

DECISION RECORD
Yates Petroleum Corporation Custer Deep Master Development Plan (MDP), Bighorn Deep MDP,
Iroquois Federal Com #1FH
Environmental Assessment (EA), WY-070- EA15-202
Bureau of Land Management, Buffalo Field Office, Wyoming

The BLM approves Yates Petroleum Corporation’s Custer Deep MDP, Bighorn Deep MDP, Iroquois Federal Com #1FH gas and oil well application for permit to drill (APD) described in Alternative B of the environmental assessment (EA) WY-070-EA15-202 This approval includes the wells’ support facilities.

Compliance. This decision complies with or supports:

- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701).
- Mineral Leasing Act of 1920 (MLA) (30 U.S.C. 181); including the Onshore Oil and Gas Orders.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- National Historic Preservation Act of 1966 (NHPA) (16 USC 470).
- Powder River Basin Oil and Gas Project Final Environmental Impact Statement (FEIS) (2003).
- Buffalo Resource Management Plan (RMP) (2015).

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

Table 1. Well Sites. BLM approves 6 APDs and support facilities at the following locations:

Well Name	TwN	Rng	Sec	Qtr/Qtr	Surface Ownership	Surface Hole Lease	Bottom Hole Lease
Zuni Federal Com 1FH	42N	74W	17	SESE	Fee	Fee	Fee/Federal
Custer Federal Com 16FH	42N	74W	20	NENW	Fee	Federal	Federal
Custer Federal Com 19FH	42N	74W	20	NENE	Fee	Fee	Federal
Bighorn Federal Com 17FH	42N	74W	29	NENW	Fee	Federal	Federal
Bighorn Federal Com 18FH	42N	74W	29	NENE	Fee	Federal	Federal
Iroquois Federal Com 1FH	42N	74W	17	NENW	Fee	Federal	Federal

*BLM’s Instruction Memorandum No. 2009-078 entitled Processing Oil and Gas Applications for Permit to Drill for Directional Drilling into Federal Mineral Estate from Multiple-Well Pads on Non-Federal Surface and Mineral Estate Locations will apply to the proposal (COA’s are only recommended)

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

THE FINDING OF NO SIGNIFICANT IMPACT (FONSI). Analysis of Alternative B of the EA, WY-070-EA15-202 and the FONSI (incorporated here by reference) found Yates’ proposal for Custer Deep MDP, Bighorn Deep MDP, and the Iroquois Federal Com #1FH will have no significant impacts on the human environment, beyond those described in the PRB FEIS. There is no requirement for an EIS.

COMMENT OR NEW INFORMATION SUMMARY. BLM publically posted the APDs for 30 days, received no comments, and then internally scoped them. There are no new policies or information received post analysis that affects this project.

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

1. BLM and Yates included design features and mitigation measures (conditions of approval (COAs)) to reduce environmental impacts while meeting the BLM’s need. For a complete description of all site-specific COAs, see the COAs.

- a. The proposed development is outside priority Greater Sage-grouse habitat.
 - b. With application of Standard Operating Procedures (SOPs), applied mitigation, Required Design Features (RDFs), and COAs identified for Greater Sage-Grouse under the proposed action, impacts caused by surface-disturbing and disruptive activities would be minimized. RDFs were analyzed, even though, they are not required within general habitat. Lined cuttings pits will not present a West Nile virus risk to Greater Sage-Grouse. The pits will have steep sides, be lined, and of a temporary nature; the pits will not provide suitable mosquito breeding habitat.
 - c. There are no conflicts anticipated or demonstrated with current uses in the area.
2. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.
 3. The operator committed to:
 - Comply with the approved APDs, 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.
 4. The operator certified it has a surface access agreement.
 5. The project lacks wilderness characteristics. A wilderness characteristics inventory was completed in 2013; no lands with wilderness characteristics were identified outside the Big Horn Mountains. The inventory is available at: <http://www.blm.gov/wy/st/en/programs/Planning/rmps/buffalo/docs.html>.
 6. These APDs are (is) pursuant to the Mineral Leasing Act for developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390.

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

Field Manager: /s/ Duane W. Spencer

Date: November 24, 2015

FINDING OF NO SIGNIFICANT IMPACT
Yates Petroleum Corporation Custer Deep Master Development Plan (MDP), Bighorn Deep MDP,
Iroquois Federal Com #1FH
Environmental Assessment (EA), WY-070- EA15-202
Bureau of Land Management, Buffalo Field Office, Wyoming

FINDING OF NO SIGNIFICANT IMPACT (FONSI). Based on the information in the EA, WY-070-EA15-202, which BLM incorporates here by reference; I find that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those addressed in the Powder River Basin (PRB) Oil and Gas Project Final Environmental Impact Statement (FEIS) (2003); (2) Alternative B conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (2015); 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.

CONTEXT. Mineral development is a common PRB land use, sourcing over 42% of the nation's coal. The PRB FEIS foreseeable development analyzed the development of 54,200 oil and gas wells. The additional development analyzed in Alternative B is insignificant in the national, regional, and local context.

INTENSITY. The implementation of Alternative B will result in beneficial effects in the forms of energy and revenue production however; there will also be adverse effects to the environment. Design features and mitigation measures included in Alternative B will reduce 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 as identified in the 2003 PRB FEIS, the 2015 RMP, or other legislative or regulatory processes. BLM used relevant scientific literature and professional expertise in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to oil and gas development. Research findings on the nature of the environmental effects have minor controversy, are not highly uncertain, or do not involve unique or proven risks. The PRB FEIS predicted and analyzed oil development of the nature proposed with this project and similar projects. The selected alternative does not establish a precedent for future actions with significant effects. The proposal may relate to the PRB Greater Sage-Grouse and its habitat decline having cumulative significant impacts; yet this project is within the parameters of the impacts in the PRB FEIS. There are no cultural or historical resources present that will be adversely affected by the selected alternative. No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected. The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

Field Manager: /s/ Duane W. Spencer

Date: November 24, 2015

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA15-202
Yates Petroleum Corporation
Custer Deep Master Development Plan (MDP), Bighorn Deep MDP, Iroquois Federal Com #1FH
Bureau of Land Management, Buffalo Field Office, Wyoming

1. INTRODUCTION

BLM provides an EA for Yates Petroleum Corporation Custer Deep MDP, Bighorn Deep MDP, and Iroquois Federal Com #1FH oil and gas well applications for permit to drill (APD). BLM's jurisdiction for this proposal is fee (non-federal) surface - overlying fee and federal minerals, draining federal minerals in the horizontal at the bottom hole within either the Shannon B or Frontier rock formations. This site-specific analysis tiers into and incorporates by reference the information and analysis in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS), WY-070-02-065, 2003, and the PRB FEIS Record of Decision (ROD) per 40 CFR 1508.28 and 1502.21. One may review these documents at the BLM Buffalo Field Office (BFO) and on our website:

http://www.blm.gov/wy/st/en/field_offices/Buffalo.html. These APDs are pursuant to the Mineral Leasing Act for the purpose of exploring or developing oil or gas and do not satisfy the categorical exclusion directive of the Energy Policy Act of 2005, Section 390.

1.1. Background

BLM received the 6 Applications for Permit to Drill from Yates Petroleum Corporation (Yates) on March 25, March 27 and March 19, 2015. BLM conducted the on-site visit to meet with Yates and the private surface landowners to review the proposed project site conditions on June 17, 2015. The project post on-site APD deficiency letter was sent out on July 2, 2015. On July 15, 2015, Yates submitted new APD POD books to replace the name of the well Zuni Fed Com #2FH to the Iroquois Fed Com #1FH.

On August 20, 2015 Yates submitted deficiency responses for the APDs minus the landowner and water well agreements for the Nine Mile Ranch properties. Two timeline extensions from Onshore Order #1 guidelines for deficiency responses were granted to Yates to provide the landowner and water well agreement certificates. The first extension date was September 18, 2015 and the second date was September 30, 2015. On September 30, 2015, the operator followed up with an additional deficiency response that was specific to land owner surface use and water well agreements.

1.2. Need for the Proposed Project

BLM's need for this project is to determine whether, how, and under what conditions to support the Buffalo Resource Management Plan's (RMP) goals, objectives, and management actions with allowing the exercise of the operator's conditional lease rights to develop fluid minerals on federal leases. BLM incorporates by reference here, the APD information (40 CFR 1502.21). Conditional fluid mineral development supports the BFO RMP (2015) and the Mineral Leasing Act of 1920, the Federal Land Policy Management Act (FLPMA), and other laws and regulations.

1.3. Decision to be Made

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

1.4. Scoping and Issues

BLM posted the proposed APDs for 30 days and will timely publish the EA, any finding, and decision on the BFO website. This project is similar in scope to other fluid mineral development the BFO analyzed. External scoping is unlikely to identify new issues, as verified with recent fluid mineral EAs that BLM

externally scoped. External scoping of the horizontal drilling in Anadarko Petroleum’s Crazy Cat East EA, WY-070-EA13-028, 2013, generated 3 comments, and revealed no new issues.

The BFO interdisciplinary team (ID team) conducted internal scoping by reviewing the proposal to identify potentially affected resources, land uses, resource issues, regulations, and site-specific circumstances. The APDs and associated plans as well as the AR are available for review at the BFO. This EA will not discuss resources and land uses that are not present, not affected, or that the PRB FEIS or other analyses adequately addressed. This EA addresses the project’s 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.

2. PROPOSED PROJECT AND ALTERNATIVES

2.1. Alternative A – No Action

The no action alternative would deny these APDs requiring the operator to resubmit APDs that comply with statutes and the reasonable measures in the PRB FEIS Record of Decision (ROD) in order to lawfully exercise conditional lease rights. Fluid mineral development could continue on state and private leases. The PRB FEIS considered a no action alternative, pp. 2-54 to 2-62.

2.2. Alternative B Proposed Action (Proposal)

Overview. Yates requests BLM’s approval for 6 APDs from 6 pads and supporting infrastructure: see Table 1. The Proposal is to explore for, and possibly develop oil and gas reserves in the Shannon B and Frontier Formations at total vertical depths varying from 9,929 to 14,697 feet for the Shannon B and 11,536 to 16,037 feet for the Frontier. The project sites are located approximately 18 miles SW of the town of Wright, Campbell County, Wyoming. Elevations at the well heads vary from 5,177 to 5,367 feet above sea level. The topography has gently sloped draws rising to mixed sagebrush and grassland uplands. Ephemeral tributaries of the Belle Fourche River, Cheyenne River, and Bates Creek drain the area. The climate is semi-arid with an average annual precipitation of 10-14 inches, 60% of which occurs between April and September.

Table 2.1. Well Sites:

Well Name	Twn	Rng	Sec	Qtr/Qtr	Surface Ownership	Surface Hole Lease	Bottom Hole Lease
Zuni Federal Com 1FH	42N	74W	17	SESE	Fee*	Fee	Federal
Custer Federal Com 16FH	42N	74W	20	NENW	Fee	Federal	Federal
Custer Federal Com 19FH	42N	74W	20	NENE	Fee*	Fee	Federal
Bighorn Federal Com 17FH	42N	74W	29	NENW	Fee	Federal	Federal
Bighorn Federal Com 18FH	42N	74W	29	NENE	Fee	Federal	Federal
Iroquois Federal Com 1FH	42N	74W	17	NENW	Fee	Federal	Federal

*BLM’s Instruction Memorandum No. 2009-078 entitled Processing Oil and Gas Applications for Permit to Drill for Directional Drilling into Federal Mineral Estate from Multiple-Well Pads on Non-Federal Surface and Mineral Estate Locations will apply to the proposal (COA’s are only recommended)

Drilling, Construction and Production Design Features Include:

Access

- Access to the proposed well locations is provided from Archibald Road and State Highway 387 on to existing crown, ditched and surfaced roads.
- Existing graveled roads will be improved as needed to meet BLM road standards.
- All roads will be maintained to BLM standards during the entire life of the project area.

- During interim reclamation the ditches will be seeded with either a BLM or landowner approved seed mix to prevent erosion and maintain topsoil viability.
- Yates is proposing 0.2 miles of new access road with 65 feet wide disturbance corridor. An additional 1.5 miles of existing road to be upgraded to BLM road standards if needed. The road running surface will be 18-20 feet wide, with full ditches and reclaimable cut/fill slopes. Running surfaces will be flared to 100 feet wide at the pad entrance, flared to 60 feet wide at the intersections with the existing access, and up to 45 feet wide running surface on the corners so large trucks can navigate safely.
- Road turnouts will be 100 feet by 10 feet with 25 foot transitions and will be constructed as needed.
- Yates proposes to potentially install a 3 inch diameter poly line along the surface for a combined distance of 8.3 miles for a drilling and completion water supply to all six wells. Yates also proposes to utilize water trucks to bring water to the well sites from State permitted private and municipal sources. Water supply sources and transport methods are defined in the SUP.

Well Locations

- The well pad locations for production are proposed with the fill and cut slopes reduced to at least a 2:1 slope or back to original contour, by pushing fill material back up into the cut.
- The six proposed pads are estimated to have an initial total ground disturbance of 42.5 acres with an average of 7 acres per pad location.
- The wells will utilize a lined reserve pit at the pad to hold drill cuttings and drilling waste fluids.
- No staging areas, man camps/housing facilities are anticipated to be used off-site. Working trailers and sleeping trailers will be placed on the well pads during the drilling and completion of the wells.
- If the wells become producers, production facilities will be located at the well sites and will include pumping units, storage tanks, buildings, oil-water separators (heater-treaters). There will be no pits at these producing well locations after the drilling pits are reclaimed.
- Dikes will be constructed completely around the production facilities. The dikes will be constructed of corrugated steel, approximately 3 feet high, and hold the capacity of the largest tank plus 10%. The load-out line will be outside of the diked areas. A drip barrel or “Getty Box” will be installed under the end of the load-out lines.

Drilling and Completion Operations

- Hydraulic fracturing (HF) operations are planned as a “plug and perf” operation done in stages. All production and drilling water is to be either piped via surface line or trucked to the site from State of Wyoming permitted sources as identified in the Surface Use Plan (SUP).
- Completion flow back water will be held in tanks on location and trucked to a disposal facility permitted by the Wyoming Department of Environmental Quality (WDEQ) and identified in the SUP.
- Yates anticipates 60 days to drill the well with a well completion within 90 days from the start of operations for each well.
- Yates anticipates 80,000 barrels of water will be hauled or piped to the pad location for drilling and completion activities for each well. Water will be stored in the drilling pit or in temporary tanks on the pad location.
- A detailed completion operations plan is outlined in the SUP.

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

Additionally, the operator, in their APDs, committed to:

- Comply with the approved APD, applicable laws, regulations, orders, and notices to lessees.
- Obtain necessary permits from agencies.
- Offer water well agreements to the owners of record for permitted wells.

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

Table 2. Disturbance Summary for Custer Deep, Bighorn Deep, Iroquois Fed Com #1FH:

Facility	Total Length (Ft)	Total Width (Ft)	Acres Disturbance
Well Locations	1360.6	1360.6	42.5
Buried Electric on Crown and Ditched Roads	8631	150	14.9
Other Buried Electric	2528	85	1.6
Existing Crown and Ditch Road	8027	70	6.5
Proposed Surface Water Line	44682	6	2.1
Total Surface Disturbance			67.6 Acres

The reasonably foreseeable activity (RFA) for this and adjacent areas includes oil and gas exploration on 640 acre spacing and possible 320 acre spacing for horizontal oil wells and 80 acre spacing for vertical coal bed natural gas (CBNG) wells. The RFA in this project analysis area consists of 123 proposed notices of staking (NOS's) and APDs. The project analysis area is within 5 miles of these proposed wells. Potential APD submittals or RFA included in this analysis could consist of multiple wells on an existing pad or tie into existing supporting infrastructure: tank batteries, pipelines, power lines, and transportation networks.

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

This proposal does not diverge from the goals and objectives in the Buffalo Resource Management Plan (RMP) (2015), and generally conforms to the terms and conditions of that land use plan, and laws including the Clean Air Act, 42 USC 7401-7671q (2006), the Clean Water Act, 33 USC 1251 et seq. (1972), etc.

3. AFFECTED ENVIRONMENT

This section briefly describes the physical and regulatory environment that may be affected by the alternatives in Section 2, or where changes in circumstances or regulations occurred since adoption of analyses to which the EA tiers or incorporates by reference. The PRB FEIS considered a no action alternative (pp. 2-54 to 2-62) in evaluating a development of up to 54,200 fluid mineral wells.

There are 15,121 producing oil and gas wells in the PRB, Wyoming Oil and Gas Conservation Commission (WOGCC) December, 2014. The total number of conventional wells in the Buffalo planning area is 2,855, which includes 845 horizontal wells (federal, fee, and state) (as of December 2014). This represents 89% of the projected 3,200 in the 2003 PRB ROD. This agrees with the PRB FEIS which analyzed the reasonably foreseeable development of 51,000 CBNG and 3,200 natural gas and oil wells.

Table 3.1. NEPA Analyses Which BLM Incorporates by Reference either as similar drilling analyses or as substantially similar analyses.

#	Project Name	Operator	NEPA Analysis #	# / Type Wells	Approved Mo/Yr/Update
1 ^a	Mufasa Fed 11-31H	Lance	WY-070-EA12-062	1 Oil	3/2012
2 ^b	Crazy Cat East	Anadarko	WY-070-EA13-028	24+/- Oil Pads	2/2013
3	Sahara POD	Lance	WY-070-EA13-72	21Oil	3/2013

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

- a. While not overlapping, incorporate those sections describing and analyzing hydraulic fracturing, its supporting analysis, and the Greater Sage-grouse Section 3.7.12 and 4.8.2.
- b. While not overlapping, incorporate those sections describing and analyzing hydraulic fracturing and its supporting analysis to include but not limited to traffic, water, and air quality.

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) (available at http://www.blm.gov/wy/st/en/programs/energy/Coal_Resources/PRB_Coal/prbdocs.html) 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 “unclassified/attainment” with all ambient air quality standards. It is also in an area that is in prevention of significant deterioration zone. PRB air quality is a rising concern due to PRB-area air quality alerts issued in 2011-2014 for particulate matter (PM), attributed to coal dust.

Four sites monitor the air quality in the PRB: Cloud Peak in the Big Horn Mountains, Thunder Basin northeast of Gillette, Campbell County south of Gillette, and Gillette. In addition, the Wyoming Air Resource Monitoring System (WARMS) measures meteorological parameters from 9 sites throughout the State, and particulate concentrations from 5 of those sites, monitors speciated aerosol (3 locations), and evapotranspiration rates (1 location). The sites monitoring air quality for the Powder River Basin are located at Sheridan, South Coal Reservoir, Buffalo, Fortification Creek, and Newcastle. The northeast Wyoming visibility study is ongoing by the Wyoming Department of Environmental Quality (WDEQ). Sites adjacent to the Wyoming PRB-area are at Birney on the Tongue River 24 miles north of the Wyoming-Montana border, Broadus on the Powder River in Montana, and Devils Tower.

Existing air pollutant emission sources in the region include:

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

3.2. Soils and Ecological Sites

Project area soils are a combination of loams to sandy loams developed in alluvium weathered from sandstone and shale. Lithology consists of light to dark yellow and tan siltstone, sandstones and shale resulting in a wide variety of surface and subsurface textures. The project area average useable topsoil depths are approximately 6-8”.

Soil baseline characterization for the project area is based on SSURGO database review and analyses and site specific onsite investigations. SSURGO is the most detailed level of soil mapping done by the USDA NRCS. Soils in the project area were identified from the Campbell County Survey Area, Wyoming (WY605). The NRCS performed the survey using National Cooperative Soil Survey standards. The BLM uses SSURGO soil survey information to predict soil behavior, limitations, and suitability for a given action. The BLM’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.

Table 3.2 presents a tabulated summary of the soil map units impacted by the proposed MDP or well, ecological site, and predicted acres with percentage of area of interest disturbed. For the Custer Deep MDP there are three well locations, the Bighorn Deep MDP has two well locations, and the Iroquois Federal Com #1FH contains one well location in this soil and ecological site description.

Table 3.2. Dominant Soils and Ecological Sites in the Proposal Area

Well/MDP	Map Unit	Map Unit Name	Ecological Sites	Acres (%)
Custer Deep	113	Bidman-Ulm loams, 0-6 % slopes	Loamy & Sandy	14.7 (55%)
Custer Deep	158	Hiland-Bowbac fine sandy loams, 6-15% slopes	Loamy & Sandy	6.3 (24%)
Bighorn Deep	146	Forkwood-Cushman loams, 0-6% slopes	Loamy & Sandy	8 (44%)
Bighorn Deep	158	Hiland-Bowbac fine sandy loams, 6-15% slopes	Loamy & Sandy	9 (50%)
Iroquois Federal Com #1FH	217	Theedle-Shingle loams, 3-30% slopes	Loamy	6 (71%)

See the NRCS Soil Survey WY605, Campbell County (SSURGO) data for more detailed soil information. Ecological Site Descriptions (ESD's) include additional site-specific soil information.

The Loamy (Ly 10-14) Ecosite occurs on gently undulating rolling land and landforms of hill sides, alluvial fans, ridges and stream terraces.

The soils of this site are deep to moderately deep (greater than 20" to bedrock), well drained & moderately permeable. Layers of the soil most influential to the plant community varies from 3 to 6 inches thick. These layers consist of the A horizon with very fine sandy loam, loam, or silt loam texture and may also include the upper few inches of the B horizon with sandy clay loam, silty clay loam or clay loam texture.

The main soil limitations include low organic matter content and soil droughtiness. The low annual precipitation should be considered when planning a seeding.

The Sandy (Sy 10-14) Ecosite site occurs on nearly level to 50% slopes with landforms of alluvial fans, hillsides, plateaus, ridges & stream terraces.

The soils of this site are moderately deep (greater than 20" to bedrock) to very deep, well-drained soils that formed in alluvium or alluvium over residuum. These soils have moderate, moderately rapid, or rapid permeability. The surface soil will vary from 3 to 6 inches deep and have one of the following textures: fine sandy loam, sandy loam, or loamy very fine sand. Coarser topsoils may be included if underlain by finer textured subsoil. Layers of the soil most influential to the plant community vary from 3 to 6 inches thick.

The main soil limitations include depth to bedrock, low organic matter content, soil droughtiness, low water holding capacity, and high wind erosion potential. The low annual precipitation should be considered when planning a seeding.

For more detailed soil information, see the NRCS Soil Survey WY605.

Reclamation Suitability (Source Material)

Based on pre-disturbance evaluations of pad site soils and vegetation characteristics, the reclamation potential for the six pads was assessed. The assessment considered topsoil depth, slope, aspect, the texture of the primary soil series at the pad site, and site vegetation. All six of the well pad locations rate as having fair reclamation source material present in pre-disturbance condition. However, once

constructed the engineered pad areas are defined as Low Reclamation Potential (LRP) per Wyoming Reclamation Policy, and p. 4-143 and 4-149 of the PRB-EIS.

3.3. Ecological Sites and Vegetation

NRCS SSURGO data and onsite investigations identify site specific ecological sites and vegetation present. Ecological site descriptions provide site and vegetation information needed for resource identification, management, and reclamation recommendations. The ecological sites identified by the NRCS SSURGO for these well sites were a mixture of Loamy and Sandy in a 10-14 inch per year precipitation zone.

Within the Loamy Ecosite, the vegetation found was the Mixed Sagebrush/Grass Plant Community. Historically, this plant community evolved under grazing by bison and a low fire frequency. Currently, it is found under moderate, season-long grazing by livestock in the absence of fire or brush management. Wyoming big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grasses, and miscellaneous forbs.

Dominant grasses include needleandthread, western wheatgrass, and green needlegrass. Grasses of secondary importance include blue grama, prairie junegrass, and Sandberg bluegrass. Forbs commonly found in this plant community include plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Sagebrush canopy ranges from 20% to 30%. Fringed sagewort is commonly found. Plains pricklypear can also occur.

When compared to the Historic Climax Plant Community, sagebrush and blue grama have increased. Production of cool-season grasses, particularly green needlegrass, has been reduced. The sagebrush canopy protects the cool-season mid-grasses, but this protection makes them unavailable for grazing. Cheatgrass (downy brome) has invaded the site. The overstory of sagebrush and understory of grass and forbs provide a diverse plant community that will support domestic livestock and wildlife such as mule deer and antelope.

This plant community is resistant to change. A significant reduction of big sagebrush can only be accomplished through fire or brush management. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. If the herbaceous component is intact, it tends to be resilient if the disturbance is not long-term.

Within the Sandy Ecosite, the vegetation found was Needleandthread, Prairie sandreed Plant Community. The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores and is well suited for grazing by domestic livestock. Potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants. The state is a mix of warm and cool season midgrasses. The major grasses include needleandthread, prairie sandreed, little bluestem, and Indian ricegrass. Other grasses occurring in the state include rhizomatous wheatgrasses, Sandberg bluegrass, blue grama, and threadleaf sedge. Silver sagebrush and green rabbitbrush are conspicuous components of this state.

The state is stable and well adapted to the Northern Great Plains climatic conditions. The diversity in plant species allows for high drought resistance. This is a sustainable plant community (site/soil stability, watershed function, and biologic integrity).

BLM staff identified the dominant vegetation community types in the project area as a mixed grass prairie and sagebrush shrubland which varied at each well site. Some areas were a good mix of sagebrush and

native grasses as would be expected for the ecosites defined above, while other areas were devoid of sagebrush and native grasses, and instead were predominantly crested wheat grass..

3.4. Water Resources

WDEQ regulates Wyoming's water quality with EPA oversight. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting impoundments for the containment of the State's surface waters. The WOGCC has authority for permitting and bonding off channel pits located over state and fee minerals.

3.4.1. Groundwater

The area's historical use of groundwater was for stock or domestic water. A search of the WSEO Ground Water Rights Database showed 16 registered stock and domestic water wells within 1 mile of the proposed wells with depths from 8 to 603 feet. Refer to the PRB FEIS for additional information on groundwater, pp. 3-1 to 3-36. The 2004 EPA study found it unlikely that hydraulically fractured CBNG wells would contaminate ground water. The EPA has an expansive, on-going study looking at more aspects of hydraulic fracturing and has yet to issue findings. A 2011-2012 Geological Survey study found no groundwater effects from thousands of deep horizontally fractured oil and gas wells. Another study found no direct link between hydraulic fracturing and studied aquifers, Warner, 2012.

The Fox Hills, the deepest penetrated fresh water zone in the PRB lies well above the target formation at depths of 7,067 to 7,256 feet below surface and varies at each well.

3.4.2. Surface Water

The project area is in the Bates Creek drainage which is tributary to the Cheyenne River and All Night Creek which is tributary to the Belle Fourche River. Free flow of surface water has been altered with several on-channel stock ponds which collect and store surface water for use by livestock. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it receives water from alluvial groundwater, springs, or other surface source – PRB FEIS, Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank. See the PRB FEIS for a surface water quality discussion, pp. 3-48 to 3-49.

3.5. Wetlands/Riparian

Bates Creek and All Night Creek watersheds do contain some wetland/riparian areas as identified in the National Wetland Inventory ArcGIS database within the project area of the proposed wells. However, there are no wetlands/riparian areas identified within 500 feet of the proposed disturbances for the project and therefore should not be adversely impacted by this development. See the PRB FEIS for a wetlands/riparian discussion, pp. 3-108 to 3-113.

3.6. Invasive or Noxious Species

During the on-site review of the project area on June 17, 2015, we found Scotch thistle (*Onopordum acanthium* L), Canada thistle (*Cirsium arvense* L), cheatgrass (*Bromus tectorum*), and Japanese brome (*B. japonicus*), within or directly adjacent to land that will be disturbed in the construction of the well pads and roads for this project.

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

3.7. Fish and Wildlife

The Buffalo Field Office FEIS identified wildlife species occurring in the Buffalo planning area, vol 1 pp. 469 to 496. BLM performed a habitat analysis of the project area, and compared resource concerns with those identified by a third party consultant on behalf of the operator. 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 Buffalo Field Office FEIS, WY Game and Fish Department (WGFD) datasets, and the Wyoming Natural Diversity Database (WYNDD) to evaluate the affected environment for wildlife species that may occur in the area. A wildlife survey and habitat report was submitted by the operator which was performed by ICF International (ICF) during the 2015 survey season (see Administrative Record). Site specific information is described below for known species suspected to occur and become impacted beyond the analysis of the Buffalo FEIS 2015. Rationale for species not discussed in detail below can be referenced in the administrative record ((Table W.1.(Summary of Sensitive Species Habitat and Project Effects) and Table W.2. ((Summary of Threatened and Endangered Species Habitat and Project Effects)).

Land uses and other disturbances occurring within the proposed project area include, livestock grazing, ranching operations, overhead power lines, conventional oil and gas, and improved and unimproved roads. Habitats within the proposal are comprised of sagebrush grassland and mixed-grass prairie. The dominant vegetation is Wyoming big sagebrush and the understory is a mix of grasses (Japanese brome, needle and thread, bluebunch wheatgrass, smooth brome, western wheatgrass, Indian ricegrass, blue gramma, foxtail barley, threadleaf sedge, crested-wheatgrass and cheatgrass). The habitat is similar in nature to the habitats (sagebrush obligate migratory birds and Greater sage-grouse habitat) discussed in the Sahara POD EA, WY-070-EA13-72, incorporated here by reference.

3.7.1. Big Game

Pronghorn antelope and mule deer inhabit the project area. The Buffalo Field Office FEIS discussed the affected environment for pronghorn antelope (*Antilocapra americana*) and mule deer (*Odocoileus hemionus*) in Vol 1 on pp. 473 to 474 and pp. 474 to 476, respectively. No crucial winter range, parturition areas, or migration routes for these big game species overlap the project area (WGFD 2012); however, year-long range for pronghorn and mule deer are present at the proposed project area (WGFD 2012).

3.7.2. Raptors

The Buffalo Field Office FEIS discussed the affected environment for raptors in Vol 1 on pp. 486 to 491, and pp. 512 to 517 for those considered special status raptors (Birds of Prey). ICF biologists utilized the BLM raptor database, and conducted ground surveys in the project area in order to comprehensively depict the raptor situation in the area. In total, eleven raptor nests were identified as occurring in the project area. Species documented in the area in these eleven nests have been red-tailed hawks, Swainson's hawks, and ferruginous hawks. Two of the nests in the project area were active with Swainson's hawks in 2015 and three were no longer present. The remaining 6 nests were inactive. (ICF 2015) The affected environment for this proposal is similar to a recent approved project (Sahara POD) BLM analyzed. Therefore, the Sahara POD EA, WY-070-EA13-72 analysis is incorporated here by reference: Affected Environment (Section 3.7.2.1, p.15-17). Effects (Direct and indirect, Cumulative, Mitigation, and Residual, Section 4.6.2.1, pp. 28-31) to raptors from surface disturbing and disruptive activities associated with development of horizontal oil wells.

3.7.3. Migratory Birds

The Buffalo Field Office FEIS discussed the affected environment for migratory birds, Vol 1 pp. 491 to 493. The affected environment for migratory bird species that are considered special status species can be found in the Buffalo Field Office FEIS in Vol 1 pp. 517 to 522. Suitable habitat for migratory birds, including those listed as BLM sensitive species, is present throughout the proposal area.

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

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

GSG habitat has been documented in the proposal area (WYNDD). Sagebrush habitats in the area have been called marginal in terms of supporting GSG throughout the year, according to the project report submitted by ICF. The Buffalo Field Office FEIS discusses the affected environment for GSG in the special status species section found in Vol 1 pp. 502 to 512. The proposal is not within a Core Sage-grouse Area, as designated by the State of Wyoming. The project is not within 2 miles of any known active GSG leks. ICF conducted three surveys in April 2015 from the air, but failed to locate any leks. The closest known lek to the project boundary is the T-chair lek, 4.7 miles west. The affected environment for this proposal is similar to a recently approved project (Sahara POD) BLM analyzed. Therefore, the Sahara POD EA, WY-070-EA13-72 analysis is incorporated here by reference: Affected Environment (Section 3.7.4.1, p.18-19).

3.9. Cultural Resources

In accordance with section 106 of the National Historic Preservation Act, BLM must consider impacts to historic properties (sites that are eligible for or listed on the National Register of Historic Places (NRHP)). For an overview of cultural resources that are generally found within BFO the reader is referred to the *Draft Cultural Class I Regional Overview, Buffalo Field Office* (BLM 2010). A Class III (intensive) cultural resource inventory (BFO project # 70150062) was performed in order to locate specific historic properties which may be impacted by the proposed project. Additionally, some of the project area was covered by previously reviewed and accepted Class III inventories (BFO project #s 70030048, 7004019) No cultural resources are located in the proposed project area.

4. ENVIRONMENTAL EFFECTS

Alternative A -No Action Alternative. BLM analyzed the no action alternative as Alternative 3 in the PRB FEIS and it subsequently received augmentation of the effects analysis in this EA through the analysis of mineral projects, their approval, and construction; and through the analysis and approval of other projects. This updated the no action alternative and cumulative effects. The project area has surface disturbance from existing roads, well pads, and oil and gas facilities. Under the no action alternative, on-going well field operations would continue as would the development of fee wells. The production and the drilling and completion of these new wells would result in noise and human presence that could affect resources in the project area; these effects could include the disruption of wildlife, the dispersal of noxious and invasive weed species, and dust effects from traffic on unpaved roads. Present fluid mineral development in the PRB is under half of that envisioned and analyzed in the PRB FEIS. There is only a remote potential for significant effects above those identified in the PRB FEIS to resource issues as a result of implementing the no action alternative.

Alternative B, Proposed Action (Proposal)

4.1. Air Quality

In the project area, air quality impacts would occur during construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, as well as drilling rig and vehicle engine exhaust) and production (including well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. BLM incorporates by reference the analysis found in the August 2012 High Plains District Oil and Gas Lease Sale EA, WY-070-EA12-44, pp. 45-51 (air quality, greenhouse gas emissions, and visibility). Air quality impacts modeled in the PRB FEIS and Cumulative Air Quality Effects (2009) concluded that PRB projected fluid and solid development would not violate state, tribal, or federal air quality standards and this project is well within the projected development parameters. Adgate, et al.(2014) advanced a hypothesis that air and water quality effects from HF may negatively impact human

health but concluded that “major uncertainties” and a “paucity of baseline data” after drilling 153,260 wells since 2004. They called for more research funding.

4.2. Soils, Ecological Sites, and Vegetation

4.2.1. Direct and Indirect Effects

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

Construction Activities

The greatest impacts to the soil resources associated with this project would occur with the construction of the well pads and new roads. Construction of these requires grading and leveling, with the greatest level of effort required on more steeply sloping areas. These impacts would begin immediately as the soils would be subjected to grading and construction activities and impacts would continue for the term of operations. The duration and intensity of these impacts would vary according to the type of construction activity to be completed and the inherent characteristics of the soils to be impacted.

The proposed APDs require approximately a total of 70 acres of area disturbance for the wells, roads, and pipelines construction, of which there will be an estimated 42 acres total pad area disturbance to safely drill the proposed wells. During the construction and drilling phase of the project, the operator plans to maintain cut and fill slopes at 1½:1(67%), 2:1(50%) slopes. These constructed slopes will be bare ground void of vegetation thus identified as highly erosive to water and wind erosion. The predicted construction cut depth exceeds the identified soil depth, thus impacting soil horizons described as “little affected by pedogenic processes”, or unaltered parent material. The physical and chemical properties of this material may be variable and limiting in its potential to support plant growth, variable in erosion potential and suitability for construction material.

The well pad disturbance will be reduced with interim reclamation for the production phase. See the Master Surface Use Plan (MSUP) for full description of the planned reclamation. Cut slopes and fill slopes will be maintained at 2:1 and 3:1 respectively as per standard conditions of approval. Road running surface is 18-20 feet with the remaining right-of-way (ROW) to be re-contoured and seeded. The operator committed measures and attached mitigation measures listed below this section reduce the potential impacts to the soil resource to levels described in the PRB-FEIS.

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

4.2.2. Cumulative Effects

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

4.2.3. Mitigation Measures

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

1. The entire access road must be fully upgraded as described in the POD (including all water control structures such as wing ditches, culverts, relief ditches, turnouts, surfacing, etc.) and functional to BLM standards prior mobilizing the drilling equipment to the well location.
2. Re-contouring and interim reclamation will be initiated as soon as is practicable but not more than 6 months from the date of the well completion incorporating stored soil material into that portion of the well pad not needed for well production; exception(s) may be granted with sufficient justification.
3. Soil compaction will be remediated on all compacted surfaces and prior to the redistribution of topsoil on disturbed surfaces to the depth of compaction by methods that prevent mixing of the soil horizons. BLM's recommended methods are sub-soiling, para-plowing, or ripping with a winged shank. Scarification is acceptable on areas identified as very shallow or shallow soils.
4. A 30 day stabilization requirement from initial disturbance is applied to all wells and access/pipelines for the entire project. Stabilization BMPs include, but are not limited to; straw waddles, rock check dams, surface roughening, ditch and berms, erosion matting/blankets, seeding and mulching, and spraying tackifier on cut/fill slopes and topsoil/spoil piles.

4.2.4. Residual Effects

The PRB FEIS identified residual effects (p. 4-408). Residual effects across the project area would include a long-term loss of soil productivity associated with well pads and roads. Alteration of soils would result in the formation of new soil with different properties. Post disturbance productivity should be similar to pre-disturbance. In spite of the above residual effects, the BLM considers that Alternative B is within the parameters for surface disturbance and surface disturbance reclamation in PRB FEIS ROD.

4.3. Ecological Sites and Vegetation

4.3.1. Direct and Indirect Effects

The PRB FEIS discusses direct and indirect effects to ecological sites and vegetation (p. 4-153 to 4-164). The proposed action would impact the existing plant communities, species richness, diversity, and vegetation structure that occur on the site.

Other impacts anticipated to occur include those in the direct and indirect effects listed above under soils section. Direct effects to ecological sites would occur from ground disturbance caused by construction of well pads, associated pipelines, and roads. Short term effects would occur where vegetated areas are disturbed but later reclaimed within 1 to 3 years of the initial disturbance. Long-term effects would occur where well pads, compressor stations, roads, water-handling facilities or other semi-permanent facilities would result in loss of vegetation and prevent reclamation for the life of the project. Other impacts include a reduction in the utility of interim reclaimed areas because of reduced species and landscape diversity on reclaimed sites, increased soil erosion, and habitat loss for wildlife and livestock.

4.3.2. 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

The proponents operated committed measures and design features are sufficient to not warrant the application of site specific conditions of approval (COAs) additional to those identified under soils.

4.3.4. Residual Effects

Residual effects were identified in the PRB FEIS, p. 4-408. Residual effects include short term loss of vegetative cover during construction and interim reclamation and long-term vegetation loss on well locations and access roads.

The alteration of biodiversity of ecological sites could result from disturbance, alterations in vegetation in reclaimed areas, and the spread and establishment of weed species.

BLM developed a site specific seed mix for the proposed disturbance area. BLM can only require its use on BLM surface. The seed mix for non-federal surface is selected by the surface owner and may be designed to be more beneficial to cattle grazing than to soil stabilization. The result may be long term wind and water erosion on the soils with little or no re-vegetation success.

Successful interim reclamation should create a stable functioning ecosystem that prepares the sites for eventual final reclamation, which would reduce the residual effects of the proposed action. The BLM considers these residual effects from Alternative B with proposed well(s) are likely within the parameters for acceptable surface disturbance and surface disturbance reclamation in PRB FEIS ROD and Onshore Order Number 1.

4.4 Water Resources

4.4.1. Groundwater

4.4.1.1. Direct and Indirect Effects

Adherence to the standard 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.

Yates' drilling program provides additional protection for the Fox Hills formation. The depth of the Fox Hills Formation varies from 7,042 to 7,256 depending upon well location. The casing design and cement program includes centralizers on every joint of casing through the Fox Hills Formation to facilitate adequate cement covering. The volume of cement pumped is calculated to provide cement across the Fox Hill from 100 feet above to 100 feet below the aquifer. The operator will set surface casing at 2,950 feet to provide additional protection for shallow groundwater aquifers and coal zones.

Yates proposes to utilize WYDEQ permitted domestic and municipal water supply sources for the drilling and completion water needs. They anticipate they will use up to 80,000bbls of water per well. The water will either be transported to the sites via a temporary surface line or trucked to the site. Disposal of the waste water will be accomplished by trucking off site to permitted pits or injection well locations. The

SUP contains the locations and permits for source water, temporary transmission line route, and the disposal sites.

The cumulative industry and regulatory experience shows that thousands of wells pierce the nation's largest aquifer in western Texas, Oklahoma, and Kansas with essentially no direct or indirect impact to that groundwater, see, <http://www.spe.org/jpt/print/archives/2010/12/10Hydraulic.pdf>. Lastly, the EPA 2004 study and its on-going, detailed study of hydraulic fracturing yielded, thus far, no immediate cautions, concerns, or warnings that present industry and regulatory practices endanger ground water or require immediate changes.

4.4.1.2. Cumulative Effects

Yates 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, Yates

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.

4.4.1.3. Mitigation Measures

Adherence to the Drilling Plan, standard 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 target coal zone.

4.4.1.4. Residual Effects

Conformance with the identified mitigation measures will ensure that ground water will not be adversely impacted by well drilling and completion operations. No residual effects are anticipated.

4.5. Wetland/Riparian

4.5.1. Direct and Indirect Effects

Watershed values, including natural drainages, would not be unduly impacted by the proposal with properly applied mitigation. There are no wetlands/riparian areas identified within 500 feet of the proposed disturbances for the project and therefore should not be adversely impacted by this development. Also, the State of Wyoming Department of Environmental Quality requires soil disturbing activities over an acre to be permitted with a sediment control plan to insure sediment is not transported off site. Required mitigation will likely insure protection of the wetland riparian areas from this development. See the PRB FEIS for a wetlands/riparian discussion, pp. 3-108 to 3-113.

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 consistent with those described within the PRB FEIS. For more information on cumulative impacts, please refer to the PRB FEIS.

4.5.3. Mitigation Measures

Adherence to the SUP, Wyoming Department of Environmental Quality Storm Water regulations, and the project specific Conditions of Approval (COA's), should insure little to no impact to wetland and riparian habitat within the project area.

4.5.4. Residual Effects

No residual effects are anticipated if Yates conforms to the state and federal regulations applicable to the project construction and operation.

4.6. Invasive Species

4.6.1. Direct and Indirect Effects

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, applicant committed measures will reduce potential impacts from noxious weeds and invasive plants. The operator committed to the control of noxious weeds and species of concern using the following measures identified in their Integrated Pest Management Plan (IPMP): 1) Control Methods, including frequency; 2) Preventive practices; and 3) Education. For further information on the IPMP, refer to the SUP.

4.6.2. Cumulative Effects

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

4.6.3. Mitigation Measures

The proponents operated committed measures and design features are sufficient to not warrant the application of site specific conditions of approval.

4.6.4. Residual Effects

Cheatgrass (*Bromus tectorum*), various thistles (Canada, Scotch, wavy leaf) and to a lesser extent, Japanese brome (*B. japonicus*) exist in the affected environment. Required control efforts by the Operator would be limited to the surface disturbance associated with 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. Efforts are being made by BLM, USDA, WGFD and other partners to treat infestations beyond physically disturbed areas.

4.7. Fish and Wildlife

4.7.1. Big Game

4.7.1.1. Direct and Indirect Effects

The Buffalo Field Office FEIS discusses impacts to wildlife, including big game, from mineral resources development on pp. 1123 to 1124. Impacts to big game occur at varying levels through alterations in hunting, increased vehicle collisions, harassment and displacement, increased disturbance from noise and dust, changes to forage or forage availability, alterations to reproductive success, increased habitat fragmentation or degradation, or other factors that result in population declines. The Sublette Mule Deer Study (Phase II) found that mule deer avoidance around well pads and associated facilities was found to increase commensurate with the level of human activity in the area, while unmanned well pads were avoided less by comparison (Sawyer et al. 2009). Similarly, mule deer were found to avoid roadways with high levels of traffic, and showed an increased presence along roads with low to no use. As discussed in the PRB FEIS (p. 4-187), pronghorn are likely to exhibit similar avoidance behaviors to mule deer, and reduce their use of habitats within 1/8 mile of disturbance (Rost and Bailey 1979). The proposed wells occur in an area with existing wells and associated infrastructure, as well as human activity from maintenance and operations. The placement of well pads near existing disturbance limits potential impacts from development and human activity in new portions of the project area. Locating well pads in close proximity to existing disturbance, though not necessarily specifically considered as part of the initial pad placement, minimizes habitat fragmentation. While disturbance is occurring, the juxtaposition of the existing disturbance and proposed is preferable. The placement of well pads near existing disturbance limits potential impacts from development when compared to human activity in less developed areas.

4.7.1.2. Cumulative Effects

Non-federal actions, in conjunction with the federal development may compound impacts to big game. In particular, mule deer populations are depressed across the West, with severe drops in areas of high oil and gas development. Refer to the Buffalo Field Office FEIS for cumulative impacts to wildlife species, including big game, in Vol 2 pp. 1167.

4.7.1.3. Mitigation Measures

The proposal is not within crucial winter range, nor a migration route, nor a parturition area. The BLM proposes no additional mitigation.

4.7.2. Raptors

4.7.2.1. Direct and Indirect Effects

The Buffalo Field Office FEIS discusses impacts to wildlife, including raptors, from mineral resources development on pp. 1123 to 1124.

4.7.2.2. Cumulative Effects

Existing and reasonably foreseeable conventional oil development in the PBR would affect raptor populations due to increased human activity and fragmentation of foraging habitat. Refer to the Buffalo Field Office FEIS for cumulative impacts to wildlife species, including raptors, in Vol 2 pp. 1167.

4.7.2.3. Mitigation Measures

To reduce the risk of decreased productivity or nest failure, the BLM BFO will require a species specific timing limitation for surface disturbing activities during the breeding season around active/biologically important raptor nests..

4.7.2.4. 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. A decline in the breeding population of raptors within the area may occur.

4.7.3. Migratory Bird

4.7.3.1. Direct and Indirect Effects

The Buffalo Field Office FEIS discusses impacts to wildlife, including migratory birds, from mineral resources development on pp. 1123 to 1124. Impacts to migratory birds will be similar to those described in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.2.2.1, pp. 31-33, incorporated here by reference.

4.7.3.2. Cumulative Impacts

Refer to the Buffalo Field Office FEIS for cumulative impacts to wildlife species, including migratory birds, in Vol 2 pp. 1167.

4.7.3.3. Mitigation Measures

Where applicable, construction of the proposals (vegetation removal) will occur outside of the breeding season (May 1- July 31) since suitable nesting habitat for sagebrush obligates is present. This restriction will apply to habitat removal, unless a pre-construction nest search (within 10 days of construction planned May 1-July 31) is completed. If surveys will be conducted, the operator will follow “2013 Sagebrush BLM Sensitive Migratory Bird Nest Search Protocol” found at the following web address: http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html.

Migratory birds will be effectively excluded from all facilities that pose a mortality risk, including, but not limited to, heater treaters, flare stacks, and secondary containment where escape may be difficult or wildlife toxicants are present.

4.7.3.4. Residual Effects

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

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

4.8.1. Greater Sage-Grouse

The Buffalo Field Office FEIS discusses impacts to wildlife, including migratory birds, from mineral resources development on pp. 1123 to 1124. Effects (Direct and indirect, Cumulative, Mitigation, and Residual) to GSG from surface disturbing and disruptive activities associated with development of horizontal oil wells were analyzed in the Sahara POD EA, WY-070-EA13-72, 2013, Section 4.6.4.1, pp.

34-37, incorporated here by reference. Activities associated with development of this project are anticipated to be similar in nature, with the following additional site-specific information. The project area does not overlap any Wyoming core or connectivity Sage-grouse areas, nor is it within 2 miles any lek. Construction of the well pads and associated infrastructure will cause fragmentation of sagebrush stands and result in the direct loss of an estimated 67.6 acres of marginal GSG habitat (see above, Table 2.2. Disturbance Summary). Noise and human disturbance associated with roads, construction, drilling, and completion will be disruptive to GSG. Implementation of the project will adversely impact year-long habitat, both through direct loss of suitable habitats and avoidance of the area by GSG due to fragmentation and anthropogenic activity.

4.8.2. Mitigation Measures

Sage-grouse specific mitigation is not warranted for this project location because the project is within the parameters of Wyoming's core population area strategy and the 2015 BFO RMP. With the application of Standard Operating Procedures (SOP's), Best Management Practices(BMP's), applied mitigation for other wildlife species, required design features and conditions of approval, impacts to Greater Sage-Grouse impacts caused by surface-disturbing and disruptive activities would be minimized.

4.9. Cultural Resources

4.9.1. Direct and Indirect Effects

BLM policy states that a decision maker's first choice should be avoidance of historic properties (BLM Manual 8140.06(C)). If historic properties cannot be avoided, mitigation measures must be applied to resolve the adverse effect. No historic properties will be impacted by the proposed project. Following the State Protocol Between the Wyoming Bureau of Land Management State Director and The Wyoming State Historic Preservation Officer, Section V(E)(iv), the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 10/23/2015 that no historic properties exist within the area of potential effect (APE). If any cultural values (sites, features or artifacts) are observed during operation, they will be left intact and the Buffalo Field Manager notified. If human remains are noted, the procedures described in Appendix L of the PRB FEIS must be followed. Further discovery procedures are explained in Standard COA (General)(A)(1) and in Appendix K of the Wyoming Protocol.

4.9.2. Cumulative Effects

Cumulative impacts to special status species were discussed in the Buffalo Field Office FEIS on pp. 1228 to 1229. 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 oil and gas developments 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 Office Manager notified. Standard COA (General)(A)(1) further explains discovery procedures.

4.9.4. Residual Effects

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

5. CONSULTATION/COORDINATION:

BLM Consulted or Coordinated with the Following on this Analysis; OSP (Onsite Presence):

Contact	Organization	OSP?	Contact	Organization	OSP?
Mary Hopkins	WY SHPO	No			

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