial infrastructure)	30 days
Mob rig	2-4 days <sup>1</sup>
Drilling (24/7)	30 days <sup>2</sup>
Schedule/logistics for completion	30 days
Completion (setup, completion, demobilization)	5-8 days

<sup>1</sup> Depending on distance and need to add supplemental drilling equipment, such as skidding plates.  
<sup>2</sup> By comparison, approximately 2 days are required to drill a CBNG well. Source: ICF 2012

Additionally, the operator, in their APD, 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 measures to alleviate resource impacts in their submitted surface use and drilling plans.
- Certify it has a surface access agreement with the landowners.

**Table 2.3. Disturbance Summary for Ethyl Draw Unit 44-17:**

Facility	Number or Miles	Factor	Construction Disturbance	Interim Disturbance
Engineered Pad	1 (520 ft x 480 ft)	249,600 sq ft	5.7 acres	1.8 acres
Improved Roads	1.8	60 ft	13 acres	(24 ft) 5.2 acres
<b>Total Surface Disturbance</b>			<b>18.7 acres</b>	<b>7 acres</b>

### 2.3. Conformance to 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, supporting FEISs, 1985, 2003 (2011), and laws including the Clean Air Act, 42 USC 7401-7671q (2006), the Clean Water Act, 33 USC 1251 et seq. (1972), etc.

### 3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment that may be significantly affected by the alternatives in Section 2, or where changes in circumstances or regulations occurred since adoption of analyses to which the EA tiers or incorporates by reference. The PRB FEIS considered a no action alternative (pp. 2-54 to 2-62) in evaluating a development of up to 54,200 fluid mineral wells. Nearly 60% of the deep oil and gas wells are hydraulically fractured; BLM and Goolsby 2012. The BLM uses the aggregated effects analysis approach incorporating by reference the circumstances and developments approved via the subsequent NEPA analyses for adjacent and intermingled developments coincident to proposal area to retain currency in the no action alternative. 615 F. 3d 1122 (9th Cir. 2010). The total number of conventional wells in the Buffalo planning area is 1313, which includes 783 horizontal wells (federal, fee, and state) (as of April 2013). This represents 41% of the projected 3,200 in the 2003 PRB ROD. This agrees with the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of 51,000 CBNG and 3,200 natural gas and oil wells. In addition, and other operators are likely to continue seeking permits to develop unconnected leases in or in the affects analysis areas near the project area; decisions to approve or deny future proposals will occur following APD submittal. Development occurring on non-federal surface and non-federal mineral estate would continue.

**Table 3.1. Analyses BLM Incorporates by Reference for Similar Habitats**

POD / Well Name	NEPA Analyses #	#/Type Well	Decision Date
APC Crazy Cat East*	WY-070-EA13-028	36/Oil	3/2013
WPX Kingsbury Unit 5 & West Kingsbury 1	WY-070-EA09-096	44/CBNG 45/CBNG	1/2011, 9/2009
LOG Whiskey Drawn	WY-070-EA09-048	11/CBNG	10/2010, 8/2009
Kennedy Iberlin	WY-070-EA06-060	36/CBNG	3/2006
	WY-070-CX08-014, -016		12/2007, 1/2008
LOG Whiskey Draw Add 1	WY-070-EA05-261	61/CBNG	3/2006, 9/2005

See also: SDR WY-2013-005, particularly noting pp. 2-3, incorporating the entirety here by reference.

\*BLM incorporates by reference the descriptions of drilling, hydraulic fracturing, water, and transportation.

BLM also incorporates by reference the 4 BHE fee APDs in Section 17, T46N, R80W found in the WOGCC website since they are foreseeable development with analysis areas and effects overlapping.

BLM's position is there is a rare lack of surface disturbance impacts attributable to well type, subject to showing a distinction, not a mere difference. See, State Director Reviews WY-2010-023, Part 2, p. 3, and

fn. 7, and 2013-005, pp. 2-3. This supports BLM and national policy in 43 CFR 3160 et seq, leasing, APD Form 3160-3, and 2005’s Energy Policy Act (Kreckel 2007). The US Geological Survey noted there is only a remote chance of induced seismic activity from the nations hydraulic fracturing and water injection at volumes contemplated in the PRB.

### 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. 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 2011-2014 for particulate matter (PM), attributed to coal dust. Four sites monitor the air quality in the PRB: Cloud Peak in the Bighorn 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 9 sites throughout the State, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (1 location). The sites monitoring air quality for the Powder River Basin are located at Sheridan, South Coal Reservoir, Buffalo, Fortification Creek, 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. Adgate, et al. advanced a hypothesis that air and water quality effects from HF may negatively impact human health but concluded that “major uncertainties” and a “paucity of baseline data” after drilling 153,260 wells since 2004. They called for more research funding.

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, Ecological Sites, and Vegetation

**Table 3.2. Soils, Ecological Sites, and Acres**

Well Name & No. Pad	Map Unit Symbol	Map Unit Name	Ecological Site
Ethyl Draw 44-17 (west 2/3 of proposed pad)	RED	Renohill-Razor association, rolling	Clayey (Cy) 10-14 NP
Ethyl Draw 44-17 (east 1/3 of proposed pad)	SNf	SNf--Shingle-Worf association	Shallow Loamy (SwLy) 10-14 NP
Road (L x W)	SNF	SNf--Shingle-Worf association	Shallow Loamy (SwLy) 10-14 NP

BLM analyzed the soils data for the project area from the South Johnson County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database (WY619). The BLM uses county soil survey information to predict soil behavior, limitations, or suitability for a given proposal. (Per FEIS, p. 3-78 site specific detail

from SSURGO data and onsite investigations). A tabulated summary of the soil map units impacted by the proposed well and infrastructure, ecological site, and predicted acres disturbed, is above. See the NRCS Soil Survey WY 619 South Johnson County (SSURGO) data for more detailed soil information. Ecological Site interpretations include additional site-specific soil information.

### **Vegetation and Ecological Sites (Pre-Disturbance Vegetation Composition)**

#### **Vegetative Community & Ecological Site**

BLM staff identified the dominant vegetation community types in the project area as a *mixed grass prairie* and *sagebrush shrubland*. Species typical of the mixed-grass prairie community type are western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), needle-and-thread (*Hesperostipa comata*), and Wyoming big sagebrush (*Artemisia tridentate* var. *wyomingensis*), while species typical of the sagebrush shrubland include *Artemisia* spp. (*Chrysothamnus* spp.), western wheatgrass, prairie junegrass (*Koeleria macrantha*), and plains pricklypear (*Opuntia* spp.).

In addition, bluebunch wheatgrass (*Pseudoroegneria spicata*), green needlegrass (*Nassella viridula*) were identified in the project area. Additional forb and shrub species observed during the site visit included yucca (*Yucca glauca*), common yarrow (*Achillea millefolium*), penstemons (*penstemon* spp.), American vetch (*Vicia americana*), and milkvetch (*Astragalus* spp.). Non-native graminoids present included cheatgrass (*Bromus tectorum*), which can be extensive in the project area. Ecological sites and vegetative properties were identified for the project area and depicted above in the Table 3.2. Ecological site descriptions provide site and vegetation information needed for resource identification, management, and reclamation recommendations. To determine the appropriate ecological sites for the area contained within this proposed project area, BLM specialists analyzed data from on-site field reconnaissance and from NRCS published soil survey information.

### **3.3. Water Resources**

WDEQ regulates Wyoming's water quality with EPA oversight. Water for drilling and completion will come from the Eklund 23-1 water supply well located in the NWNE Section 23 T46N R80W. Water will be transported either by truck or via surface pipe line. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting off lease water supply wells.

#### **3.3.1. Groundwater**

There are no oil and gas wells or water injection wells (WIW) in the area. A search of the WSEO Ground Water Rights Database showed 0 registered stock and domestic water wells within 1 mile of the proposed well. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. The 2004 EPA study found it unlikely that hydraulically fractured CBNG wells would contaminate ground water. The EPA has an expansive, on-going study looking at more aspects of hydraulic fracturing and has yet to issue findings. A 2011-2012 Geological Survey study found no groundwater effects from thousands of deep horizontally fractured oil and gas wells. Another study found no direct link between hydraulic fracturing and studied aquifers, Warner, 2012. Adgate, et. al., and news sources reveal a minor controversy over a state's non-disclosure of proprietary HF fluids while release decisions receive administrative and court reviews. The Fox Hills, the deepest penetrated fresh water zone in the PRB lies well above the target formation at 7,895 feet. Page 2 in the Master Drilling Plan shows the depths where casing will be set and cemented in place. The operator will verify that there is competent cement across the aquifer, from 100 feet above to 100 feet below the Fox Hills formation. This will ensure that ground water will not be adversely impacted by well drilling and completion operations.

#### **3.3.2. Surface Water**

The project area is in the Ninemile Creek drainages which are tributaries to the Upper Powder River. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater,

springs, or other surface source – PRB FEIS, Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank. See generally the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49.

#### **3.4. Invasive or Noxious Species**

The operator and BLM 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. Gelbhard, 2003 and Duniway 2010, showed that surface disturbances increase the proliferation of invasive or noxious species out to 0.5 miles or more from the disturbance while correspondingly compromising native communities in the same footprint. Cheatgrass (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. These species are found in high densities and numerous locations throughout NE Wyoming. Balch, 2013, linked the proliferation of cheatgrass in semi-arid environments to the increased frequency and severity of wildfire.

#### **3.5. Fish and Wildlife**

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. BLM performed a habitat assessment in the project area on December 18, 2013. The biologist evaluated impacts to wildlife resources and recommended project modifications where wildlife issues arose. BLM wildlife biologists 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 wildlife species known or likely to occur in the project area that are likely to be impacted by the action. Rationale for any species not discussed in detail below are in the AR.

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

The Buffalo BLM receives a species list periodically from the US Fish and Wildlife Service (FWS) of threatened, endangered, proposed, and candidate species. Species on that list that would be impacted by the proposal are discussed below.

###### **3.5.1.1. 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 project area does not contain suitable habitat for the ULT, and the species is not expected to occur.

###### **3.5.1.2. Greater Sage-Grouse (GSG)**

The PRB FEIS has a detailed discussion on GSG ecology and habitat, pp. 3-194 to 3-199. Subsequently the FWS determined the 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 special status (sensitive) species (SSS) and a WGFD species of greatest conservation need because of population decline and ongoing habitat loss. The 2012 population viability analysis for the Northeast Wyoming GSG found there remains a viable population of GSG in the PRB (Taylor et al. 2012). However, threats from energy development and West Nile virus (WNV) are impacting future viability (Taylor et al. 2012). The BLM IM WY-2012-019 establishes interim management policies for proposed activities on BLM-administered lands, including federal mineral estate, until RMP updates are complete.

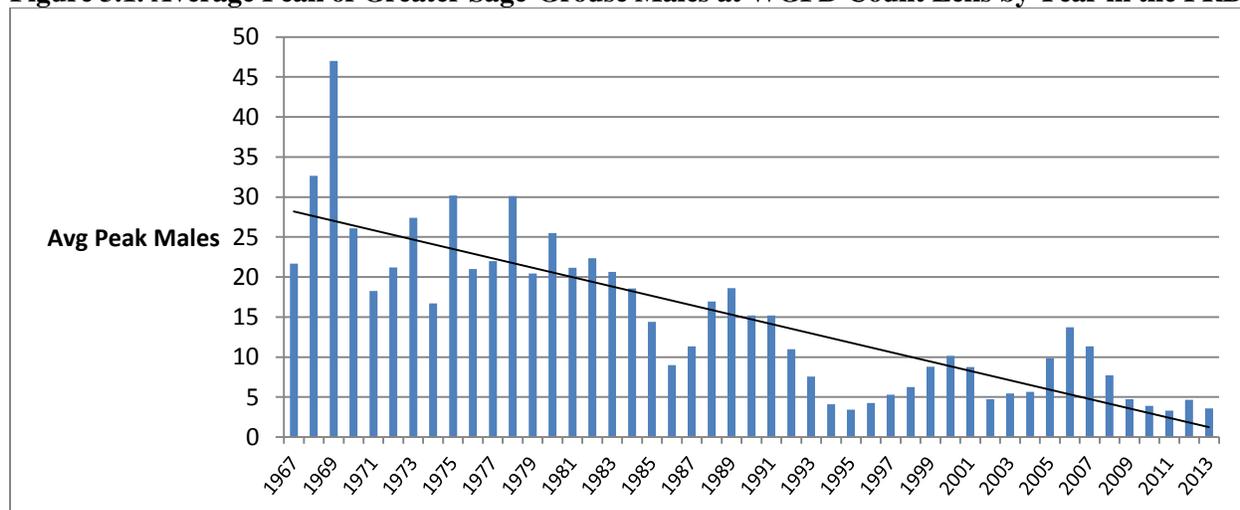
Impacts to GSG from energy development are documented at various scales. The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) implicates that impacts to leks occur within 4 miles of oil and gas developments, and recommends development at a scale of one well per square mile. 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. The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) implicates that impacts to leks occur within 4 miles of oil and gas developments. Impacts from oil and gas development are discernible at the spatial scale of 20 km (12.4 mi) (Taylor et al. 2012). WGFD records show that no GSG leks occur within 4 miles of the project area. The GSG population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2013b). Figure 3.1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that the declines since 2001 are a result, in part, of energy development (USFWS 2010, Taylor et. al. 2012).

*Site Specific Habitat*

The project area is in the Buffalo core population area, as identified in EO 2011-5. GSG habitat models show that the project area contains high quality GSG nesting and winter habitat (Walker et al. 2007). BLM confirmed sagebrush shrublands provide suitable nesting, brood rearing, and winter habitat in the project area. There are no known leks within 4 miles of the proposed infrastructure.

**Figure 3.1. Average Peak of Greater Sage-Grouse Males at WGFD Count Leks by Year in the PRB**



**3.5.2. Special Status (Sensitive) Species (SSS)**

The PRB FEIS discussed the affected environment for SSS, p. 3-174 to 201. The authority for the SSS comes from the ESA, as amended; Title II of the Sikes Act, as amended; the FLPMA; Department Manual 235.1.1A and BLM Manual 6840. Table 1 (see Appendix A, Administrative Record) lists those SSS that may occur in the project area. The Table also includes a brief description of the habitat requirements for each species. Wyoming BLM annually updates its list of SSS to focus management to maintain habitats to preclude listing as a threatened or endangered species. The policy goals are:

- Maintaining vulnerable species and habitat components in functional BLM ecosystems;
- Ensuring sensitive species are considered in land management decisions;
- Preventing a need for species listing under the Endangered Species Act (ESA); and
- Prioritizing needed conservation work with an emphasis on habitat.

Wyoming BLM updates SSS on its website: <http://www.blm.gov/wy/st/en/programs/Wildlife.html>. BLM discusses those SSS impacted beyond the level analyzed in the PRB FEIS, below. Brewer’s sparrow, loggerhead shrike, and sage sparrow are discussed under Migratory Birds, below.

### 3.5.3. Big Game

The big game species occurring in the project area are mule deer and pronghorn. Sagebrush grasslands in the area provide habitat for forage and cover. Both species are expected to use the area year-round, with higher concentrations of mule deer during winter months. The PRB FEIS discussed the affected environment for pronghorn and mule deer, on pp. 3-117 to 3-122 and pp. 3-127 to 3-132, respectively. Table 3.3, below, indicates the delineated seasonal ranges for each species that occur in the project area, the herd units affected by the project, the WGFD population objective, and the WGFD current population estimate for each species (WGFD 2013).

**Table 3.3. Big Game Species, Seasonal Ranges, Herd Units, Population Objectives, and Population Estimates for Big Game Species Likely to Occur in the Ethyl Draw Unit 44-17 Project Area**

Species	Seasonal Range in Project Area	Herd Unit	WGFD Population Objective	% Above (+) or Below (-) Objective	WGFD Report Year
Mule Deer	Winter yearlong, Yearlong	320 – Pumpkin Buttes	11,000	- 12.4%	2012
Pronghorn	Yearlong	318 – Crazy Woman	7,000	+ 73%	2012

### 3.5.4. Plains Sharp tailed Grouse

The PRB FEIS discussed the affected environment for plains sharp-tailed grouse on pp. 3-148 to 3-150. The mosaic of grasslands and sagebrush shrublands that occur in the project area may provide nesting and brood-rearing habitat. The nearest known plains sharp-tailed grouse lek is approximately 18.5 miles northeast of the project area. No plains sharp-tailed grouse were noted in the project area.

### 3.5.5. Raptors

The PRB FEIS discussed the affected environment for raptors, pp. 3-141 to 3-148. According to the BLM raptor database, 2 raptor nests (#433 unknown species and #444 red-tail hawk) occur within 0.5 miles of the project boundary. Both nests are outside of 0.5 miles from the proposed well pad, but nest #433 is within 0.25 miles and line of sight of the proposed access road. 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.

### 3.5.6. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds, pp. 3-150 to 3-153. A wide variety of migratory birds may occur in the proposed project area at some point during the year. Migratory birds are birds that migrate for breeding and foraging during the year. The BLM-FWS Memorandum of Understanding (MOU) (2010) promotes the conservation of migratory birds, complying with Executive Order 13186 (Federal Register V. 66, No. 11). BLM encourages voluntary design features and conservation measures supporting migratory bird conservation, in addition to appropriate restrictions.

Habitats occurring near the proposed well location include sagebrush steppe grasslands and mixed grass prairie. Many species that are of high management concern use these areas for their primary breeding habitats (Saab and Rich 1997). Nationally, grassland and shrubland birds declined more consistently than any other ecological association of birds over the last 30 years (WGFD 2009). The FWS's Birds of Conservation Concern (BCC 2008) report identifies species of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. Species in this list that have the potential to nest or forage in the project area are: bald eagle, ferruginous hawk, golden eagle, prairie falcon, mountain plover, upland sandpiper, long-billed curlew, burrowing owl, short-eared owl, loggerhead shrike, sage thrasher, Brewer's sparrow, grasshopper sparrow, and McCown's longspur. Several migratory species are also BLM special status (sensitive)

species (SSS). Those known or suspected of occurring in the project area include Brewer's sparrow, ferruginous hawk, loggerhead shrike, long-billed curlew, mountain plover, sage sparrow, sage thrasher, and western burrowing owl.

### **3.6. Cultural Resources**

Per Section 106 of the National Historic Preservation Act, BLM must consider impacts to historic properties (sites that are eligible for or listed on the National Register of Historic Places (NRHP)). For an overview of cultural resources found in the area, refer to the Draft Cultural Class I Regional Overview, Buffalo Field Office (BLM, 2010). A Class III (intensive) cultural resource inventory (BFO project no. 70140042) was performed to locate specific historic properties which may be impacted by the proposal. Based on historical records the assumed location for the Bozeman Trail (48JO134, listed on the NRHP) is near the proposed access road for the project. The inventory did not locate any contributing portions (typically expressed as wagon ruts) of the trail in or near the project area.

## **4. ENVIRONMENTAL EFFECTS**

**No Action Alternative.** BLM analyzed the no action alternative as Alternative 3 in the PRB FEIS and it subsequently received augmentation of the effects analysis in this EA through the analysis of mineral projects, their approval, and construction; and through the analysis and approval of other projects. Present fluid mineral development in the PRB is under half of that envisioned and analyzed in the PRB FEIS. There is only a remote potential for significant effects above those identified in the PRB FEIS to resource issues as a result of implementing the no action alternative.

### **Alternative B, 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. BLM incorporates by reference the analysis found in the August 2012 Lease Sale EA, WY-070-EA12-44, pp. 45-51 (air quality, greenhouse gas emissions, and visibility). 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 well within the projected development parameters.

#### **4.2. Soils, Ecological Sites, and Vegetation**

##### **4.2.1. Soils and Vegetation**

###### **4.2.1.1. Direct and Indirect Effects**

The PRB FEIS analyzed direct and indirect impacts to soils associated with fluid mineral development. For these affects refer to p. 4-134-149 of the PRB EIS.

### **Construction Activities**

The greatest impacts to the soil resources associated with this project would occur with the construction of the well pad and road. Construction of these requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. 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 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 proposed APD requires a 5.7 acre well pad to safely drill the proposed well. During the construction and drilling phase of the project, the operator plans to maintain cut and fill slopes at 1½:1(67%), 2:1(50%) slopes. These constructed slopes will be bare ground void of vegetation thus identified as highly erosive due to water erosion, and the total 5.7 acres site is classified as highly erosive for wind erosion. The predicted construction cut depth exceeds the identified soil depth, thus impacting soil horizons described as “little affected by pedogenic processes”, or unaltered parent material. The physical and chemical properties of this material may be variable and limiting in its potential to support plant growth, variable in erosion potential and suitability for construction material. The 5.7 acre disturbance area would be defined as an LRP area per Wyoming Reclamation Policy, and p. 4-143 and 4-149 of the PRB-EIS.

The well pad will be reduced to 1.8 acres of disturbance at interim reclamation for the production phase. See Exhibit IX for an illustration of the well pad reduction as per Onshore Oil and Gas Order Number 1 Surface Use Plan of Operations. Cut slopes and fill slopes will be maintained at 2:1 and 3:1 respectively as per programmatic conditions of approval. Road running surface is 18 feet with the remaining right-of-way (ROW) to be re-contoured and seeded. Pipeline ROW’s will be re-contoured stabilized and reseeded immediately after installation. The operator committed measures listed in the mitigation measures 4.4.4 section of this document may help reduce the potential impacts to the soil resource to levels described in the PRB-FEIS.

Changes in soil productivity would depend on the success of the stabilization and interim reclamation efforts. The replaced soil could support stable and productive vegetation adequate in quantity and kind to support the post disturbance land uses- wildlife habitat and rangeland. After reclamation (interim and final), the soils would be unlike the predisturbance soils in structure, horizon, bulk density, and chemical composition. The new soils would be more uniform in type, thickness and texture than the predisturbance soils. The soil-forming processes would be disturbed, resulting in the alteration of soil characteristics and, consequently, the taxonomic classification of the soils. Productivity capabilities, biologic activity, and nutrient content also would be affected.

#### **4.2.1.2. Cumulative Effects**

The PRB FEIS defined the duration of disturbance, pp. 4-1 and 4-15. The impacts to the soil resource described in the direct and indirect effects section could be minimized by reducing initial surface disturbance, successful site stabilization and maximum interim reclamation, as committed to by the operator in their POD Surface Use Plan and as required by the BLM in COAs. (Total initial and long term disturbance) PRB-FEIS 4-134. Most of the disturbance associated with the construction of well pads would be short term. See Exhibit IX in the MSUP for production phase pad design (interim reclamation phase), and section 4.4.2.

#### **4.2.1.3. Mitigation Measures**

The operator will reduce impacts to vegetation and soils from surface disturbance by following its plans (MSUP, and (design features, engineered designs), Storm Water Pollution Prevention Plan (SWPPP) requirements, reclamation plan and the BLM Wyoming Reclamation Policy). These practices, as well as other approved mitigation measures will results in less surface disturbance and environmental impacts. In addition the following site specific COAs will be added as mitigation.

1. The entire access road must be fully built (including all water control structures such as wing ditches, culverts, relief ditches, turnouts, surfacing, etc.) and functional to BLM standards prior mobilizing the drilling equipment to the well location.
2. Re-contouring and interim reclamation will be initiated as soon as is practicable but not more than 6 months from the date of the well completion incorporating stored soil material into that portion of the well pad not needed for well production; exception(s) may be granted with sufficient justification.
3. At the time of interim reclamation, all topsoil will re-spread across the reduced cut and fill slopes; no topsoil is to be stored long-term.

4. Soil compaction will be remediated on all compacted surfaces and prior to the redistribution of topsoil on disturbed surfaces to the depth of compaction by methods that prevent mixing of the soil horizons. BLM's recommended methods are subsoiling, paraplowing, or ripping with a winged shank. Scarification is acceptable on areas identified as very shallow or shallow soils.

#### **4.2.1.4. Residual Effects**

The PRB FEIS identified residual effects (p. 4-408). Residual effects across the project area would include a long-term loss of soil productivity associated with well pads and roads. Alteration of soils would result in the formation of new soil with different properties. Post disturbance productivity should be similar to predisturbance. 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.

### **4.2.2. Vegetation and Ecological Sites**

#### **4.2.2.1. 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 existing plant communities, species richness, diversity, and structure 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 practices. Short term effects would occur where vegetated areas are disturbed but later reclaimed as soon as practical from initial disturbance. Long-term effects would occur where well pads, roads, and other semi-permanent facilities, resulting in loss of vegetation and prevent reclamation for the life of the project. Other impacts include a reduction in the utility of interim reclaimed areas because of reduced species and landscape diversity on reclaimed sites, increased soil erosion, and habitat loss for wildlife and livestock.

#### **4.2.2.2. 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.

#### **4.2.2.3. Mitigation Measures**

Implementation of operator's MSUP (specifically Plans for Reclamation of the Surface), agreed to COAs, and mitigation measures described in the operator's Integrated Weed and Pest Management Plan will reduce surface disturbance impacts to ecological sites and vegetation. See the administrative record.

#### **4.2.2.4. Residual Effects**

Residual effects were also identified in the PRB FEIS, p. 4-408. Including loss of vegetative cover during construction, interim reclamation and long-term on well location and access road. The potential spread and establishment of weeds, and alteration of species biodiversity until successful final reclamation. Successful interim reclamation should create a stable functioning ecosystem that prepares the site for eventual final reclamation, which would reduce the residual effects of the proposed action.

### **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. Surface casing will be set at 4,550'. Compliance with the drilling and completion plans and Onshore Oil and Gas Orders Nos. 2 and 7 minimize an adverse impact on ground water. The volume of water produced by this federal mineral development is unknowable at the time of permitting. Page 2 in the Master Drilling Plan shows the depths where casing will be set and cemented in place. The operator will verify that there is competent cement across the aquifer, from 100

feet above to 100 feet below the Fox Hills formation. The depth of the Fox Hills is 7,895. This will ensure that ground water will not be adversely impacted by well drilling and completion operations.

BHE 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, the operator 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. The quality of water produced in association with conventional oil and gas historically was such that surface discharge would not be possible without treatment. Initial water production is quite low in most cases. There are 3 common alternatives for water management: re-injection, deep disposal, or disposal into pits. All alternatives would be protective of groundwater resources when performed in compliance with state and federal regulations.

#### **4.4. Invasive Species**

##### **4.4.1. Direct and Indirect Effects**

The operator committed to the control of noxious weeds and species of concern using the following measures identified in their Integrated Pest Management Plan (IPMP): 1) Control Methods, including frequency; 2) Preventive practices; and 3) Education. Cheatgrass (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. The use of existing facilities along with the surface disturbance from the construction of proposed access roads, pipelines, and related facilities would present opportunities for weed invasion. 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, applicant committed measures will reduce potential impacts from noxious weeds and invasive plants.

##### **4.4.2. Cumulative Effects**

Cumulative effects resulting from noxious and invasive weed species are discussed in the PRB FEIS, p. 4-171.

##### **4.4.3. Mitigation Measures**

Successful reclamation through application of the operator's reclamation plans will discourage establishment of invasive species during operations. In addition, measures incorporated into the programmatic COAs listed in the COA document will further mitigate the potential spread and establishment of weed species. The operator will be responsible for prevention and control of noxious weeds and weeds of concern on all areas of surface disturbance associated with this project (well locations, roads, water management facilities, etc.). Use of pesticides shall comply with the applicable federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of Interior. Prior to the use of pesticides on public land, the holder shall obtain from the BLM authorized officer written approval of a plan showing the type and quantity of material to be used, pests to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer to such use.

##### **4.4.4. Residual Effects**

Control efforts by the Operator would be limited to the surface disturbance associated the construction and operation of the project. Cheatgrass and to a lesser extent, Japanese brome (*Bromus japonicus*) are found in high densities and numerous locations throughout northeast Wyoming. Efforts are being made by BLM, USDA, WGFD and other partners at some small infestation areas are being treated but for the most part, control programs are not considered feasible at this time and these annual bromes will continue to be found within the project area.

## **4.5. Fish and Wildlife**

### **4.5.1. Wildlife Threatened, Endangered, Proposed and Candidate Species**

#### **4.5.1.1. Threatened and Endangered Species**

Suitable habitat for ULT is not present in the foreseeable activity and project area. Implementation of the proposed project will have “no effect” on ULT.

#### **4.5.1.2. Greater Sage-Grouse (GSG)**

##### **4.5.1.2.1. Direct and Indirect Effects**

The PRB FEIS discusses impacts to GSG on pp. 4-257 to 4-273. Implementation of the proposal will impact GSG habitat and individuals. Impacts to GSG are generally a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. Research indicates that GSG hens also avoid nesting in developed areas. Impacts to GSG associated with energy development are discussed in detail in the 12-Month Findings for Petitions to List the Greater Sage-Grouse (*Centrocercus urophasianus*) as Threatened or Endangered (FWS 2010) and chapters 15-21 of Greater Sage-grouse Ecology and Conservation of a Landscape Species and its Habitats (Knick and Connelly 2011).

Construction of the well and the associated infrastructure will cause fragmentation of sagebrush stands and result in the direct loss of approximately 15 acres of GSG habitat. Noise and human disturbance associated with roads, construction, drilling, and completion will be disruptive to GSG. BHE describes activities that will occur during drilling and completion of proposed wells in its SUPO and drilling plan for the Ethyl Draw Unit 44-17 well. BHE estimates that drilling will last approximately 45 days, with completion taking an additional 30 days (Drilling Plan, p. 5). Implementation of the project will adversely impact nesting habitat, both through direct loss and avoidance of the area by GSG due to fragmentation and anthropogenic activity.

It is the policy of BLM WY to manage GSG habitats consistent with Instruction Memorandum (IM) No. WY-2012-019, *Greater Sage-Grouse Habitat Management Policy on Wyoming Bureau of Land Management (BLM) Administered Public Lands Including the Federal Mineral Estate*. IM 2012-019 states that for areas inside of core and connectivity habitats, “Surface occupancy and/or disruptive activities are prohibited on or within a six tenths (0.6) mile radius of the perimeter of occupied sage-grouse leks. Surface disturbing and/or disruptive activities are prohibited from March 15–June 30 to protect sage-grouse nesting and early brood rearing habitat. Apply this restriction to all nesting and early brood-rearing habitats inside core areas regardless of distance from the lek.”

BHE completed a Density and Disturbance Calculation (DDCT) in conformance to Wyoming EO 2011-5. The DDCT determined the level of existing surface disturbance and disturbance density in a pre-defined analysis area (4 mile buffer of the Ethyl Draw Unit 44-17 well, within the core area boundaries). Both the disturbance density (0.02/640) and surface disturbance (2.46%) levels were found to be in compliance with EO 2011-5 stipulations, as determined by WGFD (letter dated May 1, 2013). See the AR for the DDCT, associated maps, and WGFD conformance letter.

Studies show that intermittent noise (such as that associated with traffic) can have a greater impact on GSG than continuous drilling noise, and causes immediate reduction in attendance at leks (Blickley et al. 2012). Light vehicular traffic (1–12 vehicles per day) is shown to substantially reduce nest initiation rates and increase the distance of nests from lek sites (Lyon and Anderson 2003). Holloran (2005) found that traffic on roads within 0.8 miles of a lek during the early morning while males are strutting is related to declines in male attendance. BHE has committed to only travel the access road from the hours of 8 a.m. to 6 p.m. during the breeding season (March 1 – May 15) for the life of the project. This timing limitation is not likely to reduce impacts to grouse that may be nesting or roosting near roads in the project area.

Research identified reductions in road and well pad construction, vehicle traffic, industrial noise (Lyon

and Anderson 2003; Holloran 2005), and the management of produced water to prevent the spread of mosquitoes with the potential to vector West Nile virus in GSG habitat (Walker et al. 2007), as effective strategies to reduce impacts on GSG. The BLM biologist recommends that surface disturbing and disruptive activities occur outside of the breeding/nesting season (March 15 – June 30) in order to be in compliance with WY BLM policy or the State of Wyoming’s Greater Sage-Grouse conservation strategy (Executive Order (EO) 2011-5 Greater Sage-grouse Core Area Protection). During onsite visits, the BLM and WGFD made specific recommendations to avoid placement of facilities in sagebrush to reduce direct loss of GSG habitat. This included recommendations to consolidate infrastructure where feasible. The BLM and WGFD also made recommendations for mitigation measures to ensure compliance with EO 2011-5. BHE accepted the majority of recommendations and has incorporated them into their SUPO as operator committed measures. BHE’s operator committed measures that reduce impacts to GSG are:

- BHE will conduct all surface disturbing and disruptive activities outside the GSG breeding nesting season (March 15 – June 30) and will keep the removal of sagebrush to a minimum. (SUPO, item 12.)
- The reclamation seed mix contains 2 native grasses (at least 1 bunchgrass) and 2 native forb species, which is consistent with the general stipulations of EO 2011-5. (SUPO, p. 5)
- Travel on the project access roads will be restricted to the hours of 8am - 6pm during the GSG breeding season (March 1 - May 15) in order to reduce noise from vehicle traffic. (SUPO, item 12.)

#### **4.5.1.2.2. Cumulative Effects**

The PRB FEIS (BLM 2003) states that “the synergistic effect of several impacts would likely result in a downward trend for the GSG 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 (pg. 4-270).” Based on the impacts described in the PRB FEIS and the findings of recent research, the proposal may potentially contribute to the extirpation of the local GSG population.

Declines in lek attendance associated with oil and gas development may be a result of a suite of factors including avoidance (Holloran et al. 2005, Holloran et al. 2007, Aldridge and Boyce 2007, Walker et al. 2007, Doherty et al. 2008, WGFD 2009), loss and fragmentation of habitat (Connelly et al. 2000, Braun et al. 2002, Connelly et al. 2004, WGFD 2004, Rowland et al. 2005, WGFD 2005, Naugle et al. 2011), reductions in habitat quality (Braun et al. 2002, WGFD 2003, Connelly et al. 2004, Holloran et al. 2005) and changes in disease mechanisms (Naugle et al. 2004, WGFD 2004, Walker et al. 2007.).

The Buffalo Resource Management Plan (BLM 2001) and the PRB FEIS Record of Decision (BLM 2003) included a 2-mile timing limitation on surface-disturbing activities around GSG leks. The 2-mile measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA) (BLM 2004). Wyoming BLM adopted the 2-mile recommendation in 1990 (BLM 1990). The 2-mile recommendation was based on early research which indicated between 59% and 87% of GSG nests were located within 2 miles of a lek (BLM 2004). These studies were conducted in vast contiguous stands of sagebrush, such as those that occur in Idaho’s Snake River plain.

Additional research across more of the GSG’s range has since indicated that nesting may occur much farther than 2 miles from the breeding lek (BLM 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported that only 45% of their GSG hens nested within 1.9 miles of the capture lek. Moynahan and Lindberg (2004) found that only 36% of their GSG hens nested within 1.9 miles of the capture lek. Habitat conditions, and, thus, GSG biology, in the PRB area are more similar to Moynahan’s north-central Montana study area than the Upper Green River area. Moynahan’s study area occurred in mixed-grass prairie and sagebrush steppe, dominated by Wyoming big sagebrush (Moynahan et al. 2007). Recent research in the PRB suggests that impacts to leks from energy development are discernible out to a minimum of 4 miles, and that some leks in this radius have been extirpated as a direct result of energy development (Walker et al. 2007, Walker 2008, Naugle et al. 2011). BLM determined,

based on these studies, that a 2-mile timing limitation is insufficient to reverse the population decline. Current research does not identify specific components of energy development that measurably decrease impacts to GSG or their habitats. Even in areas where a variety of mitigation measures were applied, negative population impacts were still measurable when well density exceeded 1 well per square mile. Management of energy development based on current core area configurations and associated lease stipulations, conditions of approval, and best management practices (BMPs), may not be sufficient to protect the population viability of PRB GSG.

Based on the summary of research describing the impacts of energy development on GSG, efforts to reduce habitat loss and fragmentation are likely to be the most effective in ensuring long-term lek persistence. Rather than limiting mitigation to only timing restrictions, more effective mitigation strategies may include, at a minimum, burying power lines (Connelly et al. 2000b); minimizing road and well pad construction, vehicle traffic, and industrial noise (Lyon and Anderson 2003, Holloran 2005); managing produced water to prevent the spread of mosquitoes with the potential to vector WNV in GSG habitat maintaining extensive stands of sagebrush habitat over large areas (at least 1 mile in size) around leks (Walker et al 2007); locating energy facilities at least 2 miles from active leks Connelly et al. (2000).

The 2012 population viability analysis for the NE Wyoming GSG found 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 CBNG 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 sage-grouse population that has already experienced an 82% decline within the expansive energy fields.” (Taylor et al. 2012).

Current well densities reduce the effectiveness of PRB core areas (Taylor et al. 2012). Continued energy development around the core areas will reduce PRB core areas remaining value. WNV outbreaks combined with energy development reduce sage-grouse populations and interact to exacerbate population declines. The effects of one WNV outbreak year could cut a population in half. Absent a WNV outbreak, or another 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).

#### **4.5.1.2.3. Mitigation Measures**

No mitigation beyond the operator committed measures is proposed with alternative B.

#### **4.5.1.2.4. Residual Effects**

A timing limitation restricting surface disturbance and disruptive activities does not mitigate habitat loss, fragmentation or changes in disease mechanisms. Noise and human disturbance resulting from maintenance and production activities are likely to impact GSG nesting in the area for the life of the project. Suitability of the project area for GSG will be negatively affected due to habitat loss, fragmentation, and proximity of human activities associated with oil and gas development.

The PRB FEIS predicted that the PRB oil and gas development would have significant impacts to the GSG population. The impact of the proposed project development cumulatively contributes to the potential for local GSG extirpation. Alternative B is consistent with current BLM and Wyoming GSG conservation strategies and the anticipated effects are within the parameters of the PRB FEIS/ROD.

#### **4.5.2. Special Status (Sensitive) Species (SSS)**

The PRB FEIS discusses impacts to SSS on pp. 4-257 to 4-265. The effects to sensitive species resulting from implementation of the project are available in the AR. Brewer's sparrow, loggerhead shrike, sage thrasher, and sage sparrow are addressed under migratory birds (Section 4.6.3).

#### **4.5.3. Big Game**

##### **4.5.3.1. Direct and Indirect Effects**

The PRB FEIS discusses impacts, including direct and indirect effects, cumulative effects, and residual effects to big game on pp. 4-181 to 4-215. Effects to big game from surface disturbing and disruptive activities associated with development of oil wells were analyzed in the Simba Fed 20-44H EA, WY-070-EA12-061, 2012, Section 4.9.4, pp. 17-18, and in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.1, pp. 27-38, all incorporated here by reference. Activities associated with this proposal are anticipated to be similar in nature, with the additional site-specific information. Mule deer and pronghorn would be directly disturbed with the construction of the proposal. Long term disturbance would be direct habitat loss. Short-term disturbances also result in direct habitat loss of approximately 15 acres of sagebrush habitat; however, they should provide some habitat value as these areas are reclaimed and native vegetation becomes established.

##### **4.5.3.2. Cumulative Effects**

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS, p. 4-181 to 4-215.

##### **4.5.3.3. Mitigation Measures**

No mitigation is proposed with Alternative B.

##### **4.5.3.4. Residual Effects**

No residual impacts are anticipated.

#### **4.5.4. Migratory Birds**

##### **4.5.4.1. Direct and Indirect Effects**

The PRB FEIS discussed direct and indirect effects to migratory birds on pp. 4-231 to 4-235. Effects to migratory birds from surface disturbing and disruptive activities associated with development of oil wells were analyzed in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.2.2, pp. 31-33, incorporated here by reference. Activities associated with development of Ethyl Draw Unit 44-17 well are anticipated to be similar in nature, with the following additional site-specific information. Habitat disturbance and disruptive activities (i.e. drilling, construction, completion, operations, and maintenance) resulting from the project are likely to affect migratory birds in the area. BLM identified suitable nesting habitat present for several BLM sensitive sagebrush obligates (Brewer's sparrow, sage sparrow, sage thrasher). Construction of the well pad and access road will remove habitat and could kill BLM sensitive migratory birds, or destroy eggs. Approximately 15 acres of native habitats would be lost directly with the construction of well pads and access roads. Surface disturbing activities that occur in the nesting season may kill migratory birds. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Pad construction, drilling, and to a lesser degree production, would displace edge-sensitive migratory birds from otherwise suitable habitat adjacent to the well pad.

Migratory bird species in the PRB nest in the spring and summer and are vulnerable to the same effects as GSG and raptor species. Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where GSG or raptor nesting timing limitations are applied, nesting migratory birds are also protected. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable. Surface disturbing activities associated with the Ethyl Draw Unit 44-17 project will have GSG and raptor timing limitations applied, thereby providing

protection to migratory birds until June 30. BHE committed to remove BLM sensitive migratory bird habitat outside the typical breeding season (May 1 – July 31), unless a clearance survey is conducted (SUPO, p. 7). The restriction on habitat removal reduces the risk that active nests will be destroyed, as most nestlings will have fledged by August 1, and that the BLM and BHE conform to the MBTA, the BLM-FWS MOU, and BLM IM No. 2013-005.

Heater treaters, and similar facilities with vertical open-topped stacks or pipes, can attract birds. Facilities without exclusionary devices pose a mortality risk. Once birds crawl into the stack, escape is difficult and the bird may become trapped (U.S. v. Apollo Energies Inc., 611 F.3d 679 (10th Cir. 2010); see also Colorado Oil and Gas Commission, Migratory Bird Policy, accessed February 13, 2012). BHE committed to install bird-exclusion devices on all heater treaters and similar production facilities (SUPO, p. 7).

#### **4.5.4.2. Cumulative Effects**

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

#### **4.5.4.3. Mitigation Measures**

No mitigation beyond the operator committed measures is proposed with alternative B.

#### **4.5.4.4. Residual Effects**

Nests initiated after the first week in July may be destroyed by construction after August 1st. Migratory birds nesting adjacent to the well pad or road may be disturbed by construction and production activities. A timing limitation does nothing to mitigate loss and fragmentation of habitat. Suitability of the project area for migratory birds will be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with oil and gas development.

#### **4.5.5. Raptors**

##### **4.5.5.1. Direct and Indirect Effects**

The PRB FEIS discussed direct and indirect effects to raptors, pp. 4-216 to 4-221. Effects to raptors from surface disturbing and disruptive activities associated with development of oil wells were analyzed in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.2.1, pp. 28-31, incorporated here by reference. Activities associated with development of Ethyl Draw Unit 44-17 well are anticipated to be similar in nature, with the following additional site-specific information. This project would result in disturbance in close proximity of nesting raptors, including direct and indirect habitat losses associated with declines in habitat effectiveness. Human activities in proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If mineral activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to overheating or chilling of eggs or chicks. Prolonged disturbance can also lead to the abandonment of the nest. Either action can result in egg or chick mortality. BLM recommends the location of all infrastructures requiring human visitation be designed to provide an adequate biologic buffer for nesting raptors. A biologic buffer is a combination of distance and visual screening providing nesting raptors with security such that routine activities preclude flushing the raptors.

The well is proposed within 0.5 miles of nest #s 433 and 444. Nest #444 is outside the FWS recommended buffer for red-tailed hawk (0.25 miles), and also out of line of sight of the well and road. Nest #433 is 0.18 miles from the proposed access road, but over 0.5 miles from the proposed well pad. Based on size of the nest, the nest is likely to be used by red-tailed hawks or owls. The distance from the proposed well to the nests is expected to be adequate to reduce impacts to the nest from human activities at the well pad during the production phase of the project, even if a more sensitive raptor such as the golden eagle were to take over the nest. The BLM biologist did not recommend re-routing of the road in

order to minimize additional habitat loss for GSG. The distance of the road to the nest should be adequate to protect the nest from failure given that the trucks are not likely to be stopping within 0.5 miles the nest.

#### **4.5.5.2. Cumulative Effects**

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

#### **4.5.5.3. Mitigation Measures**

To reduce the risk of decreased productivity or nest failure, the BLM recommends a 0.5-mile radius timing limitation for surface disturbing and disruptive activities during the breeding season around active raptor nests.

#### **4.5.5.4. Residual Impacts**

Even with timing restrictions, raptors may abandon nests due to foraging habitat alteration associated with development or sensitivity to well or infrastructure placement. All raptors using nests in the vicinity of the project would likely be impacted to some extent by the human disturbance associated with operation and maintenance of the project. Routine human activities near these nests can draw increased predator activity to the area and increase nest predation. Declines in breeding populations of some species that are more sensitive to human activities may occur.

### **4.5.6. Plains Sharp-tailed Grouse**

#### **4.5.6.1. Direct and Indirect Effects**

Direct and indirect effects to sharp-tailed grouse are described in the PRB FEIS pp. 4-221 to 4-226 and are expected to be similar to those described in section 4.6.1.2 (GSG). Sharp-tailed grouse may avoid habitats adjacent to the project area. The nearest known lek is not expected to be impacted. Construction and maintenance activities associated with development of the proposed project will cause direct habitat loss and fragmentation. Suitability of the project area for sharp-tailed grouse would be negatively affected due to habitat loss and fragmentation and proximity of human activities associated with energy development.

#### **4.5.6.2. Cumulative Effects**

The PRB FEIS described the cumulative effects to sharp-tailed grouse, pp. 4-221 to 4-226.

#### **4.5.6.3. Mitigation Measures**

No mitigation is proposed with alternative B.

#### **4.5.6.4. Residual Impacts**

No residual impacts are anticipated.

### **4.6. Cultural Resources**

#### **4.6.1. Direct and Indirect Effects**

BLM policy states that a decision maker's first choice should be avoidance of historic properties (BLM Manual 8140.06(C)). If historic properties cannot be avoided, mitigation measures must be applied to resolve the adverse effect. No historic properties will be impacted by the proposal. Following the State Protocol Between the Wyoming Bureau of Land Management State Director and The Wyoming State Historic Preservation Officer, Section VI(A)(1), the BLM notified the Wyoming State Historic Preservation Officer (SHPO) on February 25, 2014 that no historic properties exist in the area of potential effect (APE). If any cultural values (sites, features or artifacts) are observed during operation, they will be left intact and the Buffalo Field Manager notified. If human remains are noted, the procedures described in Appendix L of the PRB FEIS must be followed. Further discovery procedures are in Standard COA (General)(A)(1).

**4.6.2. Cumulative Effects**

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

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

**4.6.3. 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.

**4.6.4. 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 Analysis; OSP (Onsite Presence):**

Contact	Organization	OSP?
Mary Hopkins	Wyoming State Historic Preservation Officer	No

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