DECISION RECORD
DEP Energy Production Company, L.P., Jo, Plan of Development (POD)
Environmental Assessment (EA), WY-070-EA12-162
Bureau of Land Management, Buffalo Field Office, Wyoming

DECISION. The BLM approves Devon Energy Production Company, L.P., (DEP or operator) Jo POD as described in Alternative B of the EA, WY-070-EA12-162. This approval includes the wells' support facilities.

Compliance. This decision complies with:

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

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

Well Site. BLM approves the following APDs and support facilities:

#	Well & Pad #	Qrt/Qtr	Sec	Twp	Rng	Lease #
1	Pad#1, Barlow Ranch 2195-2PH	NWSW	22	49N	75W	WYW173728; WYW147304
2	Pad#1, Barlow Ranch 2295-1PH	NWSW	22	49N	75W	WYW173728; (Bottom Hole Location) BHL FEE
3	Pad#1, Barlow Ranch 2295-2PH	NWSW	22	49N	75W	WYW173728
4	Pad #2, Barlow Ranch 2795-1PH	NESE	28	49N	75W	WYW147304; WYW173728
5	Pad #2, Barlow Ranch 2795-2PH	NESE	28	49N	75W	WYW147304; WYW174728
6	Pad #3, Barlow Ranch 3495-2PH	NESE	34	49N	75W	WYW147308; BHL FEE
7	Pad #3, Barlow Ranch 3595-1PH	NESE	34	49N	75W	WYW147308
8	Pad #3, Barlow Ranch 3595-2PH	NESE	34	49N	75W	WYW147308; WYW147298

Limitations: The unit POD does not include Barlow Ranch 2895-2PH APD and well which is not approved at this time, by the express request of DEP in their March 30, 2012 letter, p. 2.

THE FINDING OF NO SIGNIFICANT IMPACT (FONSI). Analysis of Alternative B of the EA, WY-070-EA12-162**,** and the FONSI, both incorporated here by reference, found DEP's proposal for Jo POD will have no significant impacts on the human environment, beyond those described in the PRB FEIS. BLM incorporates by reference Mallard POD EA (WY-070-EA07-078), South Prong Unit 1&2 POD (WY-070-08-142), and Labrador POD (WY-070-EA11-289) which also found no significant impacts to the environment. There is no requirement for an EIS.

This Project Tiers to the Following NEPA Documents, in Addition to the PRB FEIS.

POD Name	NEPA Document	Well #	Approval
Mallard	WY-070-EA07-078	50	3/12/2007
South Prong Unit 1&2 and Laskie Draw	WY-070-08-142	183	7/25/2008
Labrador	WY-070-EA11-289	9	9/8/2011

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

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

1. BLM and DEP included mitigation measures to reduce environmental impacts while meeting the project's need. For a complete description of all site-specific COAs see the COAs. The PRB FEIS analyzed and predicted that the PRB oil and gas development would have significant impacts to the region's Greater Sage-Grouse (GSG) population. The impact of this development cumulatively contributes to the potential for local extirpation yet its effect is acceptable because it is outside priority habitats and is within the parameters of the PRB FEIS and ROD and current BLM and Wyoming GSG conservation strategies.
2. DEP will conduct operations to minimize adverse effects to surface and subsurface resources, prevent unnecessary surface disturbance, conform to currently available technology and practice, and to resolve the issue regarding APD Barlow Ranch 2895-2H.
3. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.
4. The operator committed to:
   Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
   Obtain necessary permits from agencies.
   Offer water well agreements to the owners of record for permitted wells.
   Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.
5. The operator certified it has a surface access agreement or posted a 43 CFR 3814.1 bond.
6. The project clearly lacks wilderness characteristics as there is no federally owned surface.

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.

Acting Field Manager: _____ Date: 7/27/12

FINDING OF NO SIGNIFICANT IMPACT
Devon Energy Production Company, L.P., Jo, Plan of Development (POD)
Environmental Assessment (EA), WY-070-EA12-162
Bureau of Land Management, Buffalo Field Office, Wyoming

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-WY-070-EA12-162, which BLM incorporates here reference; I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those addressed in the Buffalo Final Environmental Impact Statement (FEIS) 1985, and the Powder River Basin (PRB) FEIS, 2003, Mallard POD EA (WY-070-EA07-078), South Prong Unit 1&2 POD (WY-070-08-142), and Labrador POD (WY-070-EA11-289) 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 land use in the PRB, sourcing over 42% of the nation's coal. The PRB FEIS reasonably foreseeable development analyzed the development of 54,200 wells. The additional development described in Alternative B is insignificant in the national 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 contribute to the PRB sage-grouse decline, having cumulative significant impacts; yet the small size of this project is within the parameters of the impacts in the PRB FEIS, State of Wyoming Sage-grouse Executive Order Wyoming (EO 2011-5) and BM Instruction Memorandum (WY-2012-19). 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 there is no federally owned surface. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. Alternative B 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.

Acting Field Manager: _____ Date: 7/27/12

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA12-162
Devon Energy Production Company, L.P., Jo Plan of Development (POD)
Bureau of Land Management, Buffalo Field Office, Wyoming

1. INTRODUCTION

This EA analyzes 9 applications for permit to drill (APDs) conventional, horizontal oil and natural gas wells and supporting infrastructure proposed by Devon Energy Production Company, L.P. (DEP or operator) at their Jo POD. BLM analyzes the NOSs/APDs to provide cumulative effects analysis on the reasonably foreseeable development and to establish a background analysis. This site-specific analysis tiers to and incorporates by reference the information and analysis in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS), WY-070-02-065, the PRB FEIS Record of Decision (ROD), Mallard POD EA (WY-070-EA07-078), South Prong Unit 1&2 POD (WY-070-08-142), and Labrador POD (WY-070-EA11-289) pursuant to 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on our website. The APDs are pursuant to the Mineral Leasing Act for the purpose of developing oil or gas using standard split estate jurisdiction rules of "federal lands" with fee surface over federal minerals.

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

1.1. Background

DEP submitted the Jo POD on May 23, 2011 to the BFO with 9 notices of staking (NOSs) to develop and produce oil and gas from formations of the PRB. DEP submitted 9 APDs on December 29, 2011. BLM conducted onsite visits in 2011 on August 8, October 24, and February 1, 2012 to evaluate the proposal and modify as necessary to alleviate environmental impacts. BLM sent a post-onsite deficiency on February 21, 2012. On April 3, 2012 DEP submitted deficiencies for the Jo POD. DEP's letter of March 30, 2012 reads that the operator "will defer approval of the Barlow Ranch 2895-2PH well until it can be spaced accordingly with the WOGCC" (Wyoming Oil and Gas Conservation Commission). This was not a withdrawal of the APD. So the APD received the BLM's full EA analysis as if DEP's deficiency with WOGCC may receive imminent resolution. Since DEP's deficiency with WOGCC over APD Barlow Ranch 2895-2PH remains unresolved and the APD is pending, BLM removed the APD from the Jo POD after completing the analysis as DEP and BLM initially proposed the POD. BLM shared the proposed conditions of approval (COAs) with the operator on July 24, 2012.

1.2. Need for the Proposed Project

The need for this project is to determine whether, how, and under what conditions to support the Buffalo Resource Management Plan's (RMP) goals, objectives, and management actions (2003 Amendment) with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. APD information is an integral part of this EA, which BLM incorporates here by reference (CFR 1502.21). Conditional fluid mineral development supports the RMP and the Mineral Leasing Act of 1920, the Federal Land Policy Management Act (FLPMA), and other laws and regulations.

1.3. Decision to be Made

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

1.4. Scoping and Issues

BFO external scoping included a 30 day posting of proposed APDs and the EA's timely publication on the BFO website. Previously BFO conducted extensive external scoping for the PRB FEIS - discussed on p. 2-1 of the PRB FEIS and on p. 15 of the PRB ROD. This project is similar in scope to other fluid mineral development the BFO analyzed. External scoping is unlikely to identify new issues, as verified with recent fluid mineral EAs BLM recently externally scoped. External scoping of the horizontal drilling in Samson Resources EA, WY-060-EA11-181, 2011, in the PRB area received 2 comments, revealing no new issues. External scoping in 2010 and 2011 for a proposed RMP amendment revealed no new issues outside of geographically-specific ones.

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

- Soils and vegetation: site stability, riparian and wetland communities, invasive species
- Wildlife: raptor productivity, migratory birds, special status species
- Cultural: National Register of Historic Places eligible sites
- Visual resources

2. PROPOSED PROJECT AND ALTERNATIVES

2.1. Alternative A – No Action

The PRB FEIS considered a No Action Alternative, pp. 2-54 to 2-62. This alternative must also consider and aggregate the effects analyzed in the PRB FEIS analysis with incorporating by reference the subsequent analysis and development from the adjacent and intermingled projects, see Table 2.1). The total number of conventional wells approved by BFO is 359, which includes 193 horizontal wells (as of March 2012). The WOGCC permitted 103 wells. The total is 453, which represents 14% of the projected 3,200 in the 2003 PRB ROD. (See Tables 2.3 and 2.5 for an approximation of the disturbance in the current situation.) This agrees with the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of over 51,000 coal bed natural gas (CBNG) and 3,200 natural gas and oil wells. The no action alternative would consist of no new federal wells. This alternative would deny these APDs and /or POD requiring the operator to resubmit APDs or a POD that complies with statutes and the reasonable measures in the PRB RMP Record of Decision (ROD) in order to lawfully exercise conditional lease rights. This alternative could, through secretarial discretion suspend the senior leasehold, or could administratively cancel or withdraw the lease if improperly awarded, or seek to cancel the lease. It is not possible in the abstract to identify every interest and that is beyond the scope here.

Table 2.1. This Project Tiers to the Following NEPA Documents, in Addition to the PRB FEIS.

POD Name	NEPA Document	Well #	Approval
Mallard	WY-070-EA07-078	50	3/12/2007
South Prong Unit 1&2 and Laskie Draw	WY-070-08-142	183	7/25/2008
Labrador	WY-070-EA11-289	9	9/8/2011

2.2. Alternative B Proposed Action

Operator/Applicant: Devon Energy Production Company L.P. (DEP)
Project Name: Jo POD (summarized at Table 2.2, below)

Table 2.2. Proposed Well Name/#/Lease/Location.

#	Well & Pad #	Qrt/Qtr	Sec	Twp	Rng	Lease #
1	Pad#1, Barlow Ranch 2195-2PH	NWSW	22	49N	75W	WYW173728; WYW147304
2	Pad#1, Barlow Ranch 2295-1PH	NWSW	22	49N	75W	WYW173728; (Bottom Hole Location) BHL FEE
3	Pad#1, Barlow Ranch 2295-2PH	NWSW	22	49N	75W	WYW173728
4	Pad #2, Barlow Ranch 2795-1PH	NESE	28	49N	75W	WYW147304; WYW173728
5	Pad #2, Barlow Ranch 2795-2PH	NESE	28	49N	75W	WYW147304; WYW174728
6	Pad #2, Barlow Ranch 2895-2PH	NESE	28	49N	75W	WYW147304; 13596 (BHL)
7	Pad #3, Barlow Ranch 3495-2PH	NESE	34	49N	75W	WYW147308; BHL FEE
8	Pad #3, Barlow Ranch 3595-1PH	NESE	34	49N	75W	WYW147308
9	Pad #3, Barlow Ranch 3595-2PH	NESE	34	49N	75W	WYW147308; WYW147298

Surface Owners: The proposed project initially disturbs an area of approximately 56.31 acres. All acres are 100% private and owned by Barlow Ranch Limited Partnership. The area clearly lacks wilderness characteristics because there is no federal surface.

County: Campbell

The Proposal involves:

Well Pads:
DEP proposes drilling and developing 9 horizontal oil and gas wells into federal mineral estate from 3 proposed well pads on fee surface. The primary objective is to drill to the Parkman Formation at 7,300 total vertical distance. For the surface hole locations and bottom hole locations see the administrative record. The drilling and construction of the well pads will result in approximately 29.37 acres of new surface disturbance. DEP will use approximately 2,390 feet of existing improved road and construct approximately 15,300 feet of new improved roads.

Surface disturbance will be minimized at each drill location. The drill pads will need to be leveled and cut-and-fill dirt work will be performed. The location will be fenced with 32 inch woven wire (sheep tight) and two strands of barb wire on top. The fence will encompass a larger area than is required to be disturbed in order to allow for the movement of equipment and people around the location.

The approximate size of disturbance required for the drilling pad including the topsoil and spoil piles ranges from 8.62 to 11.87 acres depending on the wells' location. The initial surface disturbance for all 3 pads is 29.37 acres. The interim surface disturbance for all 3 pads is 12.5 acres. All surface disturbance related to drilling will be confined to the drill sites.

Temporary lined mud (working) pits will be excavated at each well location (See Section 7, Jo POD, *Methods for Handling Waste* for pit specifications). The appropriate orientation of the temporary pit will control drill site layout (see well pad design sheets for Jo POD drilling pad layouts). Jo POD reserve pits will not be greater than 200 x 200 feet in dimension and 12 feet deep. The location will be completely fenced and livestock entry to the location will be restricted by a cattle guard. Each lined mud pit will contain drill cuttings and any water used, or encountered, during drilling operations. The pits will be designed to prevent the collection of surface runoff. An undisturbed vegetative border will be maintained between the location of the mud pit and the edge of adjacent drainages.

A box on box Mechanical/Electrical drilling rig will be used for drilling operations. A fresh water low solid non dispersed drilling fluid will be used in the mud system at each well.

Drilling, Construction and Production Design Features Include:

- DEP anticipates completing drilling and construction in 2 years. Drilling and construction is year-round in the region. Weather may cause delays but delays rarely last multiple weeks. Timing limitations in the form of COAs and/or agreements with surface owners may impose longer temporal restrictions.
- A road network consisting of 2,390 feet of existing improved roads and 15,300 feet of proposed improved roads.
- 5,695 feet of proposed above ground power line network and 43,575 feet of existing above ground power.
- Potential production facilities including 3 well heads, 3 pumping units, a tank battery containing up to 6 tanks placed on the cut portion of the location, circulating pump, a flare, a vapor recovery unit (VRC), a heater treater placed on the cut portion of the location, and possibly a gas separator. All production facilities will be located at a minimum of 25 feet from the toe of the back slope.
- No pits at the producing oil well location.

Drilling and Completion Water Sources and Amounts:

The proposed project is to drill and develop oil/gas wells into the porous Parkman formation, which is more sandstone than shale, so DEP plans no hydraulic fracturing. The project would be subject to the COAs for drilling of an oil/gas well in the BFO jurisdiction. Operator proposes using fresh water for drilling and cementing obtained from outside the project boundary and hauled to location by transport trucks using the existing and proposed roads shown in Maps A and C. DEP plans obtaining fresh water from either the Magna Services Water Loadout Station located north of Gillette, WY (SEO Permit #P189943W) drilled to a depth of 4,254 feet. A water analysis from the Magna Services Water Loadout Station is shown as Attachment E in DEP's POD. Operator estimated 15,000 barrels of water (approximately 10-15 truckloads per day) are required for drilling each well..

Average Daily Traffic (ADT):

DEP estimates that during the drilling phase of each individual well (about a 4-6 week period per well) the ADT to and from the location is approximately 2 large trucks (water haulers, cement trucks, etc.) and 6 personal pickup trucks per day. The ADT increases to 4-6 large trucks and 6 personal pickup trucks per day during the well completion process (a 3-4 week period per well). Finally, during the production phase the ADT will decrease to 1-2 pickup trucks per day. Traffic will use I-90, Kingsbury and Barlow all-weather roads.

Reasonably Foreseeable Development:

DEP owns lease hold across the entire Barlow Ranch as well as the Record and Maycock ranches to the north. Depending upon well results, future drilling in the area could fill in to 80 acre spacing.

Table 2.3. Disturbance During Construction and Interim/Production

Type	Submission Status	Length (ft)	Construction width (ft)	Final Width (ft)	Surface Disturbance (Acres)	Interim Disturbance
Existing Improved	APD	2,390	NA	18	NA	0.99 acres
Proposed Improved	APD	15,300	70	18	24.59	6.32 acres
Totals		**17,690**			**24.59**	**7.31 acres**

Recommended mitigation measures are in the Jo POD Surface Use Plan, WY-070-EA12-162 and BLM Recommended COAs for Conventional Application for Permit to Drill. Drilling and producing

mitigations are in Conditions of Approval for Conventional Application for Permit to Drill.

Table 2.4. Well Pad Disturbance During Construction and Interim/Production

Well Name	Drill Location	Status	Surface Disturbance	Interim Disturbance
Barlow Ranch 2195-2PH, 2295-1PH, and 2295-2PH	NWSE Section 22 T49N R75W	APD	9.65 acres	3.1 acres
Barlow Ranch 2895-2PH, 2795-1PH, and 2795-2PH	NESE Section 28 T49N R75W	APD	11.1 acres	4.6 acres
Barlow Ranch 3495-2PH, 3595-1PH, and 3595-2PH	NESE Section 34 T49N R75W	APD	8.62 acres	4.8 acres
Totals			**29.37 acres**	**12.5 acres**

Table 2.5. Overhead Power Disturbance

Overhead Power	Submission Status	Length (ft)	Width (ft)	Surface Disturbance Interim/Production(Acres)
Existing Overhead Electric	APD	43,575	NA	15.01
Proposed Overhead Electric*	APD	5,695	15	1.96
Total New OHP		49,270	NA	16.97

Table 2.6. Power Drop Disturbance

Electric Drops	Number of Drops	Surface Disturbance Per Power Drop (Acres)	Total Surface Disturbance (Acres)
APD	3	0.13	0.39

A third party will install and deliver the proposed electric power, and the existing line and proposed power drops are shown on the Jo POD Project Maps A and C. If the proposed overhead electric (OHE) power drops are changed by the third party at the time of construction, a sundry notice will be submitted to the BLM Authorized Officer. Please note that the third party is responsible for compliance with regulatory agencies and is responsible for securing and maintaining the necessary rights-of-way (ROWs).

Table 2.7. Lease Ownership at Surface Hole Location (SHL) /Bottom Hole Location (BHL)

#	APD (Well) Name	SHL	BHL	Lease # Lateral
1	Barlow Ranch 2195-2PH	FEE	FED	WYW173728, WYW147304 (BHL)
2	Barlow Ranch 2295-1PH	FEE	FEE	WYWWYW173728, FEE (BHL)
3	Barlow Ranch 2295-2PH	FEE	FED	WYW173728
4	Barlow Ranch 2895-2PH	FEE	FED	WYW147304, WYW13596 (BHL)
5	Barlow Ranch 2795-1PH	FEE	FED	WYW147304, WYW173728 (BHL)
6	Barlow Ranch 2795-2PH	FEE	FED	WYW147304, WYW174728 (BHL)
7	Barlow Ranch 3495-2PH	FEE	FEE	WYW147308, FEE (BHL)
8	Barlow Ranch 3595-1PH	FEE	FED	WYW147308
9	Barlow Ranch 3595-2PH	FEE	FED	WYW147308, WYW147298 (BHL)

All proposed wells have or cross federal minerals.

For a detailed description of design features and construction practices associated with the proposed project, refer to the surface use plan (SUP) and drilling plan included with the APD. Also see the subject APD for maps showing the proposed well location and associated facilities described above.

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

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

1. Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
2. Obtain necessary permits from agencies.
3. Offer water well agreements to the owners of record for permitted wells.
4. Incorporate several measures to alleviate resource impacts into their submitted surface use plan and drilling plan.

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

This proposal does not diverge from the goals and objectives in the Buffalo Resource Management Plan (RMP), 1985, 2001, 2003, 2011, and generally conforms to the terms and conditions of that land use plan, its amendments, and supporting FEISs, 1985, 2003.

3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment affected by the alternatives in Section 2. Aspects of the affected environment here focus on the major issues. Find a screening of all resources and land uses potentially affected in administrative record. Resources unaffected, or not affected beyond the level analyzed in the PRB FEIS, are outside this EA's scope**.** The Wyoming Game and Fish Department's (WGFD's) Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats (2009), make no distinction between surface disturbance impacts per well type or drilling technology. BLM's position is there is a rare lack of distinction in surface disturbance impacts attributable to well type, subject to showing a distinction, not a mere difference, and this tracks to surface disturbance issues as with soils, vegetation, invasive species, wetlands, cultural resources, etc. See, State Director Review WY-2010-023, Part 2, p. 3, and fn. 7. This supports national policy where no distinction exists in 43 CFR 3160 et. seq, leasing, and 2005's Energy Policy Act. (Kreckel 2007). The US issued its first patent on directional drilling in 1897, though it is an old technology it is subject to material and technique improvements.

Project Area Description

The Jo POD has 3 oil well pads, see Table 2.2. The POD site is approximately 21 miles west of Gillette, Campbell County, Wyoming. The Jo POD (project area) is approximately 3.6 square miles and includes the area within a 0.5 mile perimeter of the 3 well sites. Elevations range from approximately 4,200 feet to 4,700 feet above sea level. Topography is primarily gently rolling hills. A few rocky outcrops are present along the drainages in E1/2 Section 22 and NW Section 27. The climate is semi-arid, averaging 11.4 inches of precipitation annually, about 80% of which occurs between April and September. The 30-year mean maximum and minimum temperatures in July and January were 87.0º F and 7.6º F (ICF 2011).

The POD consists of approximately 80% sage-brush-grasslands, 17% grassland, and 3% other (bare soil, rock, water, and trees). While sage-brush habitats dominated the maJority of the project area, grasslands are more prevalent in the south and along some the flatter hilltops in the north. Common grasses in the project area included: crested wheatgrass (*Agropyron cristatum*), needle-and-thread (*Hesperostipa comate*), blue grama (*Bouteloua gracilis*), cheatgrass (*Bromus tectorum*), and native wheatgrasses (*Agropyron and Pascopyron spp*). Grasses are moderately tall (8 to 24 inches) and dense (less than 10% bare ground) throughout most of the project area (ICF 2011).

The most abundant shrub in the project area is Wyoming big sagebrush (*Artemisia tridentate wyomingensis*), which occurs in a patchy mosaic pattern of dense to sparse throughout the project area. Sagebrush stands were typically sparser and shorter (6 to 14 inches) in the south (Sections 34 and 35), and denser and taller (up to 38 inches) in the north, particularly dense stands noted in E1/2 Section 21 and NE Section 22. In addition, several patches of chokecherries (*Prunus virginianus*) are present in a draw in NE

Section 21. Rabbitbrush (*Chrysothamnus viscidiflorus*) and currant (*Ribes spp*.) were associated with hilltops and rock outcrops throughout the project area. Greasewood (*Sarcobatus vermiculatus*) was present along North Prong Dead Horse Creek in SW Section 34 and NE Section 3(ICF 2011).

The North Prong Dead Horse Creek flows east to west through the southern portion of the project area, and several of its tributaries are present in the remainder of the project area. Nearly all of the drainages are usually ephemeral, but an unusually high amount of rainfall was recently recorded.

Trees are common in the project area but are limited to individuals or small stands (2-10 trees) of cottonwoods (*Populus spp*) within the major drainages. Most of those trees were mature or senescing and relatively short (10-20 feet). Small stands of trees are along unnamed drainages in E1/2 Section 21, NW NW Section 34, SW SE Section 27, and scattered along North Prong Dead Horse Creek SW SW Section 34 to NE NE Section 3.

Current lands uses in the project are livestock grazing (cattle), coalbed natural gas (CBNG) and oil development. Scoria and two-track roads are present throughout the project, primarily associated with existing well sites. See Table 2.1 for adjacent or overlapping fluid mineral development.

3.1. Air Quality

Refer to the PRB FEIS pp. 3-291 to 3-299, for a 2003-era description of the air quality conditions. BLM incorporates by reference, Update of Task 3A Report for the Powder River Basin Coal Review Cumulative Air Quality Effects for 2020, BLM (AECOM), 2009, (Cumulative Air Quality Effects, 2009) as it captures the cumulative air quality effects of present and projected PRB fluid and solid mineral development. Existing air quality in the PRB is in attainment with all ambient air quality standards. It is also in an area that is in prevention of significant deterioration zone. PRB air quality is a rising concern due to ozone in the oil and gas producing Upper Green River Basin that exceeded EPA limits for 13 days in 2011 requiring 10 warnings to stay indoors; in addition to PRB-area air quality alerts issued in 2011 for particulate matter (PM), attributed to coal dust. Four sites monitor the air quality in the PRB: Cloud Peak in the Bighorn Mountains, Thunder Basin northeast of Gillette, Campbell County south of Gillette, and Gillette. In addition, the Wyoming Air Resource Monitoring System (WARMS) measures meteorological parameters from 6 sites, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (3 locations). These sites are at Sheridan, Taylor Reservoir, South Coal Reservoir, Buffalo, Juniper, and Newcastle. The northeast Wyoming visibility study is ongoing by the Wyoming Department of Environmental Quality (WDEQ). Sites adjacent to the Wyoming PRB-area are at Birney on the Tongue River 24 miles north of the Wyoming-Montana border, Broadus on the Powder River in Montana, and Devils Tower.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrogen oxides (NOx)) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- PM (dust) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas, road sanding during the winter months, and coal mines;
- Transport of air pollutants from emission sources located outside the region;
- NOx, PM, and other emissions from diesel trains and,
- SO2 and NOx from power plants.

3.2. Soils and Vegetation

Project area soils developed in alluvium and residuum derived mainly from the Wasatch Formation.

Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams resulting in a wide variety of surface and subsurface textures. Soil depths vary from deep on lesser slopes to shallow and very shallow on steeper slopes. Differences in lithology produced topographic and geomorphic variations in the area. An erosion resistant cap of clinker, terrace gravels, or sandstone often protects ridges and hills. Parent material chemistry may result in local concentration of salts.
Soils differ with topographic location, slope, and elevation. Topsoil depths available for reclamation range from 0 to 4 inches on ridges to 8+ inches in bottomland. Erosion potential varies depending on the soil type, vegetative cover, and slope. Reclamation potential of soils also varies in the project area.

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. Many of the soils and landforms of this area present distinct challenges for development, and /or eventual site reclamation. A tabulated summary of the dominant and important soil map units follows.

Table 3.1. Map Unit Symbol (MUS) and Name of Dominant or Important Soils in Jo POD Area

MUS	Map Unit Name	Ecological Site	Acres	Percent
217	Theedle-Shingle loams, 3 to 30% slopes	Loamy (Ly) 10-14 NP	1535	42%
158	Hiland-Bowbac fine sandy loams, 6 to 15% slopes	Sandy (Sy) 10-14 NP	480	13%
233	Ustic Torriorthents, gullied	Miscellaneous Areas	379	11%
215	Theedle-Kishona loams, 6 to 20% slopes	Loamy (Ly) 10-14 NP	208	6%
122	Cushman-Cambria loams, 6 to 15% slopes	Loamy (Ly) 10-14 NP	189	5%

Source: NRCS 2010.

See the NRCS Soil Survey 605 – South Campbell County (SSURGO) data. The Ecological Site interpretations include additional site-specific soil information.

Mapping a single taxonomic soil class is rare without including areas of other taxonomic classes. Consequently, every map unit comprises the soils or miscellaneous areas for of its name and some minor components that belong to taxonomic classes other than those of the maJor soils. Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are non-contrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Map unit descriptions mention the contrasting components. In complex soil patterns minor components may avoid observation and mention as it's impractical to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit does not diminish the usefulness or accuracy of the data. The objective of mapping is to separate the landscape into landforms or its segments that have similar use and management requirements, and to delineate pure taxonomic classes. The delineation of such segments on the map provides sufficient information for the development of resource plans. Onsite investigation defines and locates the soils and miscellaneous areas where plans call for intensive use of small areas.

3.3. Vegetation and Ecological Sites

Ecological Site Descriptions provide site and vegetation information needed for resource identification, management, and reclamation recommendations. To determine the appropriate Ecological Sites for the area contained within this proposed action, BLM specialists analyzed data from onsite field reconnaissance and NRCS published soil survey soils information. Dominant Ecological Sites and Plant Communities identified in this POD and its infrastructure are loamy, see Table 3.2.

Loamy Sites occur on gently undulating to rolling land on landforms which include hill sides, alluvial fans, ridges and stream terraces, in the 10-14 inch precipitation zone. The soils of this site are moderately deep to deep (greater than 20 inches to bedrock), well drained soils that formed in alluvium and residuum derived from sandstone and shale. These soils have moderate permeability.

Sandy Sites are the mapped as the second most common ecological site but onsite investigations identified the proposed pad locations and proposed access road locations only disturb *Loamy Sites. Sandy Sites* are not disturbed by this proposal.

The present plant community is a Mixed Sagebrush/Grass. Wyoming big sagebrush is a significant component of this Mixed Sagebrush/Grass 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 grass, and miscellaneous forbs. Dominant grasses include bluebunch wheatgrass, rhizomatous wheatgrass, blue grama, and little bluestem. Other grasses occurring on the state include Cusick's and Sandberg bluegrass, and prairie junegrass. Cheatgrass has invaded the state. Other vegetative species identified at onsite include: pricklypear, and fringed sagewort.

Table 3.2. Summary of Ecological Sites

Ecological Site	Acres	Percent
Loamy (Ly) 10-14 NP	2266.052492	63%
Sandy (Sy) 10-14 NP	722.8318682	20%
Miscellaneous Areas	379.4111321	10%
Lowland (LL) 10-14 NP	185.6987539	5%

3.4. Water Resources

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

3.4.1. Groundwater

The historical use for groundwater in this area was for stock water or domestic purposes. A search of the WSEO Ground Water Rights Database showed 11 registered stock and domestic water wells within 1 mile of the proposed wells in the project area with depths from 125 to 900 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36.

3.4.2. Surface Water

Jo POD is in the Dead Horse Creek drainage, a tributary of the Powder River. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater, springs, or other surface source – PRB FEIS, Chapter 9, Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank. See generally the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49.

3.5. Wetland/Riparian Areas

Ephemeral drainages, which flow into intermittent Dead Horse Creek, dissect the area. The proposed road to pads 1 and 2 crossed unnamed ephemeral streams. The ephemeral drainages have gentle slope with well vegetated bottoms with numerous small head-cut features. Table 3.3 lists the National Wetland Index (NWI) Designations in the POD boundary.

Table 3.3. NWI Designations

NWI Designation	Wetland Description	Acres
PABFh	Palustrine Aquatic Bed Semipermanently Flooded Diked/Impounded	1.4
PEMA	Palustrine Emergent Temporarily Flooded	4.2
PEMAh	Palustrine Emergent Temporarily Flooded Diked/Impounded	0.6
PEMB	Palustrine Emergent Saturated	11.4
PEMC	Palustrine Emergent Seasonally Flooded	20.8
PEMCh	Palustrine Emergent Seasonally Flooded Diked/Impounded	0.1
PEMCx	Palustrine Emergent Seasonally Flooded Excavated	0.3
	TOTAL	**38.8**

3.6. Invasive Species

Cheatgrass or downy brome (*Bromus tectorum*) and Japanese brome (*B. japonicus*) exist in the project area. These species are found in high densities and numerous locations throughout NE Wyoming. Diffuse knapweed and spotted knapweed, state-listed noxious weeds, were indicated as potentially present by a search of inventory maps and databases compiled by the University of Wyoming and modified to reflect local conditions by BLM Range Conservationist and Campbell County Weed and Pest Weed Specialist. Neither knapweed species was listed as present by the proponent. The onsites were conducted in March and April which is too early for new plants; however skeletons from old plants were not observed either. The state-listed noxious weeds are in PRB FEIS Table 3-21 (p. 3-104) and the Weed Species of Concern are in Table 3-22 (p. 3-105).

3.7. Fish and Wildlife

The PRB FEIS identified wildlife species occurring in the PRB, pp. 3-113 to 3-206. BLM wildlife biologists performed a habitat assessment in the project area on August 8, 2011 and February 1, 2011. 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. ICF Jones & Stokes, now ICF International, (ICF) performed a habitat assessment and wildlife inventory surveys. ICF surveyed for mountain plover, sharp-tailed grouse, Greater Sage-Grouse (GSG), bald eagle winter roost, raptor nests, and prairie dog colonies in 2011 (ICF 2011). Ute ladies'-tresses orchid (ULT) surveys occurred in 2011 (ICF 2011), as were surveys for blowout penstemon. An additional raptor survey was conducted during spring 2012 (ICF 2012). There were no formal surveys done for any species not mentioned above; however ICF biologists documented any sightings of BLM sensitive species and reported those observations to BFO. ICF conducted surveys according to the PRB Interagency Working

Group's protocols, available at: http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html.

3.7.1. Big Game

Big game species in the project area are mule deer and pronghorn antelope. The PRB FEIS discussed the affected environment for them on pp. 3-117 to 3-122 (pronghorn) and pp. 3-127 to 3-132 (mule deer). BLM expects the affected environment to be similar as described in the South Prong Unit 1&2 and Laskie Draw POD EA, WY-070-08-142, incorporated here by reference (Section 3.3.1., pp. 30-31, respectively.

3.7.2. Small Game Birds (Greater Sage-Grouse (GSG): see Candidate Species, below)

3.7.2.1. Sharp tailed Grouse

The PRB FEIS discussed the affected environment for plains sharp-tailed grouse, pp. 3-148 to 3-150. BLM discusses plains sharp-tailed grouse here because the public identified specific concerns for this species during the scoping process for the PRB FEIS. The Wyoming Game & Fish Department (WGFD) indicates that the nearest known sharp-tailed grouse (Iberlin) is approximately 11 miles southwest of Jo POD. No sharp-tailed grouse, or sign thereof, were documented within the project during the spring 2011 surveys (ICF 2011). Habitats in the project area have the potential to support sharp-tailed grouse during portions of the year. The mosaic pattern of grassland and sagebrush-grasslands could provide habitat from April through October. The cottonwoods, currant, and chokecherry within the project area could potentially provide buds and berries for limited winter forage (ICF 2011).

3.7.3. Non-Game

3.7.3.1. Raptors

The PRB FEIS discussed the affected environment for raptors, pp. 3-141 to 3-148. According to the BLM raptor database (BLM 2012), 3 nest records (672, 12513, and 12514) exist in the project area. During the May 2011 survey by ICF, nest 672 was gone and the remaining 2 nests were inactive. Two new raptor nests (13324 and 13325) were documented during the 2012 survey (ICF 2012). For nest locations and descriptions refer to the "Jo Plan of Development Habitat Assessments and Biological Surveys" (ICF 2012) in the project file. 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. ICF documented several raptors in the project area during spring 2011 surveys. Several American kestrels (*Falco sparverius*) were in the cottonwood habitats throughout the project area. On May 9, an adult ferruginous hawk (*Buteo regalis*) was observed perched in a cottonwood tree in NE SW Section 27 and later flew off to the north. On June 1, a pair of red-tailed hawks (*Buteo jamaicensis*) was soaring above NE Section 22 (ICF 2011).

3.7.4. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds, pp. 3-150 to 3-153. Migratory birds migrate for breeding and foraging at some point in the year. The BLM-FWS MOU (2010) promotes the conservation of migratory birds, as directed through Executive Order 13186 (Federal Register V. 66, No. 11). BLM includes migratory birds in every NEPA analysis of actions having potential to affect migratory bird species of concern to fulfill obligations under the Migratory Bird Treaty Act (MBTA). BLM encourages voluntary design features and conservation measures agreeing with those in the programmatic mitigation in Appendix A of the PRB ROD. Habitats occurring near the proposed well locations 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, and grasshopper sparrow. Of these, 3 species are identified on the BLM Wyoming 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 3.4.

Table 3.4. Migratory Birds Occurring in Shrub-Steppe Habitat in NE Wyoming (Nicholoff 2003)

Level	Species	Wyoming BLM Sensitive
Level I	Brewer's sparrow	Yes
Level II	Lark bunting	No
	Lark sparrow	No
	Loggerhead shrike	Yes
	Sage thrasher	Yes
	Vesper sparrow	No

3.7.5. Threatened, Endangered, Candidate, Special Status (Sensitive) Species (SSS)

Project effects will not impact threatened, endangered, candidate, and proposed species occurring in the area beyond the level analyzed in the PRB FEIS. A discussion of the affected environment is in the PRB FEIS, pp. 3-174 to 3-179; also see Table A.3, Appendix A below for specific species and their habitats.

3.7.5.1. Ute Ladies'-Tresses Orchid (ULT)

The Ute ladies'-tresses orchid (ULT) is threatened under the ESA. The PRB FEIS discussed the affected environment for ULT, p. 3-175. ICF did a survey for the species during the flowering period (August) of 2011. The findings of the survey concluded that areas of potential habitat were completely dry (ICF 2011). For a detailed description of habitat and observation of vegetation/soils in the POD, refer to the "Devon Energy's Jo POD: Ute Ladies'-tresses Orchid Survey Results (2011)" in the project file. ULT habitat is not present in the project area and the species is not expected to occur.

3.7.6. Candidate Species

3.7.6.1. Greater Sage-Grouse (GSG)

The PRB FEIS addressed the affected environment for GSG, pp. 3-194 to 3-199. The GSG's regulatory and biologic status changed since issuance of the FEIS:

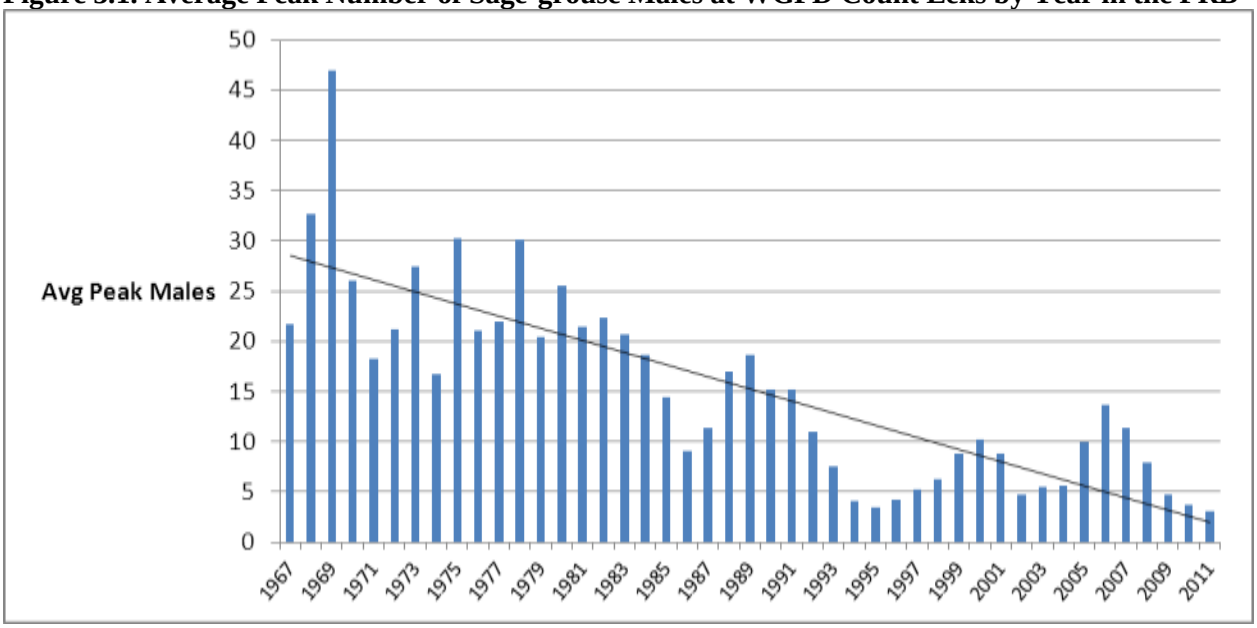
1. 2005-2007: The PRB FEIS predicted that a ¼ mile year-round controlled surface use lek buffer, and timing limitations restricting surface disturbance within 2 miles of leks, would be sufficient for protection of GSG populations. Several recent studies and literature reviews indicate that the restrictions' spatial scale, and timing limitations, may not be large enough to alleviate impacts to GSG (Holleran 2005, Walker et al 2007, Taylor et al 2012).
2. January, 2005: U.S. Fish and Wildlife Service (FWS) warranted that the GSG was inappropriate for listing under the Endangered Species Act.
3. December, 2007: The U.S. District Court remanded the "not warranted" decision, finding a flawed decision-making process and ordered the FWS to conduct a new Status Review; Western Watersheds Project v. FWS, 535 F. Supp. 2d 1173 (D. Idaho 2007).
4. August, 2008: The WY BLM implemented management of identified connectivity habitats in support of the population management objectives set by the State of Wyoming (Wyoming Governor's Executive Order (EO) 2011-5), in accordance with the BLM Wyoming Instruction Memorandums (IM), most recently, IM- WY-2012-019.
5. January 2008: The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas

Development Effects to Nesting Habitat recommended land managers consider impacts on leks within 4 miles of oil and gas developments.

6. September, 2009: In its Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats, WGFD categorized impacts to GSG by number of well pad locations per square mile within 2 miles of a lek.
7. November, 2010: FWS warranted that the GSG justified listing across its range, but precluded listing due to higher priorities (FWS 2010). The GSG is a listing candidate.
8. March, 2012: WY BLM released the report, "Viability analyses for conservation of GSG populations: Buffalo Field Office, Wyoming," indicating that a viable population of GSG remains in the PRB, but the combined impacts of multiple stressors, including West Nile virus (WNv) and energy development, threaten that viability (Taylor et al 20012).

The GSG population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2011b). 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).

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



The project area does not overlap with any of the GSG core population or the connectivity areas designated by the State of Wyoming (Wyoming EO 2011-5). Current WGFD records indicate 4 occupied GSG leks (Barlow, Kingsbury South, Watsabaugh III, and Watsabaugh IV) are located within 4 miles of the project area. The Barlow and Kingsbury South leks are located 0.7 mile and 3.8 miles east of the POD site, while the Watsabaugh III and Watsabaugh IV leks are 3.1 miles northeast and 1.7 miles northwest of the Jo POD site. For locations and survey results of the 4 leks, refer to the "Jo Plan of Development Habitat Assessments and Biological Surveys", see Table 1, pp. 6 (ICF 2011) in the project file.

Currently there are 613 existing (producing or approved) wells in a 4 mile radius (50.24 miles) of the Jo POD, (Automated Fluid Minerals Support System [AFMSS] and Wyoming Oil and Gas Commission [WOGCC], June20, 2012) resulting in a density of 12.2 wells per square mile.

Impacts to GSG from oil and gas development are most 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 30 documented leks within 12.4 miles of the proposed project boundary. Currently there are 7,199 existing wells within 12.4 miles of the project area, an area of 482 miles (an average of 14.9 wells per square mile).

Site Specific Habitat
GSG habitat models indicate that approximately 30% the project area may contain high quality GSG nesting habitat and approximately 60% of the project area may contain wintering habitat (Walker et al. 2007). See Section 3.0, Project Description, for additional site-specific details. Portions of the project area are fragmented from existing infrastructure (8.3 miles of overhead power) and 1.7 miles of interstate.
Interstate I-90 (travels from the SW ¼ to the NE ¼ of Section 27) and an above ground high voltage electrical transmission line (parallels north of interstate), as well as, 6 other overhead power lines (OHP) are all within the Jo POD.

3.7.7. Special Status (Sensitive) Species (SSS)

The PRB FEIS discussed the affected environment for SSS, p. 3-174 to 201. The authority for the SSS comes from the ESA, as amended; Title II of the Sikes Act, as amended; the FLPMA; Department Manual 235.1.1A and BLM Manual 6840. Appendix A, Table A.2 lists those SSS that may occur in the project area. The table also includes a brief description of the habitat requirements for each species. Wyoming BLM annually updates its list of SSS to focus management to maintain habitats to preclude listing as a threatened or endangered species. The policy goals are:

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

Wyoming BLM updates SSS on its website: http://www.blm.gov/wy/st/en/programs/Wildlife.html. BLM discusses those SSS impacted beyond the level analyzed in the PRB FEIS, below.

3.7.7.1. Bald Eagle

The PRB FEIS discussed the affected environment for bald eagles, p. 3-175. The FWS listed the bald eagle as a threatened species when BLM approved the PRB FEIS. FWS removed the bald eagle from threatened status on August 8, 2007 due to its successful recovery. The bald eagle has protection under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act (MBTA). The project area has minimal roosting/nesting habitat as described in Section 3.0 Project Description. The interstate (I-90) may provide carrion for eagles to feed on. One adult bald eagle was observed within 1.0 mile (SE NE Section 3 T48N, R75W) of the project area during the winter 2010/2011 aerial survey (ICF 2011).

3.7.7.2. Mountain Plover

The PRB FEIS discussed the affected environment for mountain plover, pp. 3-177 to 3-178. The FWS proposed the mountain plover for listing as a threatened species when BLM approved the PRB FEIS. The FWS withdrew the proposal, finding that the population larger than thought and was no longer declining. On June 29, 2010 The FWS reinstated, on June 29, 2010, a December 5, 2002 proposed rule (67 FR 72396) to list the mountain plover as a threatened species. On May 12, 2011, The FWS withdrew the proposal to list the mountain plover as a threatened species on May 12, 2011. Suitable mountain plover habitat is not present within the project area. The project area lacks short grass vegetation (less than 6 inches) and ground slopes less than 4%.

3.7.7.3. Sage Thrasher

The PRB FEIS discussed the affected environment for sage thrasher, pp. 3-199 to 3-200. Sagebrush

grasslands in the project area provide suitable nesting habitat for sage thrasher, and the species is suspected to occur.

3.7.7.4. Brewer's Sparrow

The PRB FEIS discussed the affected environment for Brewer's sparrow, p. 3-200. Sagebrush grassland areas in the project area provide suitable nesting habitat for Brewer's sparrows, and the species is suspected to occur.

3.7.8. West Nile Virus

West Nile virus (WNv) is a mosquito-borne disease that can cause encephalitis or brain infection. Mosquitoes spread this virus after they feed on infected birds and then bite people, other birds, and animals. WNv is not spread by person-to-person contact, and there is no evidence that people can get the virus by handling infected animals. WNv firmly established and spread across the US since its discovery in 1999 in New York. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. Though less than 1% of mosquitoes carry WNv, they still are effective in transmitting the virus to humans, horses, and wildlife. *Culex tarsalis* appears to be the most common mosquito to vector, WNv. The human health issues related to WNv are well documented and appear to have leveled off. Historic data collected by the CDC and published by the USGS at: www.westnilemaps.usgs.gov is summarized in Table 3.5, showing data from the PRB - Campbell, Sheridan, and Johnson Counties.

Table 3.5. Historical West Nile Virus Information in Campbell, Sheridan, and Johnson Counties

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

Source: Wyoming Department of Health, www.badskeeter.org/detections.html.

Human cases of WNv in Wyoming occur primarily in the late summer or early fall. There is some evidence that the incidence of WNv tapers off over several years after a peak following initial outbreak (Litzel and Mooney, personal conversations). If this is the case, occurrences in Wyoming may exhibit a gradual decline in the number of reported cases.

Although most of the attention focused on human health issues, WNv had an impact on vertebrate wildlife populations. At a recent conference at the Smithsonian Environmental Research Center, scientists disclosed WNv was detected in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations incurred very high mortality, particularly crows, jays and related species. Raptor species also appear to be highly susceptible to WNv. Researchers documented that 36 raptors died from WNv in Wyoming in 2003. These included golden eagle, red-tailed hawk, ferruginous hawk, American kestrel, Cooper's hawk, northern goshawk, great-horned owl, prairie falcon, and Swainson's hawk (Cornish et al. 2003). Actual mortality is likely to be greater. Population impacts of WNv on raptors are unknown at present. The Wyoming State Vet Lab determined 22 GSG in one study

project (90% of the study birds), succumbed to WNv in the PRB in 2003. While birds infected with WNv have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003, Holloran 2005, Clark 2006, Walker 2011, 2007).

Mosquitoes can potentially breed in any standing water that lasts more than 4 days. Preliminary research conducted in the PRB indicates WNv mosquito vectors were notably more abundant on a developed CBNG site than 2 similar undeveloped sites (Walker et al. 2003). Reducing the population of mosquitoes, especially species that are apparently involved with bird-to-bird transmission of WNv, such as *Culex tarsalis*, can help to reduce or eliminate the presence of virus in a given geographical area (APHIS 2002). The most important step any property owner can take to control such mosquito populations is to remove all potential man-made sources of standing water in which mosquitoes might breed (APHIS 2002).

The most common pesticide treatment is to place larvicidal briquettes in small standing water pools along drainages or every 100 feet along the shoreline of reservoirs and ponds. It is generally accepted that it is not necessary to place the briquettes in the main water body because wave action prevents this environment from being optimum mosquito breeding habitat. Follow-up treatment of adult mosquitoes with malathion may be needed every 3 to 4 days to control adults following application of larvicide (Mooney, personal conversation). These treatment methods seem to be effective when focused on specific target areas, especially near communities, however they have not been applied over large areas.

The WDEQ and the Wyoming Department of Health sent a letter to operators on June 30, 2004. The letter encouraged people employed in occupations that require extended periods of outdoor labor, be provided educational material by their employers about WNv to reduce the risk of WNv transmission. The letter encouraged companies to contact either local Weed and Pest Districts or the Wyoming Department of Health for surface water treatment options.

3.8. Cultural Resources

DEP provided BLM with a Class III cultural resource inventory (BFO project no. 70110081) for the Jo POD prior to on-the-ground work. BLM performed an additional Class III cultural resource inventory prior to on-the-ground project work (BFO project no. 70120065). BLM received and performed combination block and linear class III cultural resource inventories following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the *Wyoming State Historic Preservation Office Format, Guidelines, and Standards for Class II and III Reports*. Seth Lambert, BLM Archeologist, reviewed the reports for technical adequacy and compliance with BLM standards, and determined them adequate. The following resources are in or near the project area.

Table 3.6. Cultural Resources Inventory Results

Site Number	Site Type	National Register Eligibility
48CA3280	Historic	NE
48CA3281	Prehistoric	NE
48CA4996	Historic	NE

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

3.9. Visual Resources Management (VRM)

The project area is in a portion of the Powder River Breaks that has moderate oil and gas development. The human influence is apparent on the landscape, ranch homes as well as several wells and compressor

stations are visible from Interstate-90 which runs through the middle of the POD. Existing roads, pipeline scars, overhead power lines, and fence lines are present in the viewshed. The project area is a VRM Class III. The Class III objective provides for management activities which partially retain the existing character of the landscape. The level of change to the characteristic landscape could be moderate. Contrasts would be seen but remain subordinate to the existing landscape character.

4. ENVIRONMENTAL EFFECTS

Alternative B is the proposal for the Jo POD with 9 APDs. DEP proposes drilling, completing, and equipping 9 horizontal oil wells to develop federal minerals. Map analysis and communication with DEP shows that in large part the proposed well pads and surface-hole locations predicate on the location of federal fluid mineral leases and those appropriate down-hole locations. DEP proposes producing from the Parkman Formation at an average depth of 7,300 feet. The Parkman Formation's porosity is great enough to preclude hydraulic fracturing as its more sandstone than shale. The oil flows through the formation without needing augmented fractures in the rock to free-up the oil. BLM will consider having DEP apply for a sundry notice approval if DEP determines it requires hydraulic fracturing for these proposed wells so BLM may conduct the NEPA analysis. This analysis presumes DEP and BLM follow and enforce the APDs' drilling plan and Onshore Oil and Gas Order Nos. 2 and 7.

4.1. Air Quality

In the project area, air quality impacts would occur during construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, as well as drilling rig and vehicle engine exhaust) and production (including well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. Air quality impacts modeled in the PRB FEIS and Cumulative Air Quality Effects, 2009 concluded that PRB projected fluid and solid development would not violate state, tribal, or federal air quality standards and this project is well within the projected development parameters.

4.2. Soils and Vegetation

4.2.1. Direct and Indirect Effects

Anticipated impacts occurring include soil rutting and mixing, compaction, increased erosion potential, and loss of soil productivity. The most notable impacts would occur in association with the construction of well pads, staging areas, and roads. Construction of these facilities requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. Construction activities mix the soil profiles with a corresponding loss of soil structure. Mixing may result in removal, dilution, or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Less desirable inorganic compounds such as carbonates, salts, or weathered materials could be relocated and have a negative impact on revegetation.

Soils compaction results from the construction of wells and associated facilities, continued vehicle and foot traffic as well as operational activities. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction leads to a loss of soil structure; decreased infiltration, permeability, and soil aeration; as well as increased runoff and erosion.

Increased erosion can lead to a decrease in soil fertility and an increase in sedimentation. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted.

The potential for erosion would increase through the loss of vegetation cover and soil structure as compared to an undisturbed state. Soil productivity would decrease, primarily as a result of profile mixing and compaction along with the loss in vegetative cover. These impacts would begin immediately as the soils would be subjected to grading and construction activities and impacts would continue for the term of operations. The impacts on soils would move to a steady state as construction activities were completed and well production/maintenance operations begin.

An important component of soils in Wyoming's semiarid rangelands, especially in the Wyoming big sagebrush cover type, are biological soil crusts, or cryptogamic soils that occupy ground area not covered with vascular plants. Biological soil crusts are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (Belnap et al. 2001). They adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily damaged or destroyed by surface disturbances associated with construction activities.
Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting physically severs roots, thus reducing soil aeration and infiltration thereby degrading the rooting environment. Rutting may result in topsoil and subsoil mixing, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by diverting and concentrating water flow thus accelerating erosion. Soil mixing typically results in a decrease in soil fertility and a disruption of soil structure.

For the purpose of analysis:
-Operator proposed 3 engineered sections of road to gain access to the wells due to drainage crossings, with cuts/fills exceeding 5 feet. The operator is responsible for having the licensed professional engineer(s) certify that the construction of those roads meet the design criteria and are built to Bureau standards. These engineered road segments should be completed, including any culverts, and required surfacing, before the drilling rig or other drilling equipment moves onto the pad in order to protect erodible soils. Construction completed to BLM approvable standards will reduce down drainage sedimentation, erosion, and scouring caused by frequent failure of in-channel structures.

-An engineered pad is needed at each of the 9 wells (3 locations) listed in Table 2.1. Proposed Wells – Alternative B to safely drill the wells on undulating topography, the amount of disturbance associated with conventional oil development, with projected cuts/fills potentially exceeding 25 feet.

-Slopes will be reduced to 3:1 (33% slope) or have mitigation applied to reduce the slope or slope length to address erosion and stability issues.

-Operator submitted a Private Landowner Preferred Seed Mixture seed mix for the Jo POD.

-The BLM will evaluate reclamation success using the requirements in the BLM State Wide Reclamation Policy found at: http://www.blm.gov/wy/st/en/programs/reclamation.

4.2.2. Cumulative Effects

The cumulative effects associated with Alternative B are very likely inside analysis parameters and impacts described in the PRB FEIS with the approval of the project components listed in Table 4. For details on expected cumulative impacts, refer to the referenced PRB FEIS, Chapter 4. The designation of the duration of disturbance is defined in the PRB FEIS (pp. 4-1 and 4-151). Most soil disturbances could be short term impacts with expedient interim reclamation and site stabilization.

4.2.3. Mitigation Measures

Mitigation measures, surface upgrades, applicant committed measures, and adherence to COAs and the

WY Reclamation Policy would mitigate or reduce the impacts described above. DEP and BLM should apply the following mitigation to reduce impacts to soils and vegetation from surface disturbance:
-To protect erodible soils, all engineered road segments should be completed, including culverts, low water crossings, and required surfacing, before the drilling rig or drilling equipment moves to the pad.

-A company licensed professional engineer(s) will certify that the construction of engineered roads meet the design criteria(s) and are built Bureau standards.

-The BLM will evaluate reclamation success using the requirements set forth in the State Wide Reclamation Policy revised 2011, see policy at the above weblink and incorporated herein.

-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. Stream crossings 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.

4.2.4. Residual Effects

Residual effects across the POD would include a long-term loss of soil productivity associated with well pads and roads. The PRB FEIS identified residual effects (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established. Due to the presence of erosive soils and the topography of the project area erosion will occur. Rilling and gullying of cut and fill slopes on, access/utility corridors, will take place. Impacts from livestock to stabilized cut and fill slopes will limit soils becoming stable and getting vegetation establish.

The PRB FEIS defined the designation of the duration of disturbance, 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”.

Impacts to vegetation and soils from surface disturbance will be reduced, by following the operator’s plans and BLM applied mitigation. Construction of new access roads has been reduced by placing the access road in previous disturbance from installation and maintenance of a nearby high power electric line. All disturbances associated with the proposed action are long term. With the reclamation status of the project area being rated as fair and field observations showing areas of reclamation success of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, etc.) would ensure land productivity/stability is regained and maximized.

4.3. Vegetation and Ecological Sites

4.3.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to vegetation, pp. 4-153 to 4-164. Direct effects to vegetation would occur from ground disturbance caused by construction of well pads, ancillary facilities, associated pipelines, and roads. Vegetated areas disturbed and reclaimed within 1 to 3 years of the initial disturbance would suffer short-term effects. 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 where reclamation for the life of the project. Indirect effects, as described in the PRB FEIS, would include the spread and/or establishment of noxious weeds, the alteration in surface water flows affecting vegetation communities, alteration in ecosystem biodiversity, and changes in wildlife habitat. Expediently stabilizing the disturbance through interim reclamation and the implementation of erosion control measures would mitigate these impacts.

BLM anticipates long-term impacts to sagebrush due to slow recovery rates and the duration between construction and re-disturbance during final reclamation. Complete restoration of sagebrush shrubland after disturbance can often take decades. Studies of Wyoming big sagebrush post fire recovery intervals indicated that post-fire regeneration of this species can take 50 to 120 years to regenerate naturally (Cooper et al. 2007; Baker 2006). Wyoming big sagebrush took approximately 17 years to re-establish after chemical removal in Wyoming (Johnson 1969) and sagebrush species can take 3 to 7 years to begin to spread in locations where seed drilling or transplant of seedlings occurred (Tirmenstein 1999).

4.3.2. Cumulative Effects

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

4.3.3. Mitigation Measures

Implementation of the mitigation measures in the COAs, Jo 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. The Operator should follow the reclamation requirements in the BLM State Wide Reclamation Policy found at: http://www.blm.gov/wy/st/en/programs/reclamation. See mitigation section in the soils section above for a full description of the policy as it applies equally to ecological sites.

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

Sandy/Loamy/Clayey Ecological Site Seed Mix		
Species	**% in Mix**	**Lbs PLS***
Thickspike Wheatgrass (Elymus lanceolatus ssp. lanceolatus)	25	3.0
Prairie sandreed (Calamovilfa longifolia)	35	4.2
Indian ricegrass (Achnatherum hymenoides)	25	3.0
Prairie coneflower (Ratibida columnifera)	5	0.6
Green needlegrass (Nassella viridula)	5	0.6
Blue flax (Linum lewisii)	5	0.6
Totals	**100%**	**12 lbs/acre**

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

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

4.3.4. Residual Effects

Residual effects would include a long-term loss of soil productivity associated with well pads and roads. Residual effects were 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.

4.4. Water Resources

4.4.1. Groundwater

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. *Insert* Depth to Fox Hills and casing program proposed for potential groundwater source zones. Compliance with the drilling and completion plans and Onshore Oil and Gas Orders Nos. 2 and 7 will ensure there is no adverse impact on ground water. The volume of water produced by this federal mineral development is unknowable at the time of permitting. DEP will have to produce the wells 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, DEP will submit a Sundry to the BLM within 90 days of first production which includes a representative water analysis and the final proposal for water management. The quality of water produced in association with conventional oil and gas historically was such that surface discharge would not be possible without treatment. Initial water production is quite low in most cases. There are 3 common alternatives for water management: re-injection, deep disposal, or disposal into pits. All alternatives would be protective of groundwater resources when performed in compliance with state and federal regulations.

4.4.2. Surface Water

4.4.2.1. Direct and Indirect Effects

Access roads proposed to for the Jo POD crosses 3 ephemeral drainages that are tributaries to Dead Horse Creek. The channels are primarily well vegetated grassy swales, without defined bed and bank. The drainage crossings are engineered and contain culverts sized to handle a 25 year flood event. Placement of the crossing was analyzed during field visits to determine the best placement of the road with the least disturbance.

4.5. Wetland/Riparian Area

4.5.1. Direct and Indirect Effects

Watersheds, including natural drainages, would not be adversely impacted by 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.

4.5.2. Cumulative Effects

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, please refer to the PRB FEIS.

4.5.3. Mitigation Measures

Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112, Bridges and Major Culverts and Manual 9113, Roads. Streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.

The operator will collect a water sample representative of the water produced from this (these) wells for analysis within 30 to 60 days of initial production. Results of the analysis will be submitted to the BLM Authorized Officer as soon as they become available. The constituents analyzed in the water quality analyses will be the same as those required by the WDEQ for WYPDES permit using approved EPA test

procedures (40CFR136 or 40CRF136.5). After well completion, the operator shall submit a Sundry Notice for approval of disposal of all produced water in accordance with Onshore Oil and Gas Order No. 7, Disposal of Produced Water.

4.5.4. Residual Effects

The lifespan of the Jo POD project is estimated to last 40 years if the wells are in producing mode during the whole 40 year span. Once the wells have been plugged and abandoned and the POD fully reclaimed there should not be any noticeable residual effects to the environment if reclamation of the drainage crossings on the access roads are done properly.

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
3. Education

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) 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

Cumulative effects resulting from noxious and invasive weed species are discussed in the PRB FEIS, p. 4-171. Species of concern identified in the Jo POD, include: Diffuse knapweed and spotted knapweed.

4.6.3. Mitigation Measures

The operator committed to the control of noxious weeds and weed species of concern in their Master Surface Use Plan (MSUP). Application of the operator's reclamation plans will discourage establishment of invasive species during operations. In addition, measures incorporated into the programmatic COAs listed in the COA document will further mitigate the potential spread and establishment of weed species.

4.6.4. Residual Effects

Control efforts by the operator would be limited to the surface disturbance associated the construction and operation of the project. Cheatgrass and other weed species that are present within non-physically disturbed areas of the project area are anticipated to continue to spread unless control efforts are expanded – including cheatgrass and to a lesser extent, Japanese brome.

4.7. Fish and Wildlife

4.7.1. Big Game

4.7.1.1. Direct and Indirect Effects

The PRB FEIS analyzed impacts to big game, pp. 4-181 to 4-210. As discussed in that document, impacts to mule deer may occur through alterations in hunting and/or poaching, increased vehicle collisions, harassment and displacement, increased noise, increased dust, alterations in nutritional status and reproductive success, increased fragmentation, loss or degradation of habitats, reduction in habitat effectiveness, and declines in populations. The current populations for pronghorn, white-tailed deer, mule

deer, and elk are above, above, below, and above WGFD goals, respectively.

4.7.1.2. Cumulative Effects

Refer to the PRB FEIS for big game cumulative impacts, p. 4-211.

4.7.1.3. Mitigation Measures

BFO recommends applying no further mitigation measures.

4.7.1.4. Residual Effects

None identified.

4.7.2. Plains Sharp-tailed Grouse

Sharp-tailed grouse may avoid habitats adjacent to the project area, particularly during drilling and construction. There is no direct, indirect, cumulative, or residual impact expected at the nearest lek.

4.7.3. Non-Game

4.7.3.1. Raptors

4.7.3.1.1. Direct and Indirect Effects

The PRB FEIS analyzed direct and indirect effects to raptors, pp. 4-216 to 4-221. This project will result in disturbance in proximity of nesting raptors, including direct loss of foraging habitats and indirect losses associated with declines in habitat effectiveness. All raptors using nests in the vicinity of the project will likely be impacted to some extent by the human disturbance associated with operation and maintenance. Two active raptor nests (13324 and 13325) are within 0.5 miles of well pad #1 and #2. Nests 12513 and 12514 were inactive during the 2010 and 2011 surveys. Nest 672 is reported gone during 2012 survey.

Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If disruptive activities occur during nesting, they could be sufficient to cause adult birds to remain away from eggs or chicks causing overheating or chilling. This can result in egg or chick death. Prolonged disturbance can also lead to the abandonment of the nest by the adults. Routine human activities near these nests can also draw increased predator activity to the area and resulting in increased nest predation. To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests and recommends all infrastructures requiring human visitation be located to provide adequate biologic buffer for nesting raptors. A biologic buffer is a combination of distance and visual screening that provides nesting raptors with security such that they will not be flushed by routine activities.

4.7.3.1.2. Cumulative Effects

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

4.7.3.1.3. Mitigation Measures

The BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around active raptor nests to reduce the risk of decreased productivity or nest failure. Wells pads #1 and #2 will have the timing limitation applied as a condition of approval (COA).

4.7.3.1.4. Residual Impacts

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

4.7.4. Migratory Birds

4.7.4.1. Direct and Indirect Effects

The PRB FEIS discussed the direct and indirect effect to migratory birds, pp. 4-231 to 4-235. Disturbance of habitat in the project area is likely to impact migratory birds. Native habitats will be lost directly with the construction of wells, roads, and pipelines. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. Ingelfinger (2004) identified that the density of breeding Brewer's sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 m of dirt roads in a natural gas field. Effects occurred along roads with light traffic volume (less than 12 vehicles per day). The increasing density of roads constructed in developing natural gas fields exacerbated the problem creating substantial areas of impact where indirect habitat losses through displacement were much greater than the direct physical habitat losses.

4.7.4.2. Cumulative Effects

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

4.7.4.3. Mitigation Measures

BLM proposes no timing limitations on surface disturbing activities specifically for migratory birds. However, raptor and GSG timing limitations on surface disturbing activities will also serve to mitigate impacts to nesting migratory birds. GSG timing limitations apply towards pads #1 and #2.

4.7.4.4. Residual Effects

Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where BLM applies GSG or raptors nesting timing limitations, nesting migratory birds receive protection. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable. GSG timing limitations will apply towards 2 of the 3 well pads. Those migratory bird species and individuals that are still nesting when the GSG timing limitations are over (June 30) may have nests destroyed, or be disturbed, by construction activities. Protections around active raptor nests (Feb 1- July 31) extend past most migratory bird nesting seasons. Only a percentage of known nests are active any given year, so the protections for migratory birds from June 30 - July 31 will depend on how many raptor nests are active. Reclamation and other activities that occur in the spring may be detrimental to migratory bird survival. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts.

4.7.5. Threatened, Endangered, Candidate, Special Status (Sensitive) Species (SSS)

Based on the last species list for the Buffalo Field Office, dated July 22, 2011, the Ute Ladies'-tresses Orchid is the only listed species requiring an effects determination (ESA Section 7 (2)).

4.7.5.1. Ute Ladies'-Tresses Orchid (ULT)

Based on the last species list for the Buffalo Field Office, dated July 22, 2011, the Ute Ladies'-tresses Orchid is the only listed species requiring an effects determination (ESA Section 7 (2).

4.7.5.2. Direct and Indirect Effects

Suitable habitat is not present in the project area and implementation of the proposed project will have "***no effect***" on ULT.

4.7.5.3. Cumulative Effects

The PRB FEIS discussed the cumulative effects to ULT, pp. 4-253 to 4-254).

4.7.5.4. Mitigation Measures

BLM proposes no mitigation.

4.7.5.5. Residual Effects

BLM anticipates no residual effects.

4.7.6. Candidate Species Greater Sage-Grouse (GSG)

4.7.6.1. 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. The *12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered* (FWS 2010) and chapters 15-21 of Greater Sage-grouse Ecology and Conservation of a Landscape Species and its Habitats (Knick and Connelly 2011) – both discuss impacts to GSG associated with energy development in detail. Implementation of the project will adversely impact nesting habitat, both through direct loss and avoidance of the area by GSG. To protect nesting and brood rearing GSG, BLM will implement a timing limitation (1 March to 15 June) on all surface-disturbing activities associated with the proposed project. The PRB FEIS discussed direct and indirect impacts to GSG in more detail, pp. 4-257 to 4-273.

Implementation of Jo POD will cause sagebrush habitat removal and functional loss of habitat from fragmentation and anthropogenic activity. The drilling and construction of the 3 well pads will result in approximately 29.37 acres (interim disturbance) of new surface disturbance. DEP will use 2,390 feet of existing improved road and construct approximately 15,300 feet of new improved roads in GSG habitat.

4.7.6.2. Cumulative Effects

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. Impacts to GSG are categorized 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. Extreme impacts mean those where the function of an important wildlife habitat is substantially impaired or lost.

Jo POD is within 2 miles of 2 GSG leks. Currently there are 613 existing (producing or approved) wells within a 4 mile radius (50.24 miles) of the Jo POD, (Automated Fluid Minerals Support System [AFMSS] and Wyoming Oil and Gas Commission [WOGCC], June 29, 2012) resulting in a density of 12.2 wells per square mile. There are 512 wells proposed within 4 miles of the Jo POD resulting in a cumulative density of 22.4wells per square mile. Nine of those 512 wells are from this project.

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 2004a, Rowland et al. 2005, WGFD 2005, Naugle et al. in press), 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 2004b, Walker et al. 2007, Cornish pers. comm.). The BFO Resource Management Plan (BLM 2001) and the PRB FEIS Record of Decision (BLM 2003) included a 2-mile timing limitation on surface-disturbing activities around GSG leks. The 2-mile

measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA) (BLM 2004). Wyoming BLM adopted the 2-mile recommendation in 1990 (BLM 1990). The 2-mile recommendation was based on early research which indicated between 59% and 87% of GSG nests were within 2 miles of a lek (BLM 2004). These studies occurred 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 BFO 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 Powder River Basin suggests that impacts to leks from energy development are discernible out to a minimum of 4 miles, and that some leks in this radius were extirpated as a direct result of energy development (Walker et al. 2007, Walker 2008, Naugle et al. *In press*). Based on these studies, the BLM determined that a 2-mile timing limitation is insufficient to reverse the population decline.

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 fluid mineral development and WNv in the PRB area will continue to impact the local GSG population, causing further declines in lek attendance, and could result in local extirpation: "[f]indings reflect the status of a small remaining GSG population that has already experienced an 82% decline within the expansive energy fields (Walker et al. 2007a), a level of impact that has severely reduced options for delineating core areas that are large enough and in high enough quality habitats to sustain populations." (Taylor et al. 2012).

Current well densities reduced the function of PRB core areas, affecting all of the remaining active leks within core (Taylor et al. 2012). Continued energy development around the core areas will continue to degrade their remaining value. Declines in active leks and male attendance indicate that the WNv outbreaks and energy development reduce GSG populations and that they interact to exacerbate population declines. The effects of one WNv outbreak year could cut a population in half. Absent a WNV outbreak, or another stochastic event of similar magnitude, immediate extirpation in the PRB 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).

A timing limitation does nothing to mitigate loss and fragmentation of habitat and changes in disease mechanisms. Rather than limiting mitigation to only timing restrictions, more effective mitigation strategies may include, at a minimum, burying power lines (Connelly et al. 2000b); minimizing road and well pad construction, vehicle traffic, and industrial noise (Lyon and Anderson 2003, Holloran 2005); and managing produced water to prevent the spread of mosquitoes with the potential to vector WNv in GSG habitat (Walker et al 2007). Walker et al. (2007) recommend maintaining extensive stands of sagebrush habitat over large areas (at least one mile in size) around leks to ensure GSG persistence. The size of such a no-development buffer would depend on the amount of suitable habitat around the lek and the population impact deemed acceptable. Connelly et al. (2000) recommended locating all energy-related facilities at least 2 miles from active leks.

Several guidance documents are available that recommend practices that would reduce impacts of development on GSG. These include *Northeast Wyoming Sage-Grouse Conservation Plan* (Northeast

Wyoming Sage-grouse Working Group 2006), *Sage-Grouse Habitat Management Guidelines for Wyoming* (Bohne et al. 2007), *Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats* (WGFD 2009), *Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy* (USDI 2004), and *Greater Sage-Grouse Comprehensive Conservation Strategy* (Stiver et al. 2006).

4.7.6.3. Mitigation Effects

In order to reduce the likelihood that activities associated with noise, construction, and human disturbance, BLM will implement a timing limitation on all surface-disturbing activities in GSG habitat except for the 3 wells proposed on Pad #2 because the location is within 0.6 mile of a main overhead transmission line and a major highway (avoidance areas for GSG). 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 operator has minimized fragmentation to GSG habitat by drilling 9 wells from 3 well pads.

4.7.6.4. Residual Effects

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

4.7.7. Special Status (Sensitive) Species (SSS)

BLM will support the SSS policy (BLM Manual 6840). BLM Manual 6840.22A states that "The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species categories are no longer necessary, and future listings under special status species categories would not be necessary." The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-265.

4.7.7.1. Direct and Indirect Effects

The PRB FEIS discussed the impacts to bald eagles, pp. 4-251 to 4-253. No known eagle nests or winter roost sites are within 1 mile of the proposed project area.

4.7.7.2. Cumulative Effects

The PRB FEIS discussed the cumulative effects for bald eagles, pp. 4-251 to 4-253. Interstate highway I-90 travels through the middle of the project, which may provide some of the prey base (carrion along road side) for bald eagles that winter in the area.

4.7.7.3. Mitigation Measures

BFO recommends applying no further mitigation measures.

4.7.7.4. Residual Effects

None identified.

4.8. West Nile Virus

4.8.1. Direct and Indirect Effects

This project is not likely to result in standing surface water.

4.8.2. Cumulative Effects

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

4.8.3. Mitigation Measures

BFO recommends applying no mitigation measures and there should be no residual effects.

4.9. Cultural Resources

4.9.1. Direct and Indirect Effects

No historic properties will be impacted by the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the BLM electronically notified the Wyoming State Historic Preservation Officer (SHPO) on June 22, 2012 that no historic properties exist in the area of potential effect (APE). If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the Standard COA (General)(A)(1).

4.9.2. Cumulative Effects

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

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

4.9.3. Mitigation Measures

If operators observe any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS and ROD)] during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

When a project is constructed in an area with a high potential for buried cultural material, archaeological monitoring is often included as a COA. Construction monitoring is performed by a qualified archeologist working in unison with construction crews. If buried cultural resources are located by the archeologist,

construction is halted and the BLM consults with the SHPO on mitigation or avoidance. Due to the presence of alluvial and/or Aeolian deposits identified by the NRCS soil survey (NRCS n.d.), and areas of High to Very High Sensitivity Zones per the PUMP III Model (Eckerle 2005), the operator will be required to have an archeologist monitor all earth moving activities associated with certain construction, as described in the site specific COAs.

4.9.4. Residual Effects

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

4.10. Visual Resources Management

4.10.1. Direct and Indirect Effects

The visual resources will be impacted by construction of new access roads, pipelines, and the introduction of new wells to the area. Disturbance associated with access roads, pipelines, and power lines will create linear contrasts with the natural lines and the constructed well pads will contrast with the natural forms. However, considering the presence of other modifications (fences, existing wells, powerlines, etc.), the impact is expected to be minor. Adherence with BLM applied mitigation (in the form of COAs) addressing these visual contrasts should reduce visual resource impacts to the Jo POD and keep the POD within the visual resource management Class III requirements.

4.10.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS and FCPA RMPA. For details on expected cumulative impacts, refer to the PRB FEIS, p. 4-314 and FCPA RMPA, p. 4-103.

4.10.3. Mitigation Measures

DEP will mount lights at compressor stations on a pole or building at the minimum necessary height and direct them downward to illuminate key areas within the facility while minimizing the amount of light projected outside the facility.

Access roads must follow natural contours as closely as possible and will avoid approaching public roads at a perpendicular angle to prevent direction of the attention of a casual observer.

To maintain esthetic values, all semi-permanent and permanent facilities may require painting or camouflage to blend with the natural surroundings. All permanent above-ground structures (e.g., production equipment, tanks, etc.) not subject to safety requirements will be painted to blend with the natural color of the landscape. The paint used will be a color which simulates “Standard Environmental Colors.” Temporary structures (i.e. generators, etc.) present for more than 90 days will be required to comply with visual resource mitigation. The color selected for Jo POD is Covert Green, 18-0617 TPX.

5. CONSULTATION/COORDINATION:

BLM consulted or coordinated with the following on this project:

Contact	Organization	Onsite Presence?
Mary Hopkins	WY SHPO	No

List of Preparers (BFO unless otherwise noted)

Position/Organization	Name	Position/Organization	Name
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LIE	Lois Jenkins	Grazing Management	NA
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APPENDIX A. Affected Resource List, Sensitive Species Worksheet

Table A.1. Affected Resources Worksheet

Resource	Resource Present	Resource Affected	PRB FEIS Sufficient	Notes
Air quality	Yes	Yes	Yes	See PRB FEIS 3-291, 3-298, 4-404-4-406, 4-377, 4-386.
Cultural	Yes	Yes	No	Analyze in EA.
Native American religious concerns	No	No	No	Analyze in EA.
Traditional Cultural Properties	No	No	No	Analyze in EA.
Mineral Potential	-	-	-	See PRB FEIS 3-66, 3-70, 3-230, 4-127 through 4-129.
Coal	Yes	No	Yes	See PRB FEIS 3-66.
Fluid Minerals	Yes	Yes	Yes	See PRB FEIS 3-68, 3-69.
Locatable Minerals	Yes	No	Yes	Analyze in EA.
Other leasables	Yes	No	Yes	
Salable minerals	Yes	Yes	Yes	
Paleontology				See PRB FEIS 3-65-66, 4-125-127.
PFYC 3	-	-	-	
PFYC 5	-	-	-	
Rangeland management	Yes	Yes	Yes	
Existing range improvements	NA	NA	NA	
Proposed range improvements	NA	NA	NA	
Realty	No	No	NA	
Recreation	Yes	Yes	Yes	See PRB FEIS 3-263, 3-273, 4-319 -4-328.
Developed site	No	No	NA	See PRB FEIS 3-266, 4-326.
Walk-in-Area (2009 data)	No	No	NA	
Social & Economic	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-275-3-289, 4-336-4-370.
Soils & Vegetation	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-80-3-107, 4-134-4-152, 4-153-4-164, 4-343-4-391, 4-406.
Erosion Hazard	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-82, 4-35.
Poor Reclamation Potential	Yes	Yes	No	Analyze in EA.
Slope hazard	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-81, 4-135.
Forest products	Yes	Yes	Yes	

Table A.1. Affected Resources Worksheet

Resource	Resource Present	Resource Affected	PRB FEIS Sufficient	Notes
Invasive Species	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-103-3-108, 4-153.
Wetlands/Riparian	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-108-3-111, 4-172-4-178, 4-406, 4-395-4-396.
Special Designations	No	NA	NA	
Proposed ACEC	No	NA	NA	
Wild & Scenic River	No	NA	NA	
Wild Lands/Wilderness	No	No	No	DOI Order 3310, BLM 6301 & 6302
WSA	No	NA	NA	
Visual Resources	Yes	No	Yes	See PRB FEIS 3-252-3-263, 4-302-4-314, 4-403.
Class II	No			
Class III	Yes	Yes	Yes	Class IV bordered by Class III.
Water	Yes			
Floodplains	Yes	Yes	Yes	See PRB FEIS 3-1-3-56, 4-1-4-122, 4-135, 4-393, 4-405; ROD (A32), Vol. 1 (3-108 to 113).
Groundwater	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-1-3-30, 4-1-4-69, 4-392, 4-405; ROD pg 7&8 (App. D), Vol.1 (3-1 to 36).
Surface water	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-36-3-56, 4-69-4-122, 4-393, 4-405; ROD pg 7&8 (App. D) (App. A pg 30 to 310, Vol.1 (3-36 to 56).
Drinking water	Yes	Yes	Yes	PRB ROD pp. 7&8 (App. D), (pp. 3-1 to 56).
Wildland Urban Interface	No			
Wildlife	Yes	Yes	No	
ESA listed, proposed, or candidate species	Yes	Yes	No	Analyze in EA. Sage-grouse would be affected by this proposal and would require thorough analysis of effects including cumulative effects.
BLM sensitive species	Yes	Yes	No	Analyze in EA. See attached sensitive species wildlife checklist.
General wildlife	Yes	Yes	No	Analyze in EA. No aquatics section needed.
West Nile virus potential	Yes	Unlikely	Yes	

Table A.2. Special Status (Sensitive) Species (SSS) Worksheet

Common Name	Habitat	Habitat Present?	Individual Presence	Project Effects	Direct, Indirect, and/or Cumulative Impacts Anticipated Beyond the Level Analyzed within the PRB FEIS?
Amphibians					**4-258**
Northern leopard frog	Beaver ponds and cattail marshes from plains to montane zones.	No	NS	NI	No
Columbia spotted frog	Ponds, sloughs, small streams, and cattails in foothills and montane zones. Confined to headwaters of the S Tongue R drainage and tributaries.	No	NP	NI	No
Fish					**4-259 & 4-260**
Yellowstone cutthroat trout	Cold-water rivers, creeks, beaver ponds, and large lakes in the Upper Tongue sub-watershed	No	NP	NI	No
Birds					**4-260 to 4-264**
Baird's sparrow	Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground.	No	NS	MIIH	No
Bald eagle	Mature forest cover often within one mile of large water body with reliable prey source nearby.	No	NS	MIIH	No 4-251 to 4-253 & BA
Brewer's sparrow	Sagebrush shrubland	Yes	NS	MIIH	No
Ferruginous hawk	Basin-prairie shrub, grasslands, rock outcrops	No	NP	NI	No
Loggerhead shrike	Basin-prairie shrub, mountain-foothill shrub	Yes	NS	MIIH	No

Table A.2. Special Status (Sensitive) Species (SSS) Worksheet

Common Name	Habitat	Habitat Present?	Individual Presence	Project Effects	Direct, Indirect, and/or Cumulative Impacts Anticipated Beyond the Level Analyzed within the PRB FEIS?
Long-billed curlew	Grasslands, plains, foothills, wet meadows	Yes	NS	MIIH	No
Mountain plover	Short-grass prairie with slopes < 5 percent	No	NP	NI	4-254, 4-255 & BA; EA treatment required
Northern goshawk	Conifer and deciduous forests	No	NP	NI	No
Peregrine falcon	Cliffs	No	NP	NI	No
Sage sparrow	Basin-prairie shrub, mountain-foothill shrub	Yes	NS	NI	No
Sage thrasher	Basin-prairie shrub, mountain-foothill shrub	Yes	NS	MIIH	No
Trumpeter swan	Lakes, ponds, rivers	No	NP	NI	No
Western Burrowing owl	Grasslands, basin-prairie shrub	Yes	NP	NI	No
White-faced ibis	Marshes, wet meadows	No	NP	NI	No
Yellow-billed cuckoo	Open woodlands, streamside willow and alder groves	No	NP	NI	No
Mammals					**4-264 &4-265**
Black-tailed prairie dog	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	Yes	NP	NI	No
Fringed myotis	Conifer forests, woodland chaparral, caves and mines	Yes	S	NI	No
Long-eared myotis	Conifer and deciduous forest, caves and mines	Yes	S	NI	No
Spotted bat	Cliffs over perennial water.	No	NP	NI	No
Swift fox	Grasslands	Yes	S	MIIH	No

Table A.2. Special Status (Sensitive) Species (SSS) Worksheet

Common Name	Habitat	Habitat Present?	Individual Presence	Project Effects	Direct, Indirect, and/or Cumulative Impacts Anticipated Beyond the Level Analyzed within the PRB FEIS?
Townsend's big-eared bat	Caves and mines.	No	NP	NI	No
Plants.					**4-258**
Limber pine	Mountains, associated with high elevation conifer species	No	NP	NI	No
Porter's sagebrush	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5,300-6,500 ft.	No	NP	NI	No
William's wafer parsnip	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6,000-8,300 feet.	No	NP	NI	No

- **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.

Effect Determinations

Sensitive Species

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

Appendix A. Table A.3. Summary of Sensitive Species Habitat and Project Effects Associated with Alternative B

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Amphibians				
Northern leopard frog (*Rana pipiens*)	Beaver ponds and cattail marshes from plains to montane zones.	NS	NI	Habitat is not present.
Columbia spotted frog (*R*anus pretiosa)	Ponds, sloughs, small streams, and cattails in foothills and montane zones. Confined to headwaters of the S Tongue R drainage and tributaries.	NP	NI	The project area is outside the species' range, and the species is not expected to occur .
Fish				
Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*)	Cold-water rivers, creeks, beaver ponds, and large lakes in the Upper Tongue sub-watershed	NP	NI	The project area is outside the species' range, and the species is not expected to occur.
Birds				
Baird's sparrow (*Ammodramus bairdii*)	Shortgrass prairie and basin-prairie shrubland habitats; plowed and stubble fields; grazed pastures; dry lakebeds; and other sparse, bare, dry ground.	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.	S	MIIH	Bald eagles are not likely to use the few mature trees in the project area for nesting or winter roosting. Surface disturbing and maintenance activities may impact foraging eagles and the species may avoid the area.
Brewer's sparrow (*Spizella breweri*)	Sagebrush shrubland	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	NS	NI	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.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
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	NS	NI	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Mountain Plover	Short-grass prairie with slopes < 5%	NS	NI	A small prairie dog town is located within 0.25 miles of the project. However, the town is inactive and vegetation height and topography in the area preclude use by plovers.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NP	NI	Habitat not present.
Peregrine falcon (*Falco peregrinus*)	Cliffs	NP	NI	Habitat not present.
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	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	S	MIIH	Nesting and foraging habitat may be impacted by dust, noise, human activities, and direct loss. Species may avoid area.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	NP	NI	Habitat not present.
Western Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	NP	NI	A small prairie dog town is located within 0.25 miles of the project. The town is inactive and no burrowing owls have been previously located using the area. 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				

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Black-tailed prairie dog (*Cynomys ludovicianus*)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	NP	NI	A small prairie dog town is located within 0.25 miles of the project. However, the town is inactive. If the town becomes active in the future, prairie dogs may be negatively impacted by dust and noise associated with the production phase of development.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Swift fox (*Vulpes velox*)	Grasslands	NP	NI	Although suitable habitat is present, a lack of abundant prey source reduces the likelihood that foxes will occur.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	NP	NI	Habitat not present.
Plants				
Limber Pine (*Pinus flexilis*)	Mountains, associated with high elevation conifer species	NP	NI	Habitat not present.
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NP	NI	Project area outside of species' range.

Presence

K - Known, documented observation within project area.
S - Habitat suitable and species suspected, to occur within the project area.
NS - Habitat suitable but species is not suspected to occur within the project area.
NP - Habitat not present and species unlikely to occur within the project area.

Project Effects

NI - No Impact.
MIIH - May Impact Individuals or Habitat, but will not likely contribute to a trend towards Federal listing or a loss of viability to the population or species.
WIPV - Will Impact Individuals or Habitat with a consequence that the action may contribute to a trend towards Federal listing or cause a loss of viability to the population or species.
BI -Beneficial Impact