DECISION RECORD
O'Brien Energy Resources, Clark #1, Application for Permit to Drill (APD)
Environmental Assessment (EA), WY-070-14-45
Bureau of Land Management, Buffalo Field Office, Wyoming

DECISION. The BLM approves O'Brien Energy Resources (O'Brien) Clark #1 gas and oil well application for permit to drill (APD) described in Alternative B of the environmental assessment (EA), WY-070-14-45, incorporated here by reference. This approval includes the well's 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 Resource Management Plan (RMP) 1985 and Amendments.
- Buffalo and Powder River Basin Final Environmental Impact Statements (FEISs) 1985, 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 1 APD and support facilities:

	Well Name	Well #	Qtr	Sec	Twp	Rng	Lease #
1	Clark #1	Clark #1	SESE	22	51N	70W	WYW181073

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-EA14-45, and the FONSI (incorporated here by reference) found O'Brien's proposal for Clark #1 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 APD for 30 days, received no comments, and then internally scoped it. Since receipt of these APD BLM received a policy clarification on Greater Sage-Grouse (GSG) conservation, and NOS/APD processing.

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

1. BLM and O'Brien included mitigation measures to reduce environmental impacts while meeting the BLM's need. For a complete description of all site-specific COAs, see the COAs.
2. The impact of this project cumulatively contributes to the potential for local Greater Sage-Grouse (GSG) extirpation yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS/ROD. In this case there is an existing improved road within 0.25 miles of the occupied GSG Deer Creek Lek - currently authorized and used to access 8 conventional oil wells. An alternate access to the Clark #1 well was considered but eliminated because coordination with the Wyoming Game and Fish Department (WGFD) revealed that the WGFD preference was approving the existing road (December 16, 2013). The existing road will not receive substantial improvements and currently receives heavy truck traffic; thus; it would not be considered a new surface facility. There is no alternative road to the well. Occupancy in the controlled surface use (CSU) of the lek will also be restricted during the GSG breeding season for the project's life. This decision conforms to BLM and Wyoming GSG conservation strategies as it supports the recommendations and population objectives of the WGFD, and incorporates mitigation to reduce impacts to GSG. Compliance with the COAs and

operator committed measures should provide protection to the Deer Creek Lek during the breeding season. O'Brien committed to travel the road outside of the hours of 6 p.m. to 8 a.m. from March 15 – May 15 in order to mitigate noise impacts from traffic to breeding GSG.

3. To reduce the likelihood of a "take" under the Migratory Bird Treaty Act, BLM sensitive species nesting habitat removal will occur outside of the breeding season or be cleared by survey.
4. O'Brien 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 because it is amidst development.

This APD is pursuant to the Mineral Leasing Act for developing oil or gas and does not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390 because the proposed drilling is at a site where drilling occurred more than 5 years from possibly spudding 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: 12/19/13

FINDING OF NO SIGNIFICANT IMPACT
O'Brien Energy Resources, Clark #1
Environmental Assessment (EA), WY-070-14-45
Bureau of Land Management, Buffalo Field Office, Wyoming

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-14-45, 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 (2011). 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 because it is amidst mineral development. 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: 12/19/13

ENVIRONMENTAL ASSESSMENT (EA), WY-070-14-45
O'Brien Energy Resources, Clark #1, Application for Permit to Drill (APD)
Bureau of Land Management, Buffalo Field Office, Wyoming

1. INTRODUCTION

BLM provides an EA fo**r** O'Brien Energy Resources (O'Brien) Clark #1 oil and gas well application for permit to drill (APD). BLM's jurisdiction here is fee (non-federal) surface – overlying federal minerals "split estate" also termed, federal lands. This analysis tiers into and incorporates by reference 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 (2011) 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. 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 drilling is at a site where drilling occurred more than 5 years from possibly spudding 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 APD: the site-specific analysis, and mitigation. Fourth is the monitoring and reclamation of wells and their features. (Pendery 2010)

1.1. Background

The pre-approval notice of staking (NOS) onsite was conducted on March 14**, 2013.** The O'Brien Clark #1 **APD was received on June 27, 2013.** The project post APD deficiency letter was sent out on June 28**, 2013.** On September 23**, 2013 O'Brien submitted deficiencies for the Clark #1 project.** BLM shared the proposed COAs with the operator in December 2013.

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. 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, AR), 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 is amidst mineral development. See AR (administrative record) for a distillation of project issues.

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 usually 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's analysis area.

2.2. Alternative B Proposed Action (Proposal)

Overview. O'Brien proposes drilling and developing 1 vertical oil well into federal mineral estate from a proposed fee surface location in Campbell County, WY. The project would be subject to the conditions-of-approval (COAs) for drilling of a split estate oil well in the BFO jurisdiction. For a detailed description of design features and construction practices associated with the proposed project, refer to the APD's surface use plan (SUP) and drilling plan. Also see the subject APD for maps showing the proposed well location and associated facilities for the Clark #1 well. The proposed well is 17.3 miles east of Gillette, Wyoming on Interstate 90. Exit at Adon Road and travel north for 7.4 miles. Turn left and travel westerly on existing gravel road for 1.0 miles. Turn left on existing gravel road for 0.6 miles to the entrance of the new access to the location. The primary objective is to drill to the Minnelusa Formation at 8,650 feet total vertical depth. See Table 2.1, below, and Figure 2, Project Map, AR, for further detail.

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

#	Well Name & #	Twp	Rng	Sec	Qtr	Lease #
1	Clark #1	51	70W	22	SESE	WYW-181073

Drilling, Construction and Production Design Features Include:

- The well is expected to be drilled in winter of 2014 and will take approximately 18 days to drill, and completion operations will commence 8 days after drilling.
- During drilling an impervious liner will be installed in the reserve pit in order to avoid drilling water loss through seepage.
- Potential production facilities including a pumping unit, production tank battery, water tanks and heater treater located on the cut portion of the well pad, a minimum of 20 feet from the toe of the back cut.
- During the drilling phase the total disturbance is expected to be 3.2 acres (3.5 acres total including access and electrical power). During the production phase it is anticipated that the total disturbance of the location will be 1.3 acres. Operator anticipates reclaiming 1.9 acres or 61% of total disturbance for the interim reclamation phase.

Drilling and Completion Water Sources and Amounts
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.

O'Brien estimates that during the drilling phase of this well it may use up to 8,000 barrels of water for drilling and 50 for completion. The operator estimates (about a 3-4 week period) the average daily traffic (ADT) for drilling and completion to and from the location is approximately 3 large trucks (water haulers, cement trucks, etc.) and 4-6 personal pickup trucks per day. During the production phase the ADT will decrease to 1pickup trucks per day and 1-2 large trucks per day. 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[1]
Drilling (24/7)	28 days[2]
Schedule/logistics for completion	30 days
Completion (setup, completion, demobilization)	5-8 days

[1] Depending on distance and need to add supplemental drilling equipment, such as skidding plates.
[2] 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 Clark #1 well/pad:

Facility	Number or Miles	Factor	Disturbance
Engineered Pad	1 (400 ft x 350 ft)	140,000 sq ft	3.214 acres
New access Road	278 ft	50 ft disturbance	0.32 acres
Proposed Overhead Power	95 ft	20 ft disturbance	.04
Total Surface Disturbance			**3.484 acres**

The reasonably foreseeable activity for this and adjacent analysis areas is that O'Brien expects to increase supporting infrastructure and explore for fluid minerals in the analysis area if this well produces.

2.3. Alternatives Considered but Eliminated from Detailed Analysis
BLM briefly considered proposing and analyzing an alternative access road but eliminated the concept when the Wyoming Game and Fish Department (WGFD) strongly preferred using the existing surface disturbance for reasons in their letter, (December 16, 2013); see AR.

2.4. 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 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 all of the PRB's coalbed natural gas (CBNG) wells and over 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). Yet, in this foreseeable activity and proposal analysis area the is essentially no material change since the 2003 analysis from the PRB FEIS. There are 7 old oil and gas wells and 22 plugged and abandoned oil and gas wells in the project area, Wyoming Oil and Gas Conservation Commission (WOGCC) 2013. 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. The State of Wyoming and BLM also approved wells that operators may develop in the near future. 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. 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

Wyoming's Department of Environmental Quality (WDEQ) regulates Wyoming's air quality with oversight from the U.S. Environmental Protection Agency (EPA). BLM incorporates by reference the August 2012 Lease Sale EA, WY-070-EA12-44, pp. 17-24 (air quality, greenhouse gas emissions, and visibility); and the 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 EPA established ozone standards in 2011 and oil and gas new source performance standards in 2012, 77 FR 49490. Existing air quality in the PRB is "unclassified/attainment" for 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 - 2013 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 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 carbon monoxide (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
- Sulfur dioxide (SO2) and NOx from power plants.

3.2. Soils, Ecological Sites, 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 6 inches to 12 inches plus. Erosion potential varies depending on the soil type, vegetative cover, and slope. Reclamation potential of soils also varies in 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, provide 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. Soils and landforms of this area may present distinct challenges for development, and/or eventual site reclamation. Dominant/Important Soils/Ecological sites in the affected area are loamy soils. The major ecological sites for the project are loamy. A small portion of the affected area is "unrated". See the NRCS Soil Survey Campbell County (SSURGO) data. The Ecological Site interpretations include additional site-specific soil information.

3.3. Ecological Sites and Vegetation

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.

3.4. Water Resources

WDEQ regulates Wyoming's water quality with EPA oversight. 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 WOGCC has authority for permitting and bonding off channel pits located over state and fee minerals.

3.4.1. Groundwater

The forseeable activity and proposal areas historical use of groundwater was for stock or domestic water. There are 7 oil and gas wells, 22 plugged and abandoned wells and 2 water injection wells (WIW) within one mile of the proposed location. A search of the WSEO Ground Water Rights Database showed 2 registered stock and domestic water wells within 1 mile of the proposed well(s) with depths from 195 to 370 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. In the PRB, the Fox Hills formation is the deepest fresh water aquifer which merits specific attention. In this area, the depth to the Fox Hills is 2,576 feet. 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.

3.4.2. Surface Water

The foreseeable activity and project areas are in the Upper Cottonwood Creek drainage which is tributary to the Little Powder River. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent. The channels are primarily well vegetated grassy swales, without defined bed and bank. See the PRB FEIS, pp. 3-48 to 3-49.

3.5. Wetlands/Riparian

The foreseeable activity and proposal areas surrounding the Clark #1 well have isolated areas of impounded water. However, the project will not impact any impoundment or associated riparian areas.

3.6. Invasive or Noxious Species

The operator 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 in the foreseeable activity and proposal areas. 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.

3.7. 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 foreseeable activity and project area on March 14, 2013. In addition Wildlife Resources (WR) performed surveys for bald eagles, prairie dogs, sage-grouse, sharp-tailed grouse, and raptors during the 2013 survey period (WR 2013a). 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.

3.7.1. Threatened, Endangered, Candidate, Special Status (Sensitive) Species

The Buffalo BLM receives a species list periodically from the FWS concerning threatened, endangered, proposed, and candidate species. The 2012 list included Ute Ladies'-tresses orchid (threatened) and Greater Sage-Grouse (GSG) (candidate). In addition to the listed species, the FWS letter also included migratory birds and wetland/riparian habitats. In October 2013, the Northern long-eared myotis (*Myotis septentrionalis*) was proposed for listing under the ESA.

3.7.1.1. Candidate Species - 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 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 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.

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 show that 2 occupied GSG leks occur within 4 miles of the project area. These leks are in Table 3.1, below. One unoccupied lek is also present within 4 miles, the Gerard lek. There are currently 149 wells (Wyoming Oil and Gas Conservation Commission [WOGCC] (November 26, 2012)) within the cumulative impact assessment area, an area of 84.5 square miles, which is a density of approximately 1.8 wells per square mile. The Clark #1 is the only proposed well within 4 miles of the 2 leks. With the addition of the proposed wells, the well density within 4 miles of the leks does not substantially change, and remains at approximately twice the one well per square mile recommendation by the State Wildlife Agencies' Ad Hoc Committee for Sage-Grouse and Oil and Gas Development.
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 WGFD-defined category of impact for these 2 identified leks is provided in Table 3.1.

Table 3.1. WGFD Category of Impact for Greater Sage-Grouse Leks in the Project Area

Lek Name[1]	Distance to Project (miles)	Number of Permitted and Producing Wells[1]		Density of Permitted Producing Wells (wells per square mile)		WGFD Category of Impact
		2-mile buffer	*4-mile buffer*	*2-mile buffer*	*4-mile buffer*	
Deer Creek	0.7	31	100	2.46	1.99	High
Preston Draw	3.8	7	75	0.56	1.49	Low

[1] Lek locations obtained from WGFD 2013b. The locations of permitted and producing oil and gas wells were obtained from the WOGCC online database (WOGCC 2013).

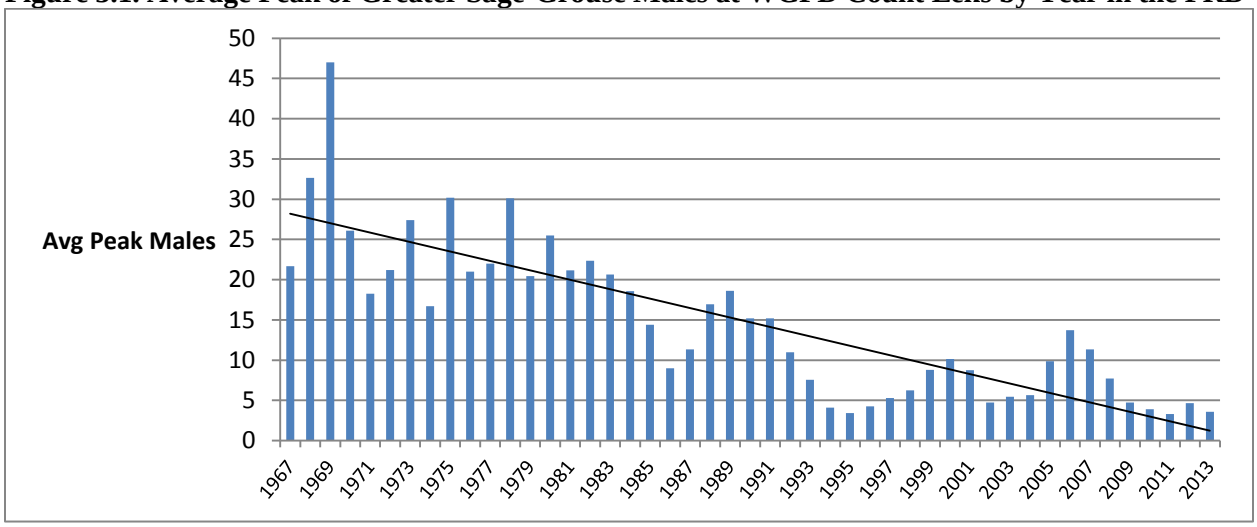
The GSG population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2013b). Figure 3.1 illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that the declines since 2001 are a result, in part, of energy development (FWS 2010, Taylor et. al. 2012).

Impacts from oil and gas development are discernible at the spatial scale of 20 km (12.4 mi) (Taylor et al. 2012). These findings echo results from previous studies conducted in the basin, wherein biologists observed basin-wide population declines (Walker et al. 2007). There are 18 documented leks within 12.4 miles of the Clark #1 project area; 2 are classified as unoccupied. Currently there are 3,449 existing and approved wells within 12.4 miles of the 18 leks, an area of 1,703 square miles.

Site Specific Habitat

The project area is not in a core or connectivity habitat area, as identified in EO 2011-5, Greater Sage-grouse Core Area Protection. Cores areas occur approximately 10 miles northwest and 8 miles southeast from the project area. GSG habitat models indicate that the project area contains high quality GSG nesting and winter habitat (Walker et al. 2007). BLM confirmed suitable nesting, brood rearing, and winter habitat is present throughout the Clark #1 project area. BLM also observed GSG sign during the onsites including roost piles, pellets, fecal deposits, and feathers. During the onsite, the BLM biologist requested a current survey for breeding sage-grouse be performed in the project area due to the large amount of sign observed in the area, and fairly concentrated approximately 0.25 miles from the proposed well site. WR performed the survey in April 2013, leading to the discovery of the Deer Creek lek approximately 0.7 miles from the proposed location. WR reported a group of 3 individuals in the ephemeral draw to the north of the proposed location (WR 2013b).

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



3.7.1.2. Special Status (Sensitive) Species (SSS)

The PRB FEIS discussed the affected environment for SSS, pp. 3-174 to 201. The authority for the SSS comes from the ESA, as amended; the FLPMA; Department Manual 235.1.1A and BLM Manual 6840. Table A.1, Appendix A lists those SSS that may occur in the project area. The Table also includes a brief description of the habitat requirements for each species.

3.7.2. Big Game

The big game species occurring in the project area are mule deer and pronghorn. Sign of both species was observed by the biologist during the onsite. The PRB FEIS discussed the affected environment for pronghorn, mule deer, white-tailed deer, and elk on pp. 3-117 to 3-122 and pp. 3-127 to 3-132. Table 3.2 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 2013a).

Table 3.2. Big Game Species, Seasonal Ranges, Herd Units, Population Objectives, and Population Estimates for Big Game Species Likely to Occur in the Clark #1 Project Area

Species	Seasonal Range in Project Area	Herd Unit	WGFD Population Objective	% Above (+) or Below (-) Objective	WGFD Report Year
Mule Deer	Yearlong	319 – Powder River	52,000	- 32.1%	2013
Pronghorn	Winter yearlong	339 – North Black Hills	14,000	- 10.6%	2013

3.7.3. Raptors

The PRB FEIS discussed the affected environment for raptors, pp. 3-141 to 3-148. According to the BLM raptor database, there are no known nests located within 0.5 miles of the proposed Clark #1 well. No new nests were documented in the project area after a thorough nest search (WR 2013a). 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 for raptors that typically use ground nests or prefer small cavities or crevices in erosional banks; species that would be suspected to nest near the project are American kestrel or short-eared owl. Several raptor species may forage in the area including golden eagle, northern harrier, Swainson's hawk, American kestrel, short-eared owl, great horned owl, red-tailed hawk, ferruginous hawk (SSS), and rough-legged hawk (winter resident).

3.7.4. 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 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. Recent prosecutions or settlements in Wyoming, and the west, cost companies millions of dollars in fines and restitution (which was usually retrofitting power lines to discourage perching to minimize electrocution or shielding ponds holding toxic substances). 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 sage-brush steppe grasslands, mixed grass prairie, and mature deciduous trees. 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 occur in the project area are: Brewer's sparrow, sage thrasher, loggerhead shrike, short-eared owl, grasshopper sparrow, ferruginous hawk, and golden eagle. Of these, 4 species are identified on the BLM Wyoming Special Status (Sensitive) Species list.

The WGFD Wyoming Bird Conservation Plan (Nicholoff 2003) identified 3 groups of Wyoming's high-priority bird species: Level I – those that clearly need conservation action, Level II – species where the focus should be on monitoring, rather than active conservation, and Level III – species that are not of high priority but are of local interest. Species likely occurring in the project area are in Table 3.3.

Table 3.3. Migratory Birds Occurring in Shrub-steppe Habitat, NE Wyoming (Nicholoff 2003)

Level	Species	WY BLM Sensitive	Species	WY BLM Sensitive
Level I	Brewer's sparrow	Yes	Mountain Plover	Yes
	Ferruginous hawk	Yes	Sage sparrow	Yes
	McCown's longspur	No		
Level II	Grasshopper Sparrow	No	Loggerhead shrike	Yes
	Lark bunting	No	Sage thrasher	Yes
	Lark sparrow	No	Vesper sparrow	No
Level III	Common poorwill	No	Say's phoebe	No

Several migratory species are also BLM special status (sensitive) species (SSS). Those known or suspected of occurring in the project area include Baird's sparrow, Brewer's sparrow, ferruginous hawk, loggerhead shrike, sage sparrow, and sage thrasher. Most of the birds listed in **Error! Reference source not found.** typically nest either on the ground or in shrubs. During the March 14, 2013 on-site, the BLM identified suitable nesting habitat for sagebrush obligate passerines at the proposed Clark #1 well pad location.

3.8. Cultural Resources

In accordance with 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 that 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. 70130053) was performed to locate specific historic properties which may be impacted by the proposal. No Cultural resources are in the proposal area.

4. ENVIRONMENTAL EFFECTS

No Action Alternative. BLM analyzed the no action alternative as Alternative 3 in the PRB FEIS and it subsequently provided a field onsite inspection that validated the area is materially little changed since the 2003 analysis. This updated the no action alternative and cumulative effects. The foreseeable activity and project areas have about 5-15 acres of surface disturbance from existing roads, well pads, and oil and gas facilities. Under the no action alternative, on-going well field operations would continue as would the development of any approved single and multi-well pads (approximately 10 acres of new disturbance). The production and the drilling and completion of any new wells would result in noise and human presence that could affect resources in the foreseeable activity and project area; these effects could include the disruption of wildlife, the dispersal of noxious and invasive weed species, and dust effects from traffic on unpaved roads. 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

Proposed and existing, pads, roads, and culverts are shown on the MSUP and maps (see the APD). These structures would be built per sound engineering practices and BLM standards.

BLM defined the designation of the duration of disturbance in the PRB FEIS (pp. 4-1 and 4-151). “For this EIS, short-term effects are defined as occurring during the construction and drilling/completion phases. Long-term effects are caused by construction and operations that would remain longer”. The effects to soils and vegetation, resulting from proposed access road, well pad construction and existing access roads that require improvements include:

-Mixing of horizons – occurs where construction on roads or other activities take place. Mixing may result in removal or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Soils which are more susceptible to wind and water erosion may be moved to the surface. Soil structure may be destroyed, which may impact infiltration rates. Less desirable inorganic compounds such as carbonates, salts, or weathered materials may be relocated and have a negative impact on re-

vegetation. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
-Loss of soil vegetation cover, biologic crusts, organic matter and productivity. With expedient reclamation, productivity and stability should be regained in the shortest time frame.
-Soil erosion would also affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography and cover.
-Soil compaction – the collapse of soil pores results in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction may be remediated by plowing or ripping.
-Modification of hill slope hydrology - 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 predominantly composed of cyanobacteria, green and brown algae, mosses and lichens. They are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (BLM 2003). They are adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily disturbed or destroyed by surface disturbances associated with construction activities.

These impacts, singly or cumulatively, would increase the potential for soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system. Direct effects (removal and/or compaction) to vegetation would occur from ground disturbance caused by drilling rig equipment and construction of a well pads, tank batteries 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 may result in loss of vegetation and affect reclamation success for the life of the project.

4.2.1. Cumulative Effects

For details on expected cumulative impacts, refer to the PRB FEIS, pp. 4-151. 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. These impacts, singly or in combination, could increase the potential for valuable soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system, if applicable mitigation measures are not used.

4.2.2. Mitigation Measures

O'Brien and BLM should apply the following mitigation to reduce impacts to soils and vegetation from surface disturbance. Culverts will be at the appropriate locations for streams and channels crossed by roads specified in the BLM Manual 9112, Bridges and Major Culverts and Manual 9113, Roads. Streams will be perpendicular to flow, where possible, and all design of stream crossing structures will carry the 25-year discharge event or other capacities as directed by the BLM.

4.2.3. Residual Effects

Residual effects across the project 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 with is within the parameters for surface disturbance and surface disturbance reclamation in PRB FEIS ROD.

4.3. Ecological Sites and Vegetation

4.3.2. 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.

4.3.3. 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.

4.3.4. Mitigation Measures

Implementation of the mitigation measures in the COAs, the projects POD, 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.

4.3.5. Residual Effects

Residual effects were also 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 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 soils with little or no re-vegetation success. The BLM considers these residual effects from Alternative B with proposed well are likely within the parameters for acceptable surface disturbance and surface disturbance reclamation in PRB FEIS ROD and Onshore Order Number 1.

4.4. Water Resources

O'Brien's drilling program provides additional protection for the Fox Hill formation. The casing design and cement program includes centralizers on every joint of casing to facilitate adequate cement covering. The volume of cement pumped is calculated to provide cement across the Fox Hill from 100 feet above to 100 feet below the aquifer. 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. The operator will set surface casing at 650 feet to provide additional protection for shallow groundwater aquifers and coal zones. 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.

O'Brien 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, O'Brien 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.

4.5. Wetland/Riparian

Watershed values, including natural drainages, would not be unduly impacted by the foreseeable activity or the proposal with properly applied mitigation. Other water resources will not be adversely impacted by the proposal. Possible contamination effects of fresh water aquifers will be reduced through the use of tested casing, by setting casing at appropriate depths and by following safe repair procedures in the event of casing failure. Other downhole well operations are expected to cause minimal impacts using standard engineering practices. 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. For more information on cumulative impacts, refer to the PRB FEIS.

4.6. Invasive Species

4.6.1. 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 associated with construction of proposed access roads, pipelines, and forseeable activities would present opportunities for weed invasion and spread. The foreseeable activities and those related to the performance of this proposal 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.

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 such high densities and numerous locations throughout 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.

4.6.2. Cumulative Effects

Activities related to the development of the proposed project would create a favorable environment for the spread of noxious weeds/invasive plants, if control measures are inadequate.

4.6.3. Mitigation Measures

See 4.6.1 above.

4.6.4. Residual Effects

Control efforts by the operator are limited to the disturbance associated with the project. Cheatgrass and /or downy brome and to a lesser extent, Japanese brome exist in the affected environment. These species

are 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.

4.7. Fish and Wildlife

4.7.1. Wildlife Threatened, Endangered, Proposed and Candidate Species

4.7.1.1. Threatened and Endangered Species

Based on the last species list for the Buffalo Field Office, dated July 22, 2011, the Ute Ladies'-tresses Orchid (ULT) is the only listed species requiring an effects determination (ESA Section 7 (2)). Suitable habitat for ULT is not present in the foreseeable activity and project area, and implementation of the proposed project will have "no effect" on ULT. Suitable roosting habitat for Northern long-eared bat (proposed for listing) is not present in the project area, and individuals are not expected to forage in the project area based on typical home range sizes and foraging characteristics. Implementation of the proposed project will have "No effect" on the species

4.7.1.2. Candidate Species – Greater Sage-Grouse (GSG)

4.7.1.2.1. Direct and Indirect Effects

Implementation of the proposed project 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).

The Clark #1 project area contains suitable nesting, brood-rearing, and winter habitat. Construction of the well pad and road improvements will cause fragmentation of sagebrush stands and result in the direct loss of 6 acres of GSG habitat. Noise and human disturbance associated with roads, construction, drilling, and completion will be disruptive to GSG. O'Brien describes activities that will occur during drilling and completion of proposed wells in its Surface Use Plan of Operations (SUPO) for the Clark #1 well. O'Brien estimates that drilling will last approximately 4 weeks, with completion beginning within a week afterward. It's estimated that 60 semi-loads will be required for move in and out of the drilling rig, as well as 2 semi-loads per week during the drilling process. They also estimate 6 semi-loads in and out during completion operations (SUPO, p. 2). Completion, including staging and stimulation activities, may last up to a week based on estimates given in previously approved projects within the BFO. 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.

The main access road into the project area occurs within approximately 600 feet (0.1 miles) of the Deer Creek Lek, well within the 0.25 miles CSU included in the RMP for occupied or undetermined leks. Currently, the road is the main access to 3 fee and 5 federal producing oil wells, as well as 2 water injection wells. Construction of a new road outside the CSU was not considered because of the existing development in the area currently utilizing the road and topography in the area making siting of a new road difficult without destroying additional habitat. The BLM requested recommendations from the WGFD in regards to use of the existing road. In their letter of December 16, 2013, the WGFD wrote that building a new road through suitable nesting habitat is likely to be more detrimental to GSG in the area than using the existing road given the operator's commitments to reduce traffic on the road during the breeding season. (WGFD 2013c). WGFD also recommended timing limitations on construction during the breeding/nesting season (March 15 – June 30) within 2 miles of the Deer Creek Lek.

Continued use of the access road may cause GSG to abandon the Deer Creek Lek due to traffic during the breeding and nesting season; approval of the Clark #1 would increase traffic on the road. Noise from the

use of the access road is likely to disrupt breeding behavior of GSG using the lek by interfering with the ability to hear vocalizations, increasing stress to individuals, and causing changes in strutting patterns and avoidance of the lek (Patricelli et al. 2012, Blickley et al. 2012, Blickley and Patricelli 2012). 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) has been 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. O'Brien has committed to only travel the road from the hours of 8 a.m. to 6 p.m. during the breeding season (March 15 – May 15). This timing limitation will alleviate impacts to grouse attending leks, but will not reduce impacts to grouse that may be nesting or roosting near roads in the project area. Even with a timing limitation on travel near the lek during the breeding season, GSG may avoid the Deer Creek Lek and surrounding nesting habitat, and eventually abandon the area due to existing traffic in the area.

Research has identified reductions in road and well pad construction, vehicle traffic, and 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) within 2 miles of all occupied leks. It is BLM WY policy to manage GSG habitats consistent with the provisions set by the State of Wyoming, and as described in 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 outside of core and connectivity habitats, "Surface disturbing and/or disruptive activities are prohibited from March 15–June 30 to protect sage-grouse nesting and early brood rearing habitats within 2 miles of the lek or lek perimeter of any occupied lek located outside core or connectivity areas." Allowing disruptive activities (such as those associated with well completion) to occur during the breeding/nesting season (March 15 – June 30) does not support the WY BLM policy.

Allowing disruptive activities (such as those associated with well completion) to occur during the breeding/nesting season (March 15 – June 30) is not 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). In order to be in compliance with EO 2011-5, "a 2 mile seasonal buffer should be applied to occupied leks." The intent of EO 2011-5 management in non-core areas is to maintain populations and habitats where possible.

4.7.1.2.2. Cumulative Effects

The PRB FEIS (BLM 2003) states that "the synergistic effect of several impacts would likely result in a downward trend for the 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 (pg. 4-270)." Based on the impacts described in the PRB FEIS and the findings of more recent research, the proposed action may contribute to a decline in male attendance at the 2 leks that occur within four miles of the project area, and, potentially, extirpation of the local grouse population. Authorization of disruptive activities (such as completion activities) within 2 miles of an occupied lek during the breeding/nesting season, is inconsistent with the WY BLM and State of Wyoming GSG policies, and would set a precedent that these policies do not require compliance outside of GSG priority habitats.

Surface-disturbing and other disruptive activities that occur on non-BLM-administered lands are not subject to the restrictions designed to protect wildlife habitat on BLM-administered lands and therefore may increase the cumulative impacts on wildlife habitat. Increased development (roads, power lines, minerals, residential) on state and private lands and the spread of invasive species on private and state lands throughout the planning area may contribute to a reduction of suitable habitat through degradation, removal, and fragmentation of habitat.

In its Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (2009), WGFD categorized levels of oil and gas development into thresholds that correspond to moderate, high, and extreme impacts to habitat effectiveness for various species of wildlife, based on well pad densities and acreages of disturbance. All 3 levels of impact result in a loss of habitat function by directly eliminating habitat; disrupting wildlife access to, or use of habitat; or causing avoidance and stress to wildlife. Extreme impacts mean those where the function of an important wildlife habitat is substantially impaired or lost.

The foreseeable activity and proposed project are within 2 miles of a GSG lek. This lek has about 2.5 wells per square mile within 2 miles of the lek; therefore experiencing high impacts according to the WGFD recommendations. Implementation of this proposal will not alter this categorization.

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..

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 two-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.

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 GSG 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).

4.7.1.2.3. Mitigation Measures

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. In order to reduce the likelihood that noise, construction, and human disturbance impact nesting GSG, BLM will implement a timing limitation on all surface-disturbing and disruptive activities within GSG habitat during the construction, drilling, and completion phases of the Clark #1 well and access road. 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. The BLM will also implement a limitation on noise levels at the edge of occupied leks in the project area.

4.7.1.2.4. Residual Effects

A timing limitation restricting surface disturbance and disruptive activities during the development phase 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 BLM made a commitment to support the management objectives set by the State of Wyoming, to maintain populations and habitats. In addition, the BFO identified the following objectives in the current RMP: maintain a biological diversity of animal species, support the WGFD population objectives, maintain or improve quality of wildlife habitat, and provide habitat for special status habitat species (BLM 2001).

The RMP identified that these goals would be achieved by implementing species specific stipulations, including the 0.25 mile controlled surface use (CSU) around GSG leks. While current WY policies direct the BLM to work to eliminate any new surface occupancy within the CSU, the access road for the project is an existing, well-traveled improved road, and does not constitute new surface occupancy. The impacts to the Deer Creek Lek from traffic for the Clark #1 well will be mitigated with a timing limitation during the breeding season.

The PRB FEIS predicted that the PRB oil and gas development would have significant impacts to the GSG population. The impact of the foreseeable activity or the Clark #1 development cumulatively contributes to the potential for local GSG extirpation. Alternative B and the COAs applied are consistent with current BLM and Wyoming GSG conservation strategies and the anticipated effects are within the parameters of the PRB FEIS/ROD.

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.

4.7.1.3. Special Status (Sensitive) Species (SSS)

Sensitive sage-brush obligate birds are addressed in the migratory bird section below. The PRB FEIS discusses impacts to SSS, pp. 4-257 to 4-265. The effects to SSS resulting from implementation of the foreseeable activity or the project are in Table 1 in Appendix B.

4.7.2. Big Game

4.7.2.1. Direct and Indirect Effects

The BLM analyzed the direct, indirect, and cumulative effects to big game in the PRB FEIS, pp. 4-181 to 4-211. Yearlong range for mule deer and winter yearlong range for pronghorn antelope would be directly disturbed with the Clark #1 well and access road. Long term disturbance would be direct habitat loss. Short-term disturbances also result in direct habitat loss; however, they should provide some habitat value as these areas are reclaimed and native vegetation becomes established.

In addition to the direct habitat loss, big game would likely be displaced from the project area during drilling and construction. A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). The WGFD indicates a well density of 8 wells per section creates a high level of impact for big game and that avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004). A multi-year study on the Pinedale Anticline suggests not only do mule deer avoid mineral activities, but after 3 years of drilling activity the deer have not become accustomed to the disturbance (Madson 2005, Sawyer et al. 2006).

Big game animals are expected to return to the project area following construction; however, populations will likely be lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and, as the Pinedale Anticline study suggests, mule deer do not readily habituate. A study in North Dakota stated, “although the population (mule deer) had over 7 years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic” (Lustig 2003). Mule deer have been shown to avoid all types of well pads but tended to select areas farther from well pads associated with higher levels of traffic (Sawyer et al. 2009). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

Winter big game diets are sub-maintenance, meaning they lose weight and body condition as the winter progresses. Survival below the maintenance level requires behavior that emphasizes energy conservation. Canfield et al. (1999) pointed out that forced activity caused by human disturbance exacts an energetic disadvantage, while inactivity provides an energetic advantage for animals. Geist (1978) further defined effects of human disturbance in terms of increased metabolism, which could result in illness, decreased reproduction, and even death.

Energy development activities that occur within big game habitats during the spring will likely displace adult females and juveniles due to the human presence in the area. This may cause reduced survival rate of individuals that must expend increased energies to avoid such activities.

4.7.2.2. 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. 4-181 to 4-215.

4.7.2.3. Mitigation Measures

No mitigation is proposed with Alternative B.

4.7.2.4. Residual Effects

No residual impacts are anticipated.

4.7.3. Migratory Birds

4.7.3.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to migratory birds on pp. 4-231 to 4-235. The PRB FEIS reads on p. 4-231, "Surface disturbance associated with construction, operation, and abandonment of facilities, including roads, has the potential to result in direct mortality of migratory birds. Most birds would be able to avoid construction equipment; however, nests in locations subject to disturbance would be lost, as would any eggs or nestlings." Direct mortality of a bird or destruction of an active nest due to construction activities could result in a "take" as defined (and prohibited) by the MBTA, a nondiscretionary statute, and in turn a violation of the law. See also, FLPMA, Sec. 302(b).

Habitat disturbance and disruptive activities (i.e. drilling, construction, completion, operations, and maintenance) resulting from implementation of the project is likely to affect migratory birds in the entire area. Native habitats will be lost directly with the construction of well pads, access roads, and overhead power lines. 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, will displace edge-sensitive migratory birds from otherwise suitable habitat adjacent to the well pad. Drilling and construction noise can be troublesome for songbirds by interfering with the males' ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003). Habitat fragmentation will result in more than just a quantitative loss in the total area of habitat available; the remaining habitat area will also be qualitatively altered (Temple and Wilcox 1986). Ingelfinger and Anderson (2004) identified that the density of breeding Brewer's sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 meters of dirt roads in a natural gas field. Effects occurred along roads with light traffic volume (less than 12 vehicles per day). The increasing density of roads constructed in developing natural gas fields exacerbated the problem creating substantial areas of impact where indirect habitat losses through displacement were much greater than the direct physical habitat losses.

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

During the onsites, the BLM biologist identified suitable nesting habitat present for several BLM sensitive sagebrush obligates (Brewer's sparrow, loggerhead shrike, sage thrasher). Construction of the Clark #1 well and access road will remove nesting habitat and could cause direct mortality to BLM sensitive migratory birds, or destroy eggs.

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 and disruptive activities associated the Clark #1 well will have GSG timing limitations applied, thereby providing protection to migratory birds until June 30.

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). To minimize these effects, all open vent stack equipment will be designed and constructed to prevent entry by birds and bats, and to discourage nesting or perching (SUPO, p. 4).

4.7.3.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, p. 4-235.

4.7.3.3. Mitigation Measures

GSG timing limitations on surface disturbing and disruptive activities will also serve to mitigate impacts to nesting migratory birds. Raptor protections are put in place to avoid potential violations of the MBTA, making the guidance for seasonal timing relevant to the migratory bird issue as well. Specific conservation measures to protect migratory birds are not included in the current land use plan, as updated and amended. Although the PRB FEIS ROD addressed the potential impacts from oil and gas development to migratory birds, it did not specifically identify activities to help mitigate those impacts. The RMP is currently under revision, and a change in management for migratory birds is being considered among the alternatives. Until the revision is complete, the BFO will provide project level site-specific analysis of conservation measures implemented for migratory bird protection, and compliance with the MBTA.

BLM provided some level of protection for migratory bird nesting through timing limitations applied to CBNG plans of development for GSG and raptor nesting. Many CBNG projects (consisting of multiple wells) covered large areas that either encompassed GSG nesting habitat or raptor nests. Timing limitations applied as COAs for those projects were likely to also protect migratory birds during the nesting season by effectively limiting the development in a project area during grouse and raptor breeding seasons. Operators were likely to wait to construct facilities until limitations had been lifted for the entire area, in order to cut down on labor costs and difficulties from completing only small portions of the project at a time. With conventional oil projects, where less wells are proposed and development is more complicated, operators will most likely start construction as soon as possible, which could be during the migratory bird nesting season if the proposed area is not within 2 miles of a GSG lek or no active raptor nests are located. The shift in proposed projects from multi-well CBNG projects to single conventional wells, and in turn reducing secondary protections to migratory birds, constitutes a “change in circumstances” (43 CFR 1610.5-6) that should be addressed at the project level until issues can be resolved in a land use plan.

Nesting in Brewer’s sparrows (a BLM SSS) typically occurs mid-May to mid-July. Some young fledge in late July. Sage thrashers (BLM sensitive species) may lay a second clutch of eggs as late as mid-July. Lark sparrows in northern latitudes lay eggs from early May to mid-July (information on breeding habits available on the Birds of North America Online website: http://bna.birds.cornell.edu/bna). GSG timing limitations on surface disturbing activities will mitigate impacts to nesting migratory birds from March 15

to June 30. However, several species of birds are likely to still have eggs or nestlings into July. BLM biologists have observed active Brewer's sparrow nests containing eggs during the last week of June. The least restrictive measures (in this case only applying GSG timing limitations) are inadequate to protect nesting migratory birds that may inhabit the project area.

To reduce the likelihood of a "take" under the MBTA, the BLM biologist recommends that pad and access road construction (vegetation removal) occur outside of the breeding season for the greatest quantity of BLM sensitive passerines (May 1- July 31) where suitable nesting habitat for sagebrush obligates is present. This restriction would apply to habitat removal, unless a pre-construction nest search (within approximately 10 days of construction planned May 1-July 31) is completed. If surveys will be conducted, the operator will coordinate with BLM biologists to determine protocol. The nest search will consist of areas where vegetation will be removed or destroyed. The BLM recommends the Clark #1 well pad and associated infrastructure have timing limitations applied for habitat removal during the nesting season for sagebrush obligate passerines (May 1 to July 31).

The BLM recommends that measures are taken to ensure that migratory birds are excluded from all facilities that pose a mortality risk, including, but not limited to, heater treaters, flare stacks, secondary containment, and standing water or chemicals where escape may be difficult or hydrocarbons or toxic substances are present.

4.7.3.4. Residual Effects

If restrictions on habitat removal, or clearance surveys, are not applied, the BLM would not be in conformance with the MBTA, the BLM-FWS MOU, or BLM IM No. 2013-005. If the restriction on habitat removal is applied, it is unlikely that active nests will be destroyed, as most nestlings will have fledged by August 1. 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.

4.7.4. Raptors

4.7.4.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to raptors, pp. 4-216 to 4-221. There are no known raptor nests within 0.5 miles of the Clark #1 well. Alteration of habitat, in addition to surface disturbing and disruptive activities associated with implementation of the project, may negatively impact foraging raptors and discourage establishment of new nests.

4.7.4.2. Cumulative Effects

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

4.7.4.3. Mitigation Measures

No mitigation is proposed with Alternative B.

4.7.4.4. Residual Impacts

No residual impacts are anticipated.

4.8. Cultural Resources

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 July 18, 2013 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 and ROD must be followed. Further discovery procedures are explained in Standard COA (General)(A)(1).

4.8.1. 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 foreseeable activity or 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 electronically notified the Wyoming State Historic Preservation Officer (SHPO) on September 30, 2013 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 and ROD must be followed. Further discovery procedures are explained in Standard COA (General)(A)(1).

4.8.2. 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. Also, 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 proposal 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.

4.8.3. 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.

4.8.4. 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.

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

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.	NP	NI	Habitat 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.	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body with reliable prey source nearby.	K	MIIH	Surface disturbing and maintenance activities may impact foraging eagles and the species may avoid the area.
Brewer's sparrow (*Spizella breweri*)	Sagebrush shrubland	S	MIIH	A timing limitation will protect active nests from destruction during the nesting season. 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	S	MIIH	No documented nests occur 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.
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	NP	NI	Habitat not present.
Mountain Plover	Short-grass prairie with slopes < 5%	NP	NI	Habitat not present.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NP	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Peregrine falcon (*Falco peregrinus*)	Cliffs	NP	NI	Habitat not present.
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub			A timing limitation will protect active nests from destruction during the nesting season. Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub			A timing limitation will protect active nests from destruction during the nesting season. 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	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
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 are documented in the project area.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	S	MIIH	Suitable roosting habitat not present. Foraging individuals may be impacted by dust, noise, human activities, or habitat loss. Mitigation excluding birds and bats from production facilities will reduce mortality risk.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	S	MIIH	Suitable roosting habitat not present. Foraging individuals may be impacted by dust, noise, human activities, or habitat loss. Mitigation excluding birds and bats from production facilities will reduce mortality risk.
Spotted Bat (*Euderma maculatum*)	Prominent rock features in extreme, low desert habitats to high elevation forests.	NP	NI	Habitat not present.
Swift fox (*Vulpes velox*)	Grasslands	NS	MIIH	Foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	S	MIIH	Suitable roosting habitat not present. Foraging individuals may be impacted by dust, noise, human activities, or habitat loss. Mitigation excluding birds and bats from production facilities will reduce mortality risk.
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