

**DECISION RECORD  
FOR  
Yates Petroleum Corporation  
Lancer 1 POD  
ENVIRONMENTAL ASSESSMENT –WY-070-10248**

**DECISION:**

BLM’s decision is to approve Yates’ Lancer 1 Coal Bed Natural Gas (CBNG) POD Alternative B of the attached Environmental Assessment (EA). Alternative B is the Modified Proposed Action, and is the result of collaboration between the Bureau of Land Management and Yates Petroleum Corporation. Alternative B has been analyzed in the attached EA and found to have no significant impacts on the human environment, beyond those described in the Powder River Basin Final Environmental Impact Statement (PRB FEIS) thus an EIS is not required.

Details of the approval are summarized below. The project description, including specific changes made at the onsites, and site-specific mitigation measures, is included in the attached EA, pp. 3-8.

**Well Sites:**

The following 10 Applications for Permit to Drill (APDs) and associated infrastructure are authorized:

	<b>Well Name</b>	<b>Well #</b>	<b>Qtr/Qtr</b>	<b>Sec</b>	<b>TWP</b>	<b>RNG</b>	<b>Lease #</b>
1	LANCER 1 DEVASTATOR CS	3	SWNE	26	44N	76W	WYW141237
2	LANCER 1 DEVASTATOR CS COM	1*	SWSE	23	44N	76W	WYW141237
3	LANCER 1 DEVASTATOR CS COM	2	SWSW	25	44N	76W	WYW141237
4	LANCER 1 DEVASTATOR CS COM	4	SWSE	26	44N	76W	WYW141237
5	LANCER 1 MIRACLE MAKER CS	1	NENE	22	44N	76W	WYW140806
6	LANCER 1 MIRACLE MAKER CS COM	2	SWNE	22	44N	76W	WYW140806
7	LANCER 1 TRAIN CS	1	NENW	22	44N	76W	WYW128618
8	LANCER 1 TRAIN CS	2	SWNW	22	44N	76W	WYW128618
9	LANCER 1 TRAIN CS	3	NESW	22	44N	76W	WYW128618
10	LANCER 1 TRAIN CS	4	SWSW	22	44N	76W	WYW128618

**Water Management:**

The following water management infrastructure was inspected and approved for use in association with this POD:

	<b>FACILITY Name / Number</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>	<b>Capacity (Acre Feet)</b>	<b>Surface Disturbance (Acres)</b>	<b>Lease #</b>
1	Close Encounter Pit	NESW	16	44N	76W	16.1	2.8	State
2	North Butte Injector Well #9	NESW	16	44N	76W	1 per day	0.62	Fee

**Deferrals:**

The following 4 APDs which are located in Section 15 of T42N, R76W and associated infrastructure are deferred until the identified deficiencies are satisfactorily addressed:

	<b>Well Name</b>	<b>Well #</b>	<b>Environmental Issue/Deficiency</b>	<b>Remedy</b>
1	LANCER 1 CS FEDERAL	5	WYW 153062 has a NSO Stipulation in Section 15 to protect Bald Eagle roost site.	Waiver from Wyoming State Office/pending onsite visit
2	LANCER 1 CS FEDERAL	8	WYW 153062 has a NSO Stipulation in Section 15 to protect Bald Eagle Roost site.	Waiver from Wyoming State Office/pending onsite visit
3	LANCER 1 CS FEDERAL	9	WYW 153062 has a NSO Stipulation in Section 15 to protect Bald Eagle Roost site.	Waiver from Wyoming State Office/pending onsite visit
4	LANCER 1 CS FEDERAL	10	WYW 153062 has a NSO Stipulation in Section 15 to protect Bald Eagle Roost site.	Waiver from Wyoming State Office/pending onsite visit

The operator requested that the BLM Wyoming State Office waive (permanently remove) the lease stipulation for Lease 153062, which has a NSO (No Surface Occupancy) Stipulation in Section 15 to protect a Bald Eagle roost site. Per Onshore Order #1, XI. *Waivers, Exceptions, or Modifications*, a request to waive should also include information demonstrating that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or that the proposed operation would not cause unacceptable impacts. If the BLM Wyoming State Office (WSO) denies the waiver, the wells will be denied. If the WSO grants the waiver, then the Buffalo Field Office will complete the APD process, including the onsite.

**Operator Committed Measures:**

The operator has incorporated several measures to alleviate resource impacts into their Master Surface Use Plan (MSUP), submitted on June 25, 2010 and July 16, 2010. Refer to the MSUP pages 1 through 18, for complete details of operator committed measures.

**Site-specific Mitigation Measures:**

Site-specific Conditions of Approval have been applied to this project, in addition to the programmatic and standard COAs identified in the PRB FEIS, to mitigate the site-specific impacts described in the Environmental Consequences section of the attached EA. For a complete description of all site-specific COA's associated with this approval, see the COA document in the attached EA.

Lancer 1 POD is located within 2 miles of the base of the North Butte of Pumpkin Buttes, which has been designated a Traditional Cultural Property (TCP). There is a Programmatic Agreement (PA) between BLM and Wyoming State Historic Preservation Officer (SHPO) regarding mitigation of adverse effects to the Pumpkin Buttes TCP from anticipated federal minerals development. Site specific mitigation measures have been developed for adherence to this PA.

**COMPLIANCE WITH LAWS, REGULATIONS, LAND USE PLANS, AND POLICIES:**

This approval is in compliance with all Federal laws, regulations, and policies. This includes, but is not limited to, the Federal Land Policy and Management Act, the National Historic Preservation Act, the Threatened and Endangered Species Act, the Migratory Bird Treaty Act, the Clean Water Act, the Clean Air Act, and the National Environmental Policy Act.

Approval of this alternative is in conformance with the *Powder River Basin Oil and Gas Project Environmental Impact Statement and Proposed Plan Amendment (PRB FEIS)*, *Record of Decision and Resource Management Plan Amendments for the Powder River Basin Oil and Gas Project (PRB FEIS ROD)*, and the Approved Resource Management Plan (RMP) for the Public Lands Administered by the Bureau of Land Management, Buffalo Field Office (BFO), (1985/2001).

This approval is subject to adherence with all of the operating plans, design features, and mitigation measures contained in the Master Surface Use Plan of Operations, Drilling Plan, Water Management Plan, and information in individual APDs. This approval is also subject to operator compliance with all mitigation and monitoring requirements contained within the Powder River Oil and Gas Project Final Environmental Impact Statement and Resource Management Plan Amendment (PRB FEIS) approved April 30, 2003.

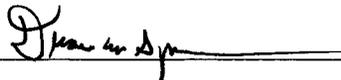
**RATIONALE:**

The decision to authorize the selected alternative, as summarized above, is based on the following:

1. Mitigation measures were included to reduce environmental impacts below the level of significance (FONSI) while still meeting the project's purpose and need. Mitigation is discussed in the environmental consequences section (4.2) of the attached EA. For a complete description of all site-specific COA's associated with this approval, see section Appendix A in the attached EA.
2. The selected alternative will not result in any undue or unnecessary environmental degradation.
3. The selected alternative will help meet the nation's energy needs, and help stimulate local economies by maintaining workforce stability.
4. The Operator, in their POD, has committed to:
  - Comply with all applicable Federal, State, and Local laws and regulations (MSUP pg. 13).
  - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits (MSUP pg. 3).
  - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD (MSUP pg. 10).
  - Provide water analysis from a designated reference well in each coal zone (WMP pg. 5).
5. The Operator has certified that a Surface Use Agreement has been reached with the Landowners (MSUP pg. 13).
6. The selected alternative incorporates components of the Wyoming Governor's Sage Grouse Implementation Team's "core population area" strategy, the Governor's executive order, and local research to provide mitigation for sage-grouse, while meeting the purpose and need for the Lancer 1 POD Project.

**ADMINISTRATIVE REVIEW AND APPEAL:** Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any 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.

Any party who is adversely affected by the State Director's decision may appeal that decision to the Interior Board of Land Appeals, as provided in 43 CFR 3165.4.

Field Manager:  Date: 9/15/10

**FINDING OF NO SIGNIFICANT IMPACT  
FOR  
Yates Petroleum Corp  
Lancer 1 POD  
ENVIRONMENTAL ASSESSMENT –WY-070-10248**

**FINDING OF NO SIGNIFICANT IMPACT:**

On the basis of the information contained in the EA, and all other information available to me, it is my determination that: (1) the implementation of Alternative B will not have significant environmental impacts beyond those already addressed in PRB FEIS to which the EA is tiered; (2) Alternative B is in conformance with the Buffalo Field Office Resource Management Plan (1985, 2001); and (3) Alternative B does not constitute a major federal action having a significant effect on the human environment. Therefore, an environmental impact statement or a supplement to the existing environmental impact statement is not necessary and will not be prepared.

This finding is based on my consideration of the Council on Environmental Quality's (CEQ) criteria for significance (40 CFR '1508.27), both with regard to the context and to the intensity of the impacts described in the EA.

**CONTEXT:**

Mineral development (coal, oil and gas, bentonite, and uranium) is a long-standing and common land use within the Powder River Basin. More than one fourth of the nation's coal production comes from the Powder River Basin. The PRB FEIS reasonably foreseeable development predicted and analyzed the development of 51,000 CBNG wells and 3,200 oil wells (PRB FEIS ROD pg. 2). The additional CBNG development described in Alternative B is insignificant within 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 (EA sec. 4). Design features and mitigation measures have been included within Alternative B to prevent significant adverse environmental effects (EA sec. 2.2).

The preferred alternative does not pose a significant risk to public health and safety. The geographic area of the POD does not contain unique characteristics identified within the 1985 RMP, 2003 PRB FEIS, or other legislative or regulatory processes.

Relevant scientific literature and professional expertise were used 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.

CBNG development of the nature proposed with this POD and similar PODs was predicted and analyzed in the PRB FEIS; the selected alternative does not establish a precedent for future actions with significant effects.

There are no cultural or historical resources present that will be adversely affected by the selected alternative (EA sec. 4.2.4). No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected (EA sec. 4.2.2.). 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 Office Manager: *Shane M. Dyer*

Date: 9/15/10

**BUREAU OF LAND MANAGEMENT  
BUFFALO FIELD OFFICE  
ENVIRONMENTAL ASSESSMENT (EA)  
FOR  
Yates Petroleum Corporation  
Lancer 1 POD  
COALBED NATURAL GAS PLAN OF DEVELOPMENT  
WY-070-10248**

## **1. INTRODUCTION**

This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Powder River Basin Oil and Gas Project Environmental Impact Statement and Resource Management Plan Amendment (PRB FEIS), #WY-070-02-065 (approved April 30, 2003), pursuant to 40 CFR 1508.28 and 1502.21. This document is available for review at the BLM Buffalo Field Office (BFO). This project environmental assessment (EA) addresses site-specific resources and impacts that were not covered within the PRB FEIS.

### **1.1. Background**

Yates Petroleum Corporation submitted the Lancer 1 POD on 12/24/08 with 17 Federal APD's.

- In February of 2009, a Programmatic Agreement (PA) was signed between BLM and Wyoming State Historic Preservation Officer (SHPO) regarding mitigation of adverse effects to the Pumpkin Buttes Traditional Cultural Property (TCP) from anticipated federal minerals development in Campbell County, Wyoming. Lancer 1 POD is located within 2 miles of the base of the North Butte of Pumpkin Buttes.
- Lease WYW153062 has a NSO (No Surface Occupancy) Stipulation for all of Section 15 for the purpose of protecting Bald Eagle winter roost sites. The operator has submitted a letter to the Wyoming State Office requesting a waiver to this NSO stipulation. BLM informed the operator on 4/26/10 that four wells proposed in Section 15 of lease WYW153062 would not be looked at during the 5/5/10 onsite pending the outcome of the WSO waiver request.
- The operator informed the BLM on 4/26/10 that operating rights for three (3) proposed Lancer 1 POD wells in Section 27 were traded to Anadarko Petroleum and included in Dry Willow V POD. The Zeke CS 5, Zeke CS 6, and Zeke CS 7 were withdrawn by Yates from the operator's proposal.
- Onsite visits were conducted in 2010 on May 5 to evaluate the proposal and modify as necessary to alleviate environmental impacts.
- BLM sent a post-onsite deficiency letter on 5/17/10.
- The project proposal and APDs were considered complete when BLM received the operator's response to the post onsite deficiencies on 6/25 and 7/16/10.
- Proposed COAs were shared with the operator on 8/27/10.

### **1.2. Purpose and Need for the Proposed Action**

The purpose of the proposed action is to explore, develop and produce oil and gas reserves conducted under the rights granted by a Federal oil and gas lease, as required in 43 CFR 3160, all Onshore Orders, and The Mineral Leasing Act, as amended and supplemented, (30 U.S.C. 181 et seq.).

The need for the action is the requirement to obtain approval for the development of an Oil and Gas Lease through an Application for Permit to Drill (APD) on public lands managed by the Bureau of Land Management under Onshore Order No. 1, pursuant to the authority of the Mineral Leasing Act, as amended and supplemented, (30 U.S.C. 181 et seq.) and prescribed in 43 CFR Part 3160.

### **1.3. Decision to be Made**

Decision to be Made: The BLM will decide whether or not to approve the proposed development of oil and gas resources on the federal leasehold, and if so, under what terms and conditions.

### **1.4. Conformance with Land Use Plan and Other Applicable Laws, Regulations, and Policies**

The proposed action conforms to the terms and the conditions of the 1985 Buffalo RMP and the 2003 PRB FEIS & RMP Amendment. The proposed action is in compliance with all Federal laws, regulations, and policies. This includes, but is not limited to, the Federal Land Policy and Management Act (1976), the National Historic Preservation Act, the Endangered Species Act (1973), the Migratory Bird Treaty Act (1918), the Clean Water Act (1972), the Clean Air Act (1970), and the National Environmental Policy Act (1969).

### **1.5. Scoping and Issues**

External scoping was not conducted for this EA. Extensive external scoping was conducted for the PRB FEIS and is discussed beginning on pg. 15 of the ROD and beginning on pg. 2-1 of the FEIS. This action is similar in scope to the numerous other CBNG PODs that BFO has analyzed; external scoping would be unlikely to identify new issues as was verified by the few POD EAs that were externally scoped such as the Clabaugh POD (WY-070-EA08-134) and Hollcroft/Stotts Draw POD (WY-070-EA07-021).

The BLM interdisciplinary team (ID team) conducted internal scoping by reviewing the proposed development and project location to identify potentially affected resource and land uses. Appendix B identifies those resources and land uses present and affected by the proposed action; those resources and land uses that are either not present, not affected, or were adequately covered by the PRB FEIS will not be discussed in this EA. The ID team identified significant issues for the affected resources to further focus the analysis. This EA addresses those site-specific impacts that were not disclosed within the PRB FEIS that would help in making a reasoned decision or may be related to a potentially significant effect. Issues for this project include:

- Soils and vegetation: site stability, reclamation potential, and invasive species
- Wildlife: raptor productivity, mountain plover, bald eagles, greater sage-grouse lek occupancy and persistency
- Cultural: National Register eligible sites, Pumpkin Buttes Programmatic Agreement (PA).
- Water: Significant water issues were disclosed and adequately covered within the PRB FEIS.
- Social and Economic: revenue potential, local economics.

Because Lancer 1 POD is located within 2 miles of the base of the North Butte of Pumpkin Buttes, all stipulations of the Programmatic Agreement (PA) between BLM and Wyoming State Historic Preservation Officer (SHPO) regarding mitigation of adverse effects to the Pumpkin Buttes Traditional Cultural Property (TCP) are applied to the Lancer 1 POD project. The site specific mitigation measures this project is required to adhere to are located in Appendices A through G of the PA. These mitigation measures incorporate standard BMPs to reduce visual contrast and are incorporated during all phases (drilling, construction, operation, reclamation) of all wells and their associated infrastructure. Appendices A through G of the Pumpkin Buttes PA are SITE SPECIFIC MITIGATION MEASURES WHICH ADDRESS:

- SURFACE RECLAMATION
- ACCESS ROADS
- GATHERING PIPELINES
- WELL LOCATIONS
- POWER LINES

- WATER DISCHARGE
- OTHER FACILITIES

A copy of the Pumpkin Buttes PA including Appendixes A through G is attached as Appendix C in this EA document.

In addition, a VCR (Visual Contrast Rating) analysis was performed on all proposed surface disturbance within 2 miles of the Pumpkin Buttes TCP boundary as required by the Pumpkin Buttes Programmatic Agreement (PA). This analysis as described *BLM Handbook H-8431-1, Visual Resource Contrast Rating*, determines the potential visual impacts from the proposed surface disturbing activities by comparing the project features with the major features in the existing landscape using basic design elements of form, line, color, and texture. A Visual Contrast Rating of moderate or better is acceptable under the Pumpkin Buttes PA. Because the Lancer 1 project adheres to the mitigation and COAs described in this PA, full consultation between the BLM, SHPO, and tribes is not necessary.

## 2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

Two alternatives, A and B, were evaluated. A brief description of each alternative is included in the following sections. Programmatic Mitigation Measures, as determined in PRB FEIS Record of Decision apply to all alternatives, including the No Action Alternative (Alternative A of this EA), and are included in Appendix A of this EA. Standard Mitigation Measures, Operator-committed Mitigation Measures, and site-specific Conditions of Approval (COAs) would apply only to action alternatives (Alternative B of this EA) and also are included in Appendix A.

### 2.1. Alternative A - No Action

A No Action Alternative was considered in the PRB FEIS, Volume 1, pages 2-54 through 2-62. This alternative would consist of no new federal wells. An oil and gas lease grants the lessee the “right and privilege to drill for, mine, extract, remove, and dispose of all oil and gas deposits” in the lease lands, “subject to the terms and conditions incorporated in the lease.” Thus, under this alternative, the operator’s proposal would be denied.

### 2.2. Alternative B - Modified Proposed Action

Alternative B contains complete APDs and is based on the operator and BLM working to reduce environmental impacts. This alternative summarizes the POD as it was finally, after site visits, submitted to the BLM by Yates Petroleum Corporation on 6/25/10 and 7/17/10.

Proposed Action Title/Type: Yates Petroleum Corporation’s Lancer 1 CBNG POD.

Proposed Well Information: There are 14 wells proposed within this POD, four of which have been deferred until the identified deficiencies have been addressed. The wells are vertical bores proposed on an 80 acre spacing pattern with 1 well per location. Each well will produce from the Big George coal seams. Proposed well house dimensions are 10 ft wide x 10 ft length x 4 to 8 ft height. Well house color is Covert Green, selected to blend with the surrounding vegetation. Proposed and deferred wells are included in Table 2.1 below.

**Table 2.1 Proposed Wells – Alternative B**

	Well Name	Well #	Qtr/Qtr	Section	TWP	RNG	Lease #
1	LANCER 1 DEVASTATOR CS	3	SWNE	26	44N	76W	WYW141237

	Well Name	Well #	Qtr/Qtr	Section	TWP	RNG	Lease #
2	LANCER 1 DEVASTATOR CS COM	1*	SWSE	23	44N	76W	WYW141237
3	LANCER 1 DEVASTATOR CS COM	2	SWSW	25	44N	76W	WYW141237
4	LANCER 1 DEVASTATOR CS COM	4	SWSE	26	44N	76W	WYW141237
5	LANCER 1 MIRACLE MAKER CS	1	NENE	22	44N	76W	WYW140806
6	LANCER 1 MIRACLE MAKER CS COM	2	SWNE	22	44N	76W	WYW140806
7	LANCER 1 TRAIN CS	1	NENW	22	44N	76W	WYW128618
8	LANCER 1 TRAIN CS	2	SWNW	22	44N	76W	WYW128618
9	LANCER 1 TRAIN CS	3	NESW	22	44N	76W	WYW128618
10	LANCER 1 TRAIN CS	4	SWSW	22	44N	76W	WYW128618

**Deferrals:**

The following 4 APDs and associated infrastructure were proposed but deferred until the identified deficiencies are satisfactorily addressed:

	Well Name	Well #	Environmental Issue/Deficiency	Remedy
1	LANCER 1 CS FEDERAL	5	Lease has NSO Stipulation to protect Bald Eagle roost	Waiver WSO/pending onsite visit
2	LANCER 1 CS FEDERAL	8	Lease has NSO Stipulation to protect Bald Eagle roost	Waiver WSO/pending onsite visit
3	LANCER 1 CS FEDERAL	9	Lease has NSO Stipulation to protect Bald Eagle roost	Waiver WSO/pending onsite visit
4	LANCER 1 CS FEDERAL	10	Lease has NSO Stipulation to protect Bald Eagle roost	Waiver WSO/pending onsite visit

The operator requested that the BLM Wyoming State Office waive (permanently remove) the lease stipulation for Lease 153062, which has a NSO (No Surface Occupancy) Stipulation in Section 15 to protect a Bald Eagle roost site. Per Onshore Order #1, XI. *Waivers, Exceptions, or Modifications*, a request to waive should also include information demonstrating that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or that the proposed operation would not cause unacceptable impacts. If the BLM Wyoming State Office (WSO) denies the waiver, the wells will be denied. If the WSO grants the waiver, then the Buffalo Field Office will complete the APD process, including the onsite.

Water Management Proposal: Table 2.2 includes the water management infrastructures proposed for use in association with this POD.

**Table 2.2 Proposed Water Management Facilities – Alternative B**

	<b>FACILITY Name / Number</b>	<b>Qtr/Qtr</b>	<b>Secti on</b>	<b>TWP</b>	<b>RNG</b>	<b>Capacity (Acre Feet)</b>	<b>Surface Disturbance (Acres)</b>	<b>Lease #</b>
1	Close Encounter Pit	NESW	16	44N	76W	16.1	2.8	State
2	North Butte Injector	NESW	16	44N	76W	1 per day	0.62	State

County: Campbell

Applicant: Yates Petroleum Corporation

Surface Owners: T-Chair Ranch, Patricia Clark, Gene Mankin; Christensen Ranch, John Christensen

Drilling and Construction:

- Drilling of 10 total federal CNBG wells in the Big George, coal zone depths of approximately 1,769 feet. Ten well locations are to be drilled without constructed pads on locations with mowed vegetation.
- Drilling and construction activities are anticipated to be completed within two years, the term of an APD. Drilling and construction occurs year-round in the PRB. Weather may cause delays lasting several days but rarely do delays last multiple weeks. Timing limitations in the form of COAs and/or agreements with surface owners impose longer temporal restrictions on portions of this POD, but rarely do these restrictions affect an entire POD.
- Well metering shall be accomplished by telemetry and well visitation. Metering would entail 4 visits per month to each well.
- A Water Management Plan (WMP) that involves the following infrastructure and strategy: One existing discharge point to a lined and fenced off-channel emergency pit and one existing injection well within the Upper Powder River basin. All water produced in association with this project will be injected or fully contained within the emergency pit. No water will be discharged to the surface. The Injection well is permitted under General Permit with the Wyoming State Department of Environmental Quality, permit #5C5-2. The off-channel pit is covered under bond with the Wyoming Oil and Gas Conservation Commission (WOGCC).
- A road network consisting of 4.45 miles of improved road and 4.81 miles of primitive road.
- An above ground power line network to be constructed by a third party provider, Powder River Energy Corporation. The operator proposes to bury all power from the power drop locations to well sites. If the proposed route is altered, then the new route will be proposed via sundry application and analyzed in a separate NEPA action. Power line construction has not been scheduled and will not be completed before the CBNG wells are producing. If the power line network is not completed before the wells are in production, then temporary diesel generators shall be placed at the power drops, at a well location, or in an approved disturbance area.
- A storage tank of approximately 1000 gallon capacity shall be located with each diesel generator. Generators are projected to be in operation for 6 months. Fuel deliveries are anticipated to be once per week. Generator noise level is expected to be 95 decibels at 10 feet distance.
- A buried gas, water and power line network.

For a detailed description of design features, construction practices and water management strategies associated with the proposed action, refer to the Master Surface Use Plan (MSUP), Drilling Plan and WMP in the POD and individual APDs. Also see the subject POD for maps showing the proposed well locations and associated facilities described above. More information on CBNG well drilling, production and standard practices also is available in the PRB FEIS, Volume 1, pages 2-9 through 2-40 (January 2003).

Implementation of committed mitigation measures contained in the MSUP, Drilling Program and WMP, in addition to the Standard COAs contained in the PRB FEIS Record of Decision Appendix A, are incorporated and analyzed in this alternative.

### **2.3. Operator Committed Measures**

The operator has incorporated several measures to alleviate resource impacts into the Master Surface Use Plan (MSUP), submitted on 6/25/10 & 7/16/10. Refer to the MSUP pages 1 through 18 for complete details of operator committed measures. The MSUP is available for review as part of the Lancer 1 POD Administrative Record at the BLM Buffalo Field Office and include the following measures:

- To install pipeline the operator will utilize a boring procedure from the bottom of one (1) drainage sidewall in order to prevent disturbance on a slope greater than 25%.

Additionally, the Operator, in their POD, has committed to:

1. Comply with all applicable Federal, State and Local laws and regulations.
2. Obtain the necessary permits for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
3. Offer water well agreements to the owners of record for permitted water wells within 0.5 mile of a federal CBNG producing well in the POD
4. Provide water analysis from a designated reference well in each coal zone.
5. The Operator has certified that a Surface Use Agreement has been reached with the landowners.

### **2.4. Alternatives Considered but Not Analyzed in Detail**

- Four wells located in Section 15 have a NSO (No Surface Occupancy) lease stipulation and have been deferred. These wells were not looked at during the field onsite. The operator requested that the BLM Wyoming State Office waive (permanently remove) the NSO lease stipulation for Lease 153062 in Section 15 to protect a Bald Eagle roost site. Per Onshore Order #1, XI. *Waivers, Exceptions, or Modifications*, a request to waive should also include information demonstrating that the factors leading to its inclusion in the lease have changed sufficiently to make the protection provided by the stipulation no longer justified or that the proposed operation would not cause unacceptable impacts. If the BLM Wyoming State Office (WSO) denies the waiver, the wells will be denied. If the WSO grants the waiver, then the Buffalo Field Office will complete the APD process, including the onsite.
- During the planning process and at the onsite, efforts were made to corridor pipelines along existing access roads. In Lancer 1 POD there is 3.36 miles of pipeline in which it was not feasible to corridor pipelines along existing access roads. In many areas of the project the surface owner did not want pipelines corridorred with roads because of conflict with ranching operations. In one area of the project the operator was not permitted road access from one landowner's surface to another's.
- 1 well was relocated due to interference with the surface owner's landing airstrip.

- Per Pumpkin Buttes P.A. Appendix E, *within one mile of the base of the Pumpkin Buttes, power lines servicing wells will be buried.* Third party overhead power is anticipated within Sections 16 of the project area which is within one mile of the base of Pumpkin Buttes. However, all power Yates is proposing is underground. All power from the power drops (constructed by Yates) will be buried to each well. Yates does not propose or construct the overhead (primary service) to the project area.

## 2.5. Summary of Alternatives

A summary of the infrastructure currently existing within the POD area (Alternative A), the infrastructure proposed by the operator and BLM (Alternative B) working to reduce environmental impacts are presented in Table 2.3.

**Table 2.3 Summary of Alternatives**

**Figures within the action alternatives represent additional facilities and do not include the existing facilities.**

<b>Facility</b>	<b>Alternative A (No Action) Existing Number/ Acres/Miles</b>	<b>Alternative B (Modified Proposal) Proposed Number/ Acres/Miles</b>
Total CBNG Wells	15 existing	10
Well Locations Nonconstructed Constructed Slotted	3.74 ac	10 = 1.0 ac
Conventional Wells	2 = 1.10 ac	0
Gather/Metering Facilities Number of Facilities Acreage of Facilities	0	0
Compressors Number of Compressors	0	0
Number of Ancillary Facilities (Staging/Storage Areas)	0	0
Acres (Miles) of Template/ Spot Upgrade Roads No Corridor With Corridor	0 3.73 mi = 20.34 ac	0.55 mi = 2.67 ac 4.48 mi = 21.72 ac
Acres (Miles) of Engineered Roads No Corridor With Corridor	0	0.64 ac
Acres (Miles) of Primitive Roads No Corridor With Corridor	0.88 mi = 0.10 ac 0	0 2.83 mi = 10.98 ac
Miles of Buried Power No Corridor With Corridor	0	0 With pipelines along access
Miles of Pipeline Not within access		3.36 mi = 13.03 ac plus 3.60 ac widened in drainages
Miles of Overhead Powerlines	6.5 mi = 23.6 ac	1.06 mi = 3.85 ac (Third party)
Number of Communication Sites	0	0
Number of Monitor Wells	0	0
Acres of Land Application Disposal	0	0

<b>Facility</b>	<b>Alternative A (No Action) Existing Number/ Acres/Miles</b>	<b>Alternative B (Modified Proposal) Proposed Number/ Acres/Miles</b>
Acres of Subsurface Drip Irrigation	0	0
Number of Treatment Facilities	0	0
Number of Impoundments	1	0
On-channel	0	0
Off-channel		0
Lined	1(2.8 acres)	0
Unlined	0	0
Number of Injection Wells	1	0
Water Discharge Points	1	0
<b>TOTAL ACRES DISTURBANCE</b>	<b>51.68</b>	<b>57.49</b>

### 3. DESCRIPTION OF AFFECTED ENVIRONMENT

This section describes the environment that would be affected by implementation of the alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. A screening of all resources and land uses potentially affected is included in Appendix B. Resources that would be unaffected, or not affected beyond the level analyzed within the PRB FEIS, are not discussed within the EA.

Applications to drill were received on 12/24/08. Field inspections of the proposed Lancer 1 POD CBNG project were conducted on 5/5/2010. Personnel attending the field inspections are identified in section 5 Consultation and Coordination.

#### 3.1. Project Area Description

##### 3.1.1. Geologic Features and Mineral Resources

The project area is located approximately 40 miles south and west of Gillette, Wyoming, in Campbell County. The project area ranges in elevation from 4700 to 5000 feet above sea level. The topography varies from semi flat ridges, deeply incised draws, and occasional rock outcroppings. The project area extends onto a portion of North Butte to the north, a prominent topographic feature. North Middle Butte lies to the southeast. Willow Creek and Dry Willow Creek are ephemeral drainages and drain from east to west in the project area. Several more ephemeral draws, without names, are found throughout the area. Active uranium mining occurs adjacent to the project area. Potential uranium ore deposits have been identified within the project area. The area falls within a 10-14 inch precipitation zone, with most of the precipitation falling during late winter and spring.

##### 3.1.2. Land Ownership

Land ownership is private surface. There is no BLM surface located within the project boundaries.

##### 3.1.3. Land Use

Existing land uses in the project area include livestock grazing, coal-bed natural gas (CBNG) development, some conventional oil production, and adjacent in-situ uranium mining.

#### 3.2. Soils, Vegetation, and Ecological Sites

##### 3.2.1. Soils & Vegetation

Soils have developed in alluvium and residuum derived from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams. Soil surface and subsurface textures vary widely from clay loams to sands. Soil depths vary from deep on lesser slopes to

shallow and very shallow on steeper slopes. Soils are generally productive, though varies with texture, slope and other characteristics. Soils differ with topographic location, slope and elevation. Topsoil depths to be salvaged for reclamation range from 0 to 4 inches on ridges and miscellaneous areas such as “badlands” to 8+ inches in bottomland. Erosion potential varies from moderate to severe depending on the soil type, vegetative cover and slope. Reclamation potential of soils also varies throughout the project area. The main soil limitations in the project area include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes.

Soils within the project area were identified from the *South Campbell (WY605) and South Johnson (WY619) County Survey Areas, Wyoming*. The soil survey was performed by the Natural Resource Conservation Service according to National Cooperative Soil Survey standards. The BLM used county soil survey information to predict soil behavior, limitations, or suitability for a given activity or action. The agencies 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. Approximately 35% percent of the area within the boundary of the proposed action contains soil mapping units with a named soil component identified as being a highly erosive due to wind or water erosion, 5% of the area has slopes greater than 25%, making reclamation challenging if not impossible. These areas were avoided as per FEIS-ROD. Soils having poor reclamation suitability comprise 43% of the POD area. The proponent planned their project and the BLM made further recommendations on the onsite to avoid those areas where possible, but disturbances within these areas will require a site specific reclamation COA. Overcoming the unfavorable properties or limitations requires special design, extra maintenance, and costly alteration.

The map unit symbols within this project area were filtered and map units representing 3.0% or greater in extent within the pod boundary are displayed. Dominate soil map units are listed in the table below with their individual acreage and percentage of the area within the POD boundary.

**Table 3.1 Dominate soils affected by the proposed action include:**

<b>Map Unit</b>	<b>Map Unit Name</b>	<b>Acres</b>	<b>Percent</b>
233	Ustic Torriorthents, gullied	629.5	25%
111	Bidman-Parmleed loams, 0 to 6 percent slopes	264.7	10%
146	Forkwood-Cushman loams, 0 to 6 percent slopes	255.4	10%
148	Forkwood-Ulm loams, 0 to 6 percent slopes	185.3	7%
145	Forkwood-Cambria loams, 0 to 6 percent slopes	143.0	6%
206	Samday-Shingle-Badland complex, 10 to 45 percent slopes	134.0	5%
115	Bowbac-Worf fine sandy loams, 3 to 15 percent slopes	117.7	5%
156	Hiland fine sandy loam, 0 to 6 percent slopes	92.6	4%
170	Keeline-Tulloch loamy sands, 6 to 30 percent slopes	85.6	3%

For more detailed soil information, see the NRCS Soil Survey (WY605 and WY619). Additional site specific soil information is included in the Ecological Site interpretations.

### 3.2.2. Ecological Sites

Ecological Site Descriptions are used to 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 Natural Resources Conservation Service published soil survey soils information.

The map unit symbols for the soils identified above and the associated ecological sites for the identified soil map unit symbols found within the POD boundary are listed in the table below.

**Table 3.2 Map Units and Ecological Sites**

Map Unit	Ecological Site
233	Misc. areas
111	LOAMY (10-14NP)
146	LOAMY (10-14NP)
148	LOAMY (10-14NP)
145	LOAMY (10-14NP)
206	SHALLOW CLAYEY (10-14NP)
115	SANDY (10-14NP)
156	SANDY (10-14NP)
170	SANDY (10-14NP)

Dominate Ecological Sites and Plant Communities identified in this POD and its infrastructure are predominately miscellaneous areas, Loamy and Sandy sites.

*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. These soils are moderately deep to very deep (greater than 20" to bedrock), well drained soils that formed in alluvium and residuum derived from sandstone and shale. These soils have moderate permeability. 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 mid-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.

Dominate vegetation include needleandthread, western wheatgrass, green needlegrass, blue grama, prairie junegrass and Sandberg bluegrass. 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.

*Sandy Sites* occur on nearly level to steep slopes on landforms which include alluvial fans, hillsides, plateaus, ridges and stream terraces in the 10-14 inch precipitation zone. The soils of this site are moderately deep to very deep (greater than 20"to bedrock), well drained soils that formed in eolian deposits or residuum derived from unspecified sandstone. These soils have moderate, moderately rapid or rapid permeability. The main soil limitations include low available water holding capacity, and high wind erosion potential. The present plant community is a Needleandthread/ Threadleaf sedge/ Fringed sage Plant Community. Cool-season mid-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. The dominate understory grasses includes needleandthread, threadleaf sedge, prairie junegrass, and fringed sagewort.

A summary of the ecological sites within the project area are listed in the table below along with the individual acreage and the percentage of the total area identified within the POD boundary.

**Table 3.3 Summary of Ecological Sites**

<b>Ecological site</b>	<b>Acres</b>	<b>Percent</b>
LOAMY (10-14NP)	1053.4	41%
Misc area	669.3	26%
SANDY (10-14NP)	435.9	17%
SHALLOW CLAYEY (10-14NP)	134.0	5%
CLAYEY (10-14NP)	123.9	5%
LOWLAND (10-14NP)	73.6	3%
SHALLOW LOAMY (10-14NP)	34.4	1%
SALINE UPLAND (10-14NP)	30.2	1%

### **3.2.3. Soils Susceptible to Erosion**

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

Approximately 35% of the area within the Lancer 1 POD boundary contains soil mapping units with a named soil component identified as being highly erosive due to wind or water erosion. Approximately 5% of the project area has slopes of 25% or more. Areas of slighter slopes and area near drainages usually have deeper soils. Deeper soils tend to have a higher probability of supporting shrubbrush grassland communities. On surfaces with steep topography, vegetation is sparse or even barren. Barren steep slopes experience higher velocity of water movement during heavy storm events. As this storm water moves down slope the velocity is mitigated by thicker vegetation of the sagebrush grasslands. Road and pipeline construction removes vegetation that mitigates and controls water velocity. This loss of vegetative buffer increases water velocity and head cutting.

Soils with slopes of less than 25% may also be prone to high erosion because of the soil type, particle size, texture, or amount of organic matter. Other contributing factors to slope stability include slope length, slope aspect and colluvium. Slope length has considerable control over runoff and potential accelerated water erosion. Slope aspect is the direction which the surface of the soil faces. Slope aspect may affect soil temperature, evapotranspiration, wind contact and soil moisture. Colluvium is poorly sorted debris that has accumulated at the base of slopes, in depressions, or along small streams through gravity, soil creep, and local wash. It consists largely of material that has rolled, slid or fallen down the slope under the influence of gravity. The rock fragments in colluvium are usually angular, in contrast to the rounded, water-worn cobbles and stones in alluvium and glacial outwash. These factors in combination with slope determine soil stability and the potential for mass soil movement.

Approximately 25% of the project area has soils which are classified as Ustic Torriorthents, gullied. This soil map unit is classified at the subgroup level of soil taxonomy, indicating a wide range in soil properties making soil suitability's, limitations and interpretations difficult to predict. The gullied phase is used for areas having gullies so deep that intensive measures, including reshaping, are required to reclaim

the soil. No ecological site is assigned to the map unit (Soil Survey Manual Soil Survey Division Staff 1993).

**3.2.4. Reclamation Potential**

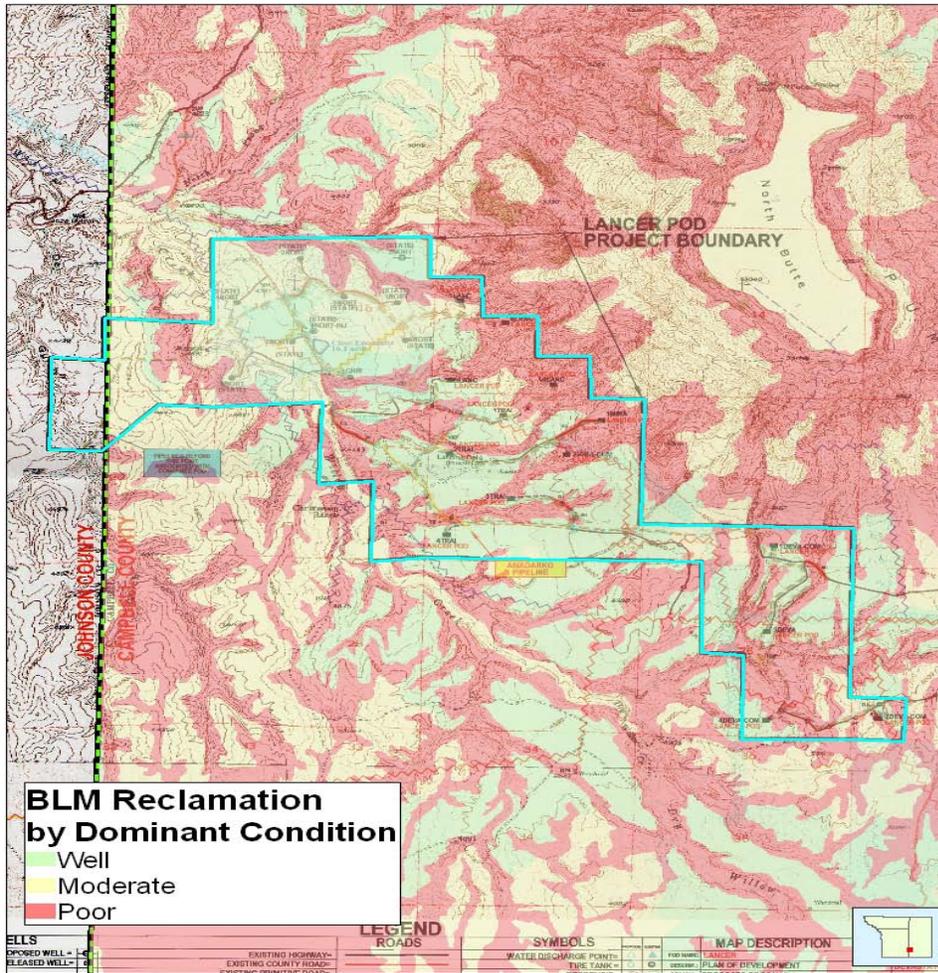
Soils with poor reclamation and re-vegetation potential occur throughout the project area as shown in Table 3.4. Currently, soil conditions in the project area are being impacted by CBNG development as well as traditional activities, including livestock grazing and wildlife use. Much of the area is covered with soils that are easily damaged by use or disturbance or are difficult to revegetate or otherwise reclaim. Soil impacts (e.g., roads, linear pipeline scars, and artificial wet areas) can be readily observed in the area. This high erosion potential could result in higher suspended sediment and turbidity levels in the Powder River.

In the absence of recoverable topsoil as is common throughout the project area, the surface organic matter in the form of vegetation, litter and biological crust are critical to maintaining the integrity and viability of the soil.

**Table 3.4 Reclamation Potential within the Lancer 1 Project Area**

<b>Reclamation Potential</b>			
	<b>Well/Good</b>	<b>Moderate</b>	<b>Poor</b>
<b>Total Acres</b>	614	736	1,110
<b>% of Project Area</b>	26%	31%	43%

Reclamation potential of soils varies throughout the project area. The main soil limitations in the project area include: depth to bedrock, low organic matter content, and high erosion potential especially in areas of steep slopes. Some of the soils and landforms of this area present distinct challenges for development. Approximately 5% of the area has slopes greater than 25% making stabilization of disturbance and reclamation challenging and possibly unachievable.



**Figure 3.1 Reclamation Potential of Lancer 1 POD Soils**

**3.2.5. Wetlands/Riparian**

The Lancer 1 POD area is interspersed with incised ephemeral drainages which contain isolated small areas with riparian type vegetation. The cottonwoods we observed within these ephemeral drainages were void of foliage and appear to be dead or dying.

**3.2.6. Invasive Species**

A database containing invasive species locations and other data is maintained by the Wyoming Energy Resource Information Clearinghouse (WERIC). The WERIC database was created cooperatively by the University of Wyoming, BLM and county Weed and Pest offices. The following state-listed noxious weeds and/or weed species of concern infestations were discovered by a search of the WERIC database ([www.weric.info](http://www.weric.info)):

- Spotted knapweed
- Diffuse knapweed
- Russian knapweed
- Canada thistle
- Scotch thistle
- Black henbane
- Common cocklebur

Additionally, the operator or BLM confirmed the following infestations and/or documented additional weed species during field investigations:

- Cheatgrass

The state-listed noxious weeds are listed in PRB FEIS Table 3-21 (p. 3-104) and the Weed Species of Concern are listed in Table 3-22 (p. 3-105).

### **3.3. Wildlife**

Wildlife evaluations focused on species or species groupings considered ecologically, economically, or socially important. Several resources were consulted including wildlife databases compiled and managed by the BLM Buffalo Field Office (BFO), the PRB FEIS, and Wyoming Game and Fish Department (WGFD) big game and sage-grouse maps.

BLM and Yates Petroleum Corporation personnel conducted field visits to the area on May 5, 2010. A BLM biologist verified the wildlife survey information, evaluated impacts to wildlife resources, and recommended project modifications where wildlife issues arose.

Habitat assessment and wildlife inventory surveys on the Lancer 1POD project area were performed by Wildlife Resources, LLC (2008, 2009, 2010). They surveyed bald eagle nesting and roosting habitat, raptor nest occupancy, greater sage-grouse and sharp-tailed grouse lek and nesting habitat, black-tailed prairie dog colonies, mountain plover habitat and occurrence, and Ute ladies'-tresses orchid habitat. All surveys were conducted according to the Powder River Basin Interagency Working Group's protocols ([http://www.blm.gov/wy/st/en/field\\_offices/Buffalo/wildlife.html](http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html)).

#### **3.3.1. Habitat Types**

Habitats contained within the Lancer 1 POD occur on semi flat ridges, in deeply incised draws, and on occasional rock outcroppings. Plant communities are composed of sparse to dense sagebrush habitat supporting grasses, forbs, half-shrubs, and shrubs. For more detailed ecological site descriptions, refer to sections 3.2.

#### **3.3.2. Threatened, Endangered, Proposed, and Candidate Species**

##### **3.3.2.1. Black-footed ferret**

Black-footed ferrets are a nocturnal predator closely associated with prairie dogs; depending almost entirely upon them for food and den sites. Research indicates that black-footed ferret populations require at least 1,000 acres of black-tailed prairie dog colonies for survival (USFWS 1989). The project area supports approximately 108 acres of documented prairie dog colonies, of which only a small six-acre colony was confirmed active (Wildlife Resources 2010).

The USFWS listed the black-footed ferret as Endangered on March 11, 1967. Active reintroduction efforts have reestablished populations in Mexico, Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. The USFWS did not include the black-footed ferret in its 2010 list of threatened, endangered, candidate, and proposed species for the BLM Buffalo Field Office (USFWS 2010b).

##### **3.3.2.1.1. Blowout Penstemon**

Blowout penstemon is a regional endemic of the Sand Hills of west central Nebraska and the northeastern Great Divide Basin in Carbon County, Wyoming. The species was listed as endangered under the Endangered Species Act (ESA) on September 1, 1987. Suitable blowout penstemon habitat consists of sparsely vegetated, early successional, shifting sand dunes and blowout depressions created by wind (BLM 2005). In Wyoming, the habitat is typically found on sandy aprons or the lower half of steep sandy slopes deposited at the base of granitic or sedimentary mountains or ridges. Based on the onsite

assessment conducted by the BLM wildlife biologist and Wildlife Resources (2008), the project area does not contain areas with these characteristics, and blowout penstemon is not expected to occur.

#### **3.3.2.1.2. Ute Ladies'-Tresses Orchid**

Ute ladies'-tresses orchid was listed as threatened under the ESA on January 17, 1992. Wyoming drainages with documented orchid populations include Wind Creek and Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. A WYNDD model predicts undocumented populations may be present particularly within southern Campbell and northern Converse Counties.

According to Wildlife Resources (2008, 2010), suitable habitat is restricted to a 900 meter reach of Willow Creek rendered perennial due to an artesian well. However, soil types (i.e., clayey and alkaline) are not appropriate for Ute ladies'-tresses occurrence and no orchids were observed during a survey conducted on September 2, 2009. Ute ladies'-tresses orchid is not expected to occur in the project area. The affected environment for ULT is discussed in the PRB FEIS on pg. 3-175.

#### **3.3.2.2. Proposed Species**

##### **3.3.2.2.1. Mountain Plover**

According to the USFWS (2010), "the mountain plover is a small terrestrial shorebird inhabiting open, flat lands with sparse vegetation". This condition often occurs in prairie dog colonies. The Lancer 1 project area contains suitable mountain plover habitat that is limited and fragmented (Wildlife Resources 2010). However, no mountain plovers were observed during surveys conducted in 2010.

The USFWS reinstated a proposal to list the mountain plover under ESA on June 29, 2010 (USFWS 2010). The species is also a Wyoming BLM sensitive species, a Wyoming game and Fish Department Species of Greatest Conservation Need (SGCN), and is a USFWS Bird of Conservation Concern for Region 17. The affected environment for mountain plover is discussed in the PRB FEIS on pg. 3-177 to 3-178.

#### **3.3.2.3. Candidate Species**

##### **3.3.2.3.1. Greater Sage-grouse**

Sage-grouse are of magnified conservation concern because populations are declining range-wide and within the PRB. Sage-grouse within the Powder River Basin (PRB) link the Wyoming basin population to those in Montana and South Dakota (Doherty 2008, US Fish and Wildlife Service 2010).

Sage-grouse are a Wyoming BLM sensitive species, a WGFD Species of Greatest Conservation Need (SGCN) (WGFD 2005), and are considered a candidate for listing under the Endangered Species Act (USFWS 2010). An important additional value of the species is its potential to serve as an indicator of healthy, functioning sagebrush-steppe ecosystems. High mobility allows sage-grouse to selectively utilize broad landscapes for recruitment and survival. Consequently, management for sage-grouse provides conservation coverage for sagebrush ecosystems and associated wildlife including many BLM sensitive species (Rowland et al., 2006).

#### **Range-wide Context**

Natural and human-caused stressors (e.g., wildfire, heavy grazing, tillage agriculture, energy development including CBNG, severe storms, periodic drought,) combine in complex ways to impact sagebrush ecosystems upon which sage-grouse depend. Viewed as impediments to socio-economic development, sagebrush ecosystems have been the focus of intentional conversion to grass or cropland for over a century, and have experienced severe loss and alteration across western North America. Consequently sage-grouse have experienced species-wide population declines and a 44 to 50% range contraction (Braun 1998, Schroeder et al. 2004).

### Northeast Wyoming

The sage-grouse population within northeast Wyoming also exhibited a steady long term downward trend from 1967 to 2009 (WGFD 2008b Figure 3.2) and has experienced a 79% decline over 12 years; coincident with CBNG development (US Fish and Wildlife Service 2010). CBNG-induced effects include: 1) habitat loss, fragmentation, and degradation; 2) lek abandonment; 3) decreased lek attendance; 4) lower nest initiation; 5) poor nest success and chick survival; and 6) infrastructure avoidance during winter.

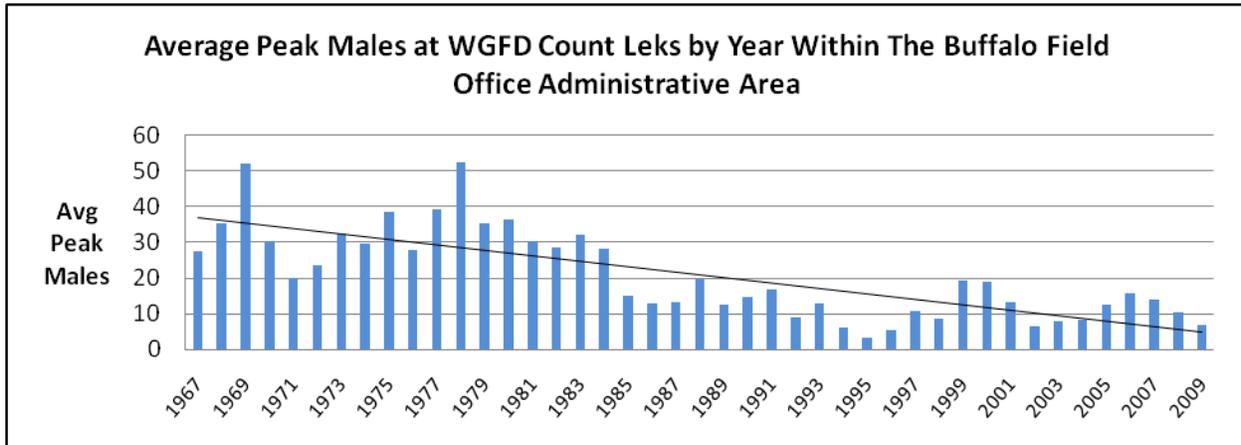


Figure 3.2

The PRB FEIS (BLM 2003, pg. 4-270) acknowledged and disclosed anticipated effects on sage-grouse associated with CBNG development in the PRB by stating “the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its federal listing. Local populations may be extirpated in areas of concentrated development, but viability across the Project Area (Powder River Basin) or the entire range of the species is not likely to be compromised.”

### Core Population Area Strategy

The State of Wyoming has adopted a Core Area concept that, on a state-wide basis, is deemed adequate to maintain viable sage-grouse populations (Freudenthal 2010). However, while the core area strategy was intended to protect “...no less than two-thirds of the Sage-grouse in Wyoming” (Sage Grouse Implementation Team 2008), core areas contain only approximately 26% of the PRB subpopulation based on 2007-2009 peak male counts (Nyssa Whitford, WGFD, personal communication). To address this inadequacy in the PRB, the BLM, in coordination with the State of Wyoming identified Connectivity habitat designed to link Wyoming sage-grouse populations to those in Montana and therefore contribute to maintenance of regional population viability.

On June 28, 2010 the Governor’s Sage-grouse Implementation Team recommended procedures and guidelines for development inside and outside of Core and Connectivity habitats. The Governor of Wyoming adopted those recommendations in Executive Order 2010-4 (Freudenthal 2010), noting that new development within “Core Population Areas” should be authorized when it can be demonstrated that the activity will not cause decline in sage-grouse populations. Executive Order 2010-4 encourages development (e.g., CBM developments) outside of Core Population Areas and recommends a standard 0.25-mile no surface occupancy and two-mile seasonal buffer around sage-grouse leks. Executive Order 2010-4 indicated that the development scenarios should be designed to maintain populations, habitats, and essential migration routes, but acknowledged that the strategy may result in reduced sage-grouse numbers outside of core areas. The closest Core Area is eight miles west of the project area.

### Lancer 1 Site Specific Information

The following paragraphs detail sage-grouse occurrence and habitat use information specific to the Lancer 1 POD area and for a 4-mile radius from the project boundary.

The Lancer 1 POD is located in an area where high quality sage-grouse habitat is juxtaposed with intensifying energy development. Important land uses in the area include livestock grazing, nearby uranium developments, conventional oil wells, and coalbed methane developments.

The Lancer 1 POD area supports “sagebrush habitat capable of supporting various seasonal habitats for sage-grouse” (Wildlife Resources 2008). Six occupied sage-grouse leks occur within two miles of the Lancer POD. However, impacts to sage-grouse leks due to oil and gas development are discernible to a distance of four miles (Walker et al. 2007, Walker 2008). WGFD records indicate that 11 occupied sage-grouse leks occur within four miles of the project area (Table 3.5).

**Table 3.5 Occupied sage-grouse leks within 4 miles of the Lancer 1 POD wells.**

<b>Lek Name</b>	<b>Distance from Project Area (mi)</b>
38-Christensen Ranch 1	1.0
38-Christensen Ranch 2	1.4
38-Christensen Ranch 3	3.7
38-Christensen Ranch 5	2.6
38-Christensen Ranch 7	2.1
38-Dry Willow	0.8
38-Mud Spring Creek	3.8
38-North Butte	2.0
38-Windmill	1.9
38-Windmill North	0.9
38-Windmill NW	1.8

Spatially explicit habitat models provide a tool by which landscape context may be integrated with land management effects analysis (Doherty 2008). Consequently, habitat models were used to characterize impacts associated with the Lancer 1 POD. There are 2,554 acres within the Lancer 1 POD boundary, of which 1,850 acres (72%) are modeled high quality nesting habitat and 1,661 acres (65%) are high quality winter habitat. Sage-grouse winter and nesting habitats overlap.

#### **3.3.3. BLM Sensitive Species**

Wyoming BLM has prepared a list of sensitive species on which management efforts should be focused towards maintaining habitats under a multiple use mandate. The goals of the policy are to:

- Maintain vulnerable species and habitat components in functional BLM ecosystems
- Ensure sensitive species are considered in land management decisions
- Prevent a need for species listing under the ESA
- Prioritize needed conservation work with an emphasis on habitat

The authority for the sensitive species policy and guidance comes from the Endangered Species Act of 1973, as amended; Title II of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and the Department Manual 235.1.1A. BLM Wyoming sensitive species that will be impacted beyond the level analyzed within the PRB FEIS are described below.

#### **3.3.3.1. Black-tailed Prairie Dog**

At the time the PRB FEIS was written, the black-tailed prairie dog was added to the list of candidate species for federal listing in 2000. It was removed from the list in 2004. Wyoming BLM considers black-tailed prairie dogs a sensitive species and continues to afford this species the protections described in the PRB FEIS. The black-tailed prairie dog is a WGFD Species of Greatest Conservation Need because populations are declining and habitat is vulnerable but not undergoing significant loss.

The black-tailed prairie dog is considered common in Wyoming, although its abundance fluctuates with activity levels of Sylvatic plague and the extent of control efforts by landowners. Comparisons with 1994 aerial imagery indicated that black-tailed prairie dog acreage remained stable from 1994 through 2001, but aerial surveys conducted in 2003 indicated that approximately 47% of the prairie dog acreage was impacted by Sylvatic plague and/or control efforts (Grenier et al. 2004). Due to human-caused factors, black-tailed prairie dog populations are now highly fragmented and isolated (Miller 1994). Most colonies are small and subject to potential extirpation due to inbreeding, population fluctuations, and other problems that affect long term population viability, such as landowner poisoning, and disease (Primack 1993, Meffe and Carroll 1994, Noss and Cooperrider 1994). The affected environment for black-tailed prairie dogs is discussed further in the PRB FEIS (pg 3-179).

Only one six-acre active black-tailed prairie dog colony was documented to occur in the Lancer 1 POD area (Wildlife Resources 2010).

#### **3.3.3.2. Bald Eagle**

Due to successful recovery efforts, the bald eagle was removed from the ESA on 8 August 2007. However, the bald eagle remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Bald eagles are a Wyoming BLM sensitive species and a WGFD Species of Greatest Conservation Concern (SGCC). They are also listed by USFWS as a Bird of Conservation Concern (BCC) for Region 17.

The closest documented bald eagle nest is located approximately 10 miles east of the Lancer 1 POD boundary. However, a documented bald eagle winter roost occurs within one mile of the Lancer POD (N1/2, T44N, R76W). Wildlife Resources (2010) conducted bald eagle winter roost surveys at this location from December 1, 2009 to March, 2010 (three surveys). Only one juvenile bald eagle was observed. Use of this roost has been documented during five years from 1985 to 2010, revealing unpredictable yet repeated use. In 2007, five winter roost surveys documented between one and 27 bald eagles. In 2008, counts conducted on 12-9 and 12-16 revealed 13 and 22 bald eagles, respectively. However, no bald eagles were observed in the roost location during seven additional counts conducted that winter. Use during that year appears to be related to winter temperatures (Brad Rogers, USFWS personal communication).

Winter bald eagle congregations at roost sites enhance survival by: facilitating access to unevenly distributed food resources; minimizing energy stress during severe weather; and fostering pair bond formation (USFWS 2007).

Further information regarding the affected environment for bald eagles is described in the PRB FEIS on pg. 3-175.

#### **3.3.4. Big Game**

Both pronghorn and mule deer were observed during field visits to the project area. WGFD data indicate that the project area is winter yearlong range for mule deer and pronghorn. Winter-yearlong use occurs when animals make general use of habitat on a year-round basis. However, there is a significant influx of additional animals into the area from other seasonal ranges during the winter months. No crucial big

game habitat is known to occur in the area. Populations of pronghorn and mule deer within their respective hunt areas are above WGFD objectives. The most current big game range maps are available from WGFD. The affected environment for pronghorn is discussed in the PRB FEIS on pp. 3-117 to 3-122 and for mule deer on pp. 3-127 to 3-132.

### 3.3.5. Migratory Birds

Migratory birds are those that migrate for the purpose of breeding and foraging at some point in the year. According to Instruction Memorandum No. 2008-050, BLM must include migratory birds in every NEPA analysis of actions that have potential to affect migratory bird species of concern to fulfill obligations under the Migratory Bird Treaty Act.

Habitat occurring in the project area includes rough to moderately rough terrain with numerous ridges, deep draws, and rolling hills. The primary vegetation throughout the project area is sagebrush grassland with scattered stands of cottonwoods in draws. 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 have declined more consistently than any other ecological association of birds over the last 30 years (WGFD 2009).

The WGFD Wyoming Bird Conservation Plan (Nicholoff 2003) identified three groups of high-priority bird species in Wyoming: 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 otherwise of high priority but are of local interest. Those species that are anticipated to occur in the project area are listed in Table 3.6.

**Table 3.6 High priority bird species that occur in the major vegetation type within the Lancer 1 Federal POD project area**

Level	Species	Wyoming BLM Sensitive
Level I	Brewer’s sparrow	Yes
	Ferruginous hawk	Yes
	Greater sage-grouse	Yes
	Long-billed curlew	Yes
	McCown’s longspur	
	Mountain plover	Yes
	Sage sparrow	Yes
	Short-eared owl	
	Upland sandpiper	
	Western burrowing owl	Yes
Level II	Black-chinned hummingbird	
	Bobolink	
	Chestnut-collared longspur	
	Dickcissel	
	Grasshopper sparrow	
	Lark bunting	
	Lark sparrow	
	Loggerhead shrike	Yes
	Sage thrasher	Yes
	Vesper sparrow	
Level III	Common poorwill	
	Say’s phoebe	

The affected environment for migratory birds is discussed further in the PRB FEIS (pp. 3-150 to 3-153).

### 3.3.6. Raptors

Raptor nesting substrate in the Lancer 1 POD area includes juniper, willow and cottonwood trees located along Willow Creek; and ponderosa pine and cliff habitat located near North Butte. Thirty five raptor nests were observed and/or documented within 0.5 miles of the Lancer 1 POD boundary (Wildlife Resources 2010) revealing nesting habitat of long-term value to raptors (multiple species over many years).

Raptor species documented to nest on the Lancer 1 POD area included great horned owl, long-eared owl, red-tailed hawk, and golden eagle. Five nests were confirmed active within 0.5 mile of the POD boundary in 2010 including two golden eagle nests, two red-tailed hawk nests, and one long-eared owl nest. Further treatment of the affected environment for raptors can be found on pages 3-141 to 3-148 of the PRB FEIS.

### 3.3.7. 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.

Since its discovery in 1999 in New York, WNV has become firmly established and spread across the United States. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. Though less than 1% of mosquitoes are infected with WNV, they still are very 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 continue to escalate. Historic data collected by the CDC and published by the USGS at [www.westnilemaps.usgs.gov](http://www.westnilemaps.usgs.gov) are summarized in Table 3.7. Reported data from the Powder River Basin (PRB) includes Campbell, Sheridan and Johnson counties.

**Table 3.7 Historical West Nile Virus Information**

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

**Source:** Wyoming Department of Health, [www.badskeeter.org/detections.html](http://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 are likely to increase over the next few years, followed by a gradual decline in the number of reported cases.

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

Mosquitoes can potentially breed in any standing water that lasts more than four days. In the Powder River Basin, there is generally increased surface water availability associated with CBNG development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the Powder River Basin indicates WNV mosquito vectors were notably more abundant on a developed CBNG site than two 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 nor have they been used to treat a wide range of potential mosquito breeding habitat such as that associated with CBNG development.

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

### **3.4. Water Resources**

The project area is within the Upper Powder River drainage system and within the Willow Creek watershed, a tributary to the Upper Powder River. The project area is primarily on the east side slopes of Willow Creek and encompasses the small ephemeral tributaries in the upper to middle reaches of the Willow Creek watershed. The ephemeral drainages vary from narrow, sparsely vegetated, steeply incised with headcuts to broad, open, sinuous drainages covered with grass.

The Wyoming Department of Environmental Quality (WDEQ) has assumed primacy from United States Environmental Protection Agency for maintaining the water quality in the waters of the state. The Wyoming State Engineer's Office (WSEO) has authority for regulating water rights issues and permitting impoundments for the containment of surface waters of the state. The Wyoming Oil and Gas

Conservation Commission (WYOGCC) has authority for permitting and bonding off channel pits that are located over State and fee minerals.

### **3.4.1. Groundwater**

The groundwater in this project area has historically been used for stock water or domestic purposes. A search of the Wyoming State Engineer Office (WSEO) Ground Water Rights Database for this area showed 13 registered stock and domestic water wells within 1 mile of a federal CBNG producing well in the POD with depths ranging from 160 to 780 feet. For additional information on water, please refer to the PRB FEIS (January 2003), Chapter 3, Affected Environment pages 3-1 through 3-36 (groundwater).

WDEQ water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following general limits for Total Dissolved Solids (TDS): 500 mg/l TDS for Drinking Water (Class I), 2000 mg/l for Agricultural Use (Class II) and 5000 mg/l for Livestock Use (Class III). For additional water quality limits for groundwater, please refer to the WDEQ web site.

The ROD includes a Monitoring, Mitigation and Reporting Plan (MMRP). The objective of the plan is to monitor those elements of the analysis where there was limited information available during the preparation of the EIS. The MMRP called for the use of adaptive management where changes could be made based on monitoring data collected during implementation.

Specifically relative to groundwater, the plan identified the following (PRB FEIS ROD page E-4):

- The effects of infiltrated waters on the water quality of existing shallow groundwater aquifers are not well documented at this time;
- Potential impacts will be highly variable depending upon local geologic and hydrologic conditions;
- It may be necessary to conduct investigations at representative sites around the basin to quantify these impacts;
- Provide site specific guidance on the placement and design of CBM impoundments, and
- Shallow groundwater wells would be installed and monitored where necessary.

The production of CBNG necessitates the removal of some degree of the water saturation in the coal zones to temporarily reduce the hydraulic head in the coal. The Buffalo Field Office has been monitoring coal zone pressures as expressed in depth to water from surface since the early 1990s in the PRB (Figure 3.3).

As a result of CBNG production, the target coal zone pressure may have been reduced through off set water production. There are 4 existing groundwater monitoring wells drilled to the Big George coal located in proximity to the Lancer 1 POD, as listed in the table below.

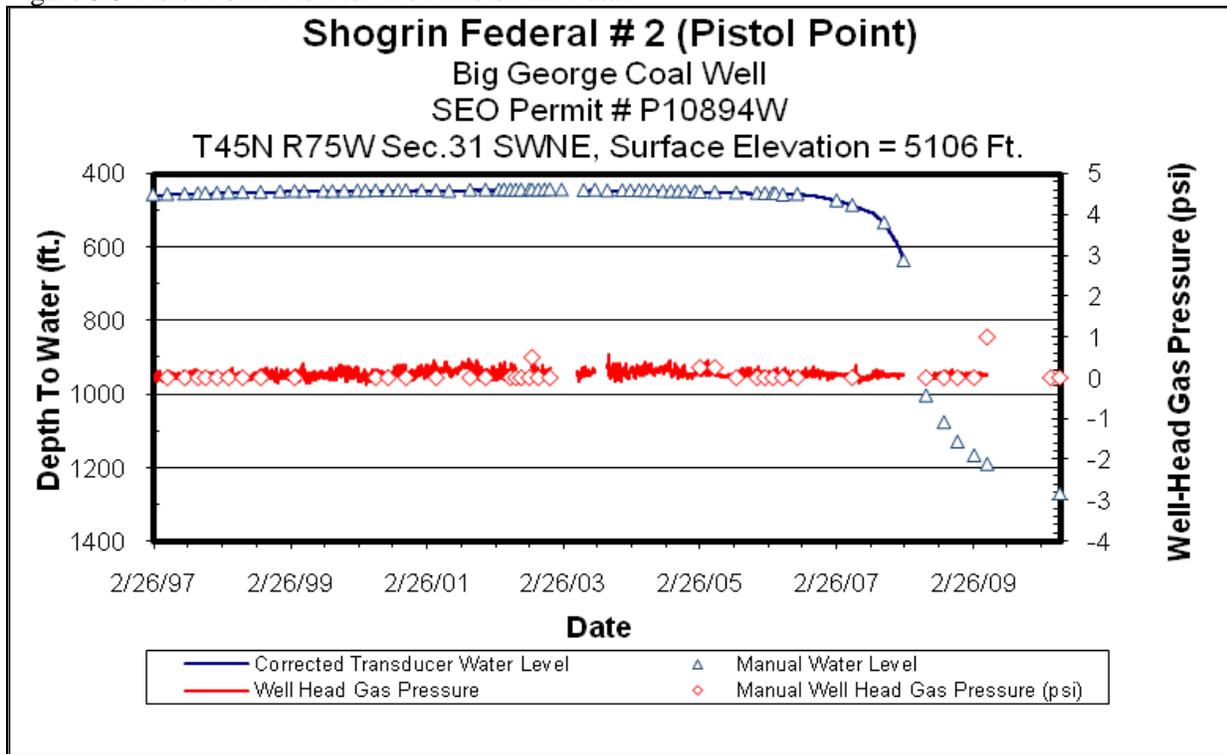
<b>Monitor Well Name</b>	<b>QtrQtr</b>	<b>Sec</b>	<b>T N</b>	<b>R W</b>	<b>Distance from Lancer 1 POD, mi</b>	<b>Total Depth, ft</b>	<b>Initial WL, ft depth from surface</b>	<b>Most Recent WL, ft depth from surface</b>	<b>Drilled by</b>	<b>Date Installed</b>
Pistol Point	SWNE	31	45	75	4.0 NE	1559	456	1269	Not Avail	3/3/1998
4 Mile Coal	NWNE	11	43	75	6.1 SE	1678	866	854	Williams	11/30/2007
Streeter	NWSE	22	43	78	12.0 SW	1400	159	305	North Finn	8/4/2004
Bullwhacker	NWSE	16	42	77	12.7 S/SW	1447	93	1163	Williams	2/26/2002

The initial water level of the Big George Coal was recorded between 93 and 456 feet below ground level prior to the majority of drilling and production in the area. In the most recent measurements, dated June, 2010, the water level ranged between 305 and 1269 feet below ground level.

Three of these locations include monitoring wells in the overlying water bearing sand zones in the Wasatch formation. The Pistol Point location does not have sand monitor wells. At two of the sites, 4 Mile and Streeter, there does not appear to be any hydraulic connection between the Big George coal beds and the shallower Wasatch sands. At the Bullwhacker site, the sands, which are located 100 feet stratigraphically above the top of the Big George coal are exhibiting drawdown to a lesser extent than the coal, which indicates some degree of connectivity.

This level of depressurization is within the potential predicted in the PRB FEIS which was determined through the Regional Groundwater Model for that document. For additional information, please refer to the PRB FEIS Chapter 4 Groundwater and the Wyoming State Geological Survey's Open File Report 2009-10 titled "1993-2006 Coalbed Natural Gas (CBNG) Regional Groundwater Monitoring Report: Powder River Basin, Wyoming" which is available on their website at <http://www.wsgs.uwyo.edu>.

Figure 3.3 Pistol Point Monitor Well Historical Data:



### 3.4.2. Surface Water

The project area is within the Willow Creek watershed which is tributary to the Upper Powder River watershed. Most of the drainages in the area 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 ephemeral drainages vary from narrow, bare soil, steeply incised with headcuts to broad, open, sinuous drainages covered with grass.

The PRB FEIS presents the historic mean Electrical Conductivity (EC, in  $\mu\text{mhos/cm}$ ) and Sodium Adsorption Ratio (SAR) by watershed at selected United States Geological Survey (USGS) Gauging Stations in Table 3-11 (PRB FEIS page 3-49). These water quality parameters “illustrate the variability in ambient EC and SAR in streams within the Project Area. The representative stream water quality is used in the impact analysis presented in Chapter 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBM produced water of varying chemical composition to surface drainages within the Project Area” (PRB FEIS page 3-48). For the Upper Powder River the EC ranges from 1,797 at Maximum monthly flow to 3,400 at Low monthly flow and the SAR ranges from 4.76 at Maximum monthly flow to 7.83 at Low monthly flow. These values were determined at the USGS station located at Arvada, Wyoming (PRB FEIS page 3-49).

The operator did not identify any natural springs within this POD boundary.

For more information regarding surface water, please refer to the PRB FEIS Chapter 3 Affected Environment pages 3-36 through 3-56.

### 3.5. Cultural Resources

Class III cultural resource inventory was performed for the Lancer POD prior to on-the-ground project work (BFO project no. 70090038). Quality Services conducted a block class III cultural resource inventory 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 Archaeologist, reviewed the report for technical adequacy and compliance with Bureau of Land Management (BLM) standards, and determined it to be adequate. The following sites are in or near the project area.

Site Number	Site Type	National Register Eligibility
48CA268	Pumpkin Buttes TCP	Eligible
48CA423	Prehistoric Site	Not Eligible
48CA426	Prehistoric Site	Not Eligible
48CA427	Prehistoric Site	Eligible
48CA428	Prehistoric Site	Not Eligible
48CA662	Prehistoric Site	Not Eligible
48CA663	Prehistoric Site	Not Eligible
48CA769	Prehistoric Site	Not Eligible
48CA1402	Historic Site	Not Eligible
48CA1403	Prehistoric Site	Not Eligible
48CA1404	Prehistoric Site	Not Eligible
48CA1405	Prehistoric Site	Not Eligible
48CA1418	Prehistoric Site	Not Eligible
48CA1426	Prehistoric Site	Not Eligible
48CA1427	Prehistoric Site	Not Eligible
48CA2356	Prehistoric Site	Not Eligible
48CA2360	Prehistoric Site	Not Eligible
48CA3150	Prehistoric Site	Not Eligible
48CA3151	Prehistoric Site	Eligible
48CA3154	Prehistoric Site	Not Eligible
48CA3156	Prehistoric Site	Eligible
48CA3157	Prehistoric Site	Not Eligible
48CA6136	Prehistoric Site	Not Eligible
48CA6422	Prehistoric Site	Eligible
48CA6425	Prehistoric Site	Eligible
48CA6428	Prehistoric Site	Unevaluated
48CA6429	Prehistoric Site	Not Eligible
48CA6430	Prehistoric Site	Not Eligible
48CA6432	Prehistoric Site	Eligible
48CA6433	Prehistoric Site	Unevaluated
48CA6437	Prehistoric Site	Not Eligible
48CA6440	Prehistoric Site	Not Eligible
48CA6947	Prehistoric Site	Eligible
48CA6948	Prehistoric Site	Not Eligible
48CA6949	Prehistoric Site	Not Eligible
48CA6950	Prehistoric Site	Not Eligible
48CA6951	Prehistoric Site	Not Eligible
48CA6952	Prehistoric Site	Eligible
48CA6953	Prehistoric Site	Not Eligible

The Pumpkin Buttes (48CA268) Traditional Cultural Property (TCP) is eligible for the National Register of Historic Places for its association with significant historical events, for its association significant historic individuals, for its ability to provide significant historic and prehistoric information, as a location associated with the traditional beliefs of numerous Native American groups about their cultural history, and as a location where Native American religious practitioners have historically gone to perform ceremonial activities in accordance with traditional cultural rules of practice. Although there is currently ongoing energy development in the vicinity, the setting of the site is considered to be intact and contributes to its eligibility. The Lancer I POD will not physically impact the TCP, but infrastructure is proposed within the setting of the site.

### **3.6. Air Quality**

Existing air quality throughout most of the Powder River Basin is in attainment with all ambient air quality standards. Although specific air quality monitoring is not conducted throughout most of the Powder River Basin, air quality conditions in rural areas are likely to be very good, as characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant concentrations.

Existing air pollutant emission sources within the region include following:

- Exhaust emissions (primarily CO and nitrogen oxides [NO<sub>x</sub>]) 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;
- Dust (particulate matter) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas and road sanding during the winter months;
- Transport of air pollutants from emission sources located outside the region;
- Dust (particulate matter) from coal mines;
- NO<sub>x</sub>, particulate matter, and other emissions from diesel trains; and
- SO<sub>2</sub> and NO<sub>x</sub> from power plants.

For a complete description of the existing air quality conditions in the Powder River Basin, please refer to the PRB Final EIS Volume 1, Chapter 3, pages 3-291 through 3-299.

## **4. ENVIRONMENTAL CONSEQUENCES**

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

### **4.1. Alternative A**

The No Action Alternative was analyzed as Alternative 3 in the PRB FEIS, and is incorporated by reference into this EA. Information specific to resources for this alternative is included within the PRB Final EIS on pages listed in Table 4.1.

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

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

**4.2. Alternative B**

**4.2.1. Soils, Vegetation, and Ecological Sites**

**4.2.1.1. Direct and Indirect Effects**

The impacts listed below, singly or in combination, would increase the potential for valuable soil loss due to increased water and wind erosion, invasive plant establishment, and increased sedimentation and salt loads to the watershed system.

The effects to soils resulting from well, access roads and pipeline construction include:

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

- have a negative impact on revegetation. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
- Loss of soil vegetation cover, biologic crusts, organic matter and productivity. With expedient reclamation, productivity and stability should be regained in the shortest time frame.
- Soil erosion would also affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography and cover.
- Soil compaction – the collapse of soil pores results in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction may be remediated by plowing or ripping.
- Modification of hill slope hydrology.
- An important component of soils in Wyoming’s semiarid rangelands, especially in the Wyoming big sagebrush cover type, are biological soil crusts, or cryptogamic soils that occupy ground area not covered with vascular plants. Biological soil crusts are predominantly composed of cyanobacteria, green and brown algae, mosses and lichens. They are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (BLM 2003). They are adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily disturbed or destroyed by surface disturbances associated with construction activities.

These impacts, singly or in combination, would increase the potential for valuable soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system.

#### **4.2.1.2. Highly Erosive Soils**

Approximately 35% of the area within the Lancer 1 POD boundary contains soil mapping units with a named soil component identified as being highly erosive due to wind or water erosion. Erosion rates are site specific and are dependent on soil, climate, topography and vegetative cover. Effects would be loss of soil vegetation cover, biologic crusts, organic matter and productivity. Soil compaction, the collapse of soil pores, results in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery.

In addition, soils which are more susceptible to wind and water erosion may be moved to the surface. Soils susceptible to erosion may be exposed to increased sedimentation. Effects would be erosion, increased gullies, and sedimentation. Soil erosion would also affect soil health and productivity. Impacts from erosion will be reduced by following the reclamation plan that was submitted by Yates Petroleum, and with use of BLM applied mitigation.

#### **4.2.1.3. Reclamation Potential**

Direct effects to vegetation would occur from ground disturbance caused by construction of roads, associated pipelines, and well locations. Effects are both short term and long term. Short term effects would occur where vegetated areas are disturbed but reclaimed within 1 to 3 years of the initial disturbance. Long-term effects would occur where road, well sites, water handling facilities, or other semi-permanent facilities would result in loss of vegetation and prevent reclamation for the life of the project.

Within the project area, 43% of the soils have poor reclamation potential. All ten wells approved in this action will be drilled without constructed pads or slot design. Vegetation will be mowed only. Surface disturbance is 0.1 acre per well site equating to 1.0 acre total disturbance for well sites. There are 5.03 miles of improved and engineered roads proposed within the project area accounting for 25.03 acres of surface disturbance. Three sections of proposed improved roads in the project area have been identified as having poor reclamation potential and require disturbed areas to be stabilized within 30 days of the initiation of construction activities. There are 2.83 miles of primitive road proposed within the project area accounting for 10.98 acres of disturbance. Approximately 3.36 miles of pipeline are proposed not within an access accounting for 13.03 acres of disturbance. Site specific designs were provided by the operator for five drainage crossings in sections of infrastructure that exceed maximum disturbance widths allowed under Pumpkin Buttes PA. All five drainage crossings were identified as having poor reclamation potential with a requirement for 30-day site stabilization. In addition, several improved or engineered road sections within the project area have been identified to have limited reclamation potential that will require disturbed areas to be stabilized within 30 days in a manner which eliminates accelerated erosion until a self-perpetuating native plant community has stabilized the site.

#### **4.2.1.4. Cumulative Effects**

The designation of the duration of disturbance is defined in the PRB FEIS (pg 4-1 and 4-151). Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization, as committed to by the operator in their POD Surface Use Plan and as required by the BLM in COAs.

Geomorphic effects of roads and other surface disturbance range from chronic and long-term contributions of sediment into waters of the state to catastrophic effects associated with mass failures of road fill material during large storms. Roads can affect geomorphic processes primarily by: accelerating erosion from the road surface and prism itself through mass failures and surface erosion processes; directly affecting stream channel structure and geometry; altering surface flow paths, leading to diversion or extension of channels onto previously unchanneled portions of the landscape; and causing interactions among water, sediment, and debris at road-stream crossings.

ISR uranium recovery sites lie adjacent to the Lancer 1 POD project area. Approved insitu uranium mining currently exists in Sections 4,5,6,7, 8, 9 of T44N, R76W, which is directly north and west of the project area. In addition, potential uranium deposits have been identified within the project area in Sections 16, 17, 20, 21, 22 of T44N, R76W. Uranium recovery would entail the addition of disturbance activities for construction of roads, facilities and well locations. Earth-moving activities associated with are nearly the same for those of CBNG projects. It involves construction of surface facilities, access roads, well fields, and pipelines and would include clearing of top soil and land grading. Drilling of wells and installation of pipelines will occur. Low levels of traffic generated by construction activities and daily operations when the project is operational would not significantly increase traffic or accidents on roads in the vicinity. However the addition of ISR uranium recovery project within the Lancer 1 POD project vicinity will add to the cumulative effect of soil disturbances and may delay interim and final reclamation on some of the roads proposed for use in Lancer 1 POD.

These impacts, singly or in combination, could increase the potential for valuable soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system.

##### **4.2.1.4.1. Mitigation Measures**

- Impacts to soils and vegetation from surface disturbance will be reduced by following the BLM applied mitigation. Mitigation measures applied to Lancer 1 POD include site stabilization within 30 days of the initiation of construction activities for proposed improved roads with “poor” reclamation

potential; minimizing disturbance widths for roads and pipeline corridors; and maintaining 20 feet vegetative buffers near drainages.

- Site specific designs were provided for five drainage crossings in sections of infrastructure that exceed maximum disturbance widths allowed under Pumpkin Buttes PA. Because these drainage crossings occur in project areas with “poor” reclamation potential, a requirement for 30-day stabilization was applied.
- The operator provided disturbance widths on their Surface Use Disturbance Form which adhere to the Pumpkin Buttes PA; however these disturbance widths were not provided as *operator committed measures* but are applied as site specific mitigation measures as COAs.
- The operator will follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231). The Wyoming Reclamation Policy applies to all surface disturbing activities. Authorizations for surface disturbing actions are based upon the assumptions that an area can and ultimately will be successfully reclaimed. BLM reclamation goals emphasize eventual ecosystem reconstruction, which means returning the land to a condition approximate to an approved “Reference Site” or NRCS Ecological Site Transition State. Final reclamation measures are used to achieve this goal. BLM reclamation goals also include the short-term goal of quickly stabilizing disturbed areas to protect both disturbed and adjacent undisturbed areas from unnecessary degradation. Interim reclamation measures are used to achieve this short-term goal.
- Compaction would be remediated by ripping.

#### **4.2.1.4.2. Residual Effects**

Residual Effects were also identified in the PRB FEIS at page 4-408 such as the loss of vegetative cover, despite expedient reclamation, for several years until desired native vegetation is successfully established.

#### **4.2.1.4.3. Wetlands/Riparian**

##### **4.2.1.4.3.1. Direct and Indirect Effects**

There will be no direct, indirect, cumulative, or residual effects on existing wetlands and riparian areas due to the produced waters being reinjected to a deep sand aquifer with no planned release of produced water on to surface lands.

#### **4.2.1.4.4. Invasive Species**

##### **4.2.1.4.4.1. Direct and Indirect Effects**

The use of existing facilities along with the surface disturbance associated with construction of proposed access roads, pipelines, water management infrastructure, produced water discharge points and related facilities would present opportunities for weed invasion and spread.

##### **4.2.1.4.4.2. Cumulative Effects**

Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry regimes in the areas of water release and storage. 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 knapweed, thistle, and cocklebur.

##### **4.2.1.4.4.3. Mitigation Measures**

The operator has committed to the control of noxious weeds and species of concern using the following measures identified in their Integrated Pest Management Plan (IPMP):

1. Control Methods include physical, biological, and chemical methods:  
Physical methods include mowing during the first season of establishment, prior to seed formation, and hand pulling of weeds (for small or new infestations). Biological methods include the use of domestic animals, or approved biological agents. Chemical methods include the use of herbicides, done in accordance with the existing Surface Use Agreement with the private surface owner.
2. Preventive practices:  
Certified weed-free seed mixtures will be used for re-seeding, and vehicles and equipment will be washed before leaving areas of known noxious weed infestations.
3. Education:  
The company will provide periodic weed education and awareness programs for its employees and contractors through the county weed districts and federal agencies. Field employees and contractors will be notified of known noxious weeds or weeds of concern in the project area.

**4.2.1.4.4. Residual Effects**

Control efforts by the operator are limited to the surface disturbance associated the implementation of the project. Cheat grass and other invasive species that are present within non-physically disturbed areas of the project area are anticipated to continue to spread unless control efforts are expanded. Cheatgrass 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 considered feasible at this time; these annual bromes would continue to be found within the project area.

**4.2.2. Wildlife**

Mitigating strategies for the Lancer 1 POD were developed following review of wildlife surveys conducted by Wildlife Resources LLC (2008, 2009, 2010), and following analysis of geospatial datasets for big game, raptors, bald eagles, sage-grouse, sharp-tailed grouse, mountain plover, black-tailed prairie dogs, and sagebrush,. Further, onsite inspections conducted by BLM and Yates Petroleum Corporation personnel revealed measures to reduce effects to wildlife resources

**4.2.2.1. Threatened, Endangered, Proposed, and Candidate Species**

The following table identifies anticipated effects to threatened, endangered, candidate, and proposed species. Only those species with anticipated effects will be discussed below.

**Table 4.2 Summary of Threatened and Endangered Species Habitat and Project Effects**

Common Name (scientific name)	Habitat	Project Effects	Rationale
<i>Endangered</i>			
Black-footed ferret	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NE	Only one six –acre black-tailed prairie dog colony is active in the area
Blowout penstemon ( <i>Penstemon haydenii</i> )	Sparsely vegetated, shifting sand dunes	NE	No suitable habitat present.
<i>Threatened</i>			
Ute ladies’-tresses orchid ( <i>Spiranthes diluvialis</i> )	Riparian areas with permanent water	NE	No suitable habitat present.

<b>Common Name (scientific name)</b>	<b>Habitat</b>	<b>Project Effects</b>	<b>Rationale</b>
<i>Proposed</i>			
Mountain plover	Short-grass prairie with slopes < 5%	NLJ	No plovers observed in 2010 surveys. Suitable habitat is fragmented and limited.
<i>Candidate</i>			
Greater Sage-grouse	Basin-prairie shrub, mountain-foothill shrub	MIH	Sagebrush cover will be affected.
<b>Project Effects</b> <b>LAA</b> - Likely to adversely affect <b>NE</b> - No Effect <b>NLAA</b> - May Affect, not likely to adversely affect individuals or habitat. <b>NLJ</b> – Not likely to jeopardize <b>MIH</b> – May impact individuals and health			

#### **4.2.2.1.1. Proposed Species**

##### **4.2.2.1.1.1. Mountain Plover**

No mountain plovers were observed during surveys conducted in 2009 and 2010. Therefore, direct, indirect or cumulative effects to mountain plover are not anticipated due to implementation of the Lancer 1 POD.

##### **4.2.2.1.1.2. Mitigation Measures**

To ensure that impact to nesting mountain plover do not occur in the future, the PROGRAMMATIC conditions of approval for mountain plover contained in Appendix A will be required.

##### **4.2.2.1.1.3. Residual Effects**

No residual effects to nesting mountain plover are expected to occur so long as the mitigation measures contained in Appendix A are effectively applied.

#### **4.2.2.1.2. Candidate Species**

##### **4.2.2.1.2.1. Greater Sage-grouse**

###### **4.2.2.1.2.1.1. Direct and Indirect Effects**

Direct effects to sage-grouse habitats associated with development of the Lancer 1 POD Alternative B include a total surface disturbance of 57.49 acres. This includes 10 CBNG well pads, 4.45 miles of improved road, 4.81 miles of primitive road, 3.36 miles of pipeline, and 1.06 miles of third party overhead power (Table 2.3). Most roads also include utility corridors. The magnitude of impact to sagebrush habitat due to this alternative warrants special emphasis on avoidance, minimization, and reclamation measures. Diverse, native seed mixtures composed of multiple functional/structural groups should be considered.

Design features specifically included in the proposed action under Alternative B to minimize impacts to sage-grouse include: radio telemetry monitoring to reduce well visits to an estimated once per week; expedient interim and final reclamation emphasizing re-establishment of native plant assemblages; pre-planning to maintain large patches of sagebrush;

Indirect CBNG effects to sage-grouse result from habitat fragmentation (i.e., habitat partitioning trending toward isolation) and degradation associated with: 1) human-caused displacement; 2) auditory disturbance; 3) infrastructure avoidance; 4) changes in predator species composition, abundance, and efficacy; 5) facilitated infestation and spread of noxious weeds; and 6) spread of west Nile virus. These

effects are difficult to quantify but are related to disturbance intensity, duration, recurrence frequency, arrangement, and extent.

Indirect effects may extend for some distance; reducing habitat function in zones surrounding CBNG developments (WGFD 2009). For example, Knick et al. (in press) estimated that development-facilitated corvid and mammalian predation (based on foraging distance) may extend 4.3 miles from human developments.

Walker et al. (2007) used a buffer of 350 meters (1,148 feet) from wells to approximate the area affected by CBNG development in the PRB. This metric was used to quantify indirect effects on modeled high quality nesting and winter sage-grouse habitat associated with implementation of the Lancer 1 POD.

Analysis revealed overlapping indirect impacts to 764 acres of modeled high quality nesting habitat and 660 acres of modeled high quality winter habitat by implementation of Alternative B.

**4.2.2.1.2.1.2. Cumulative Effects**

Energy development began in the PRB in the late 1800’s, but development accelerated after the 1960’s and has included mainly coal mining, conventional oil, and development of CBNG (BLM 2005). Energy-related surface disturbance in the PRB was projected to increase from 220,257 acres in 2003 to 514,732 acres by 2020 (BLM 2005). While reclamation measures have been, or will be applied to most of this area, habitat function for sage-grouse will not recover for many decades. Sage-grouse have re-occupied disturbed areas following ecological recovery (Braun 1998). However, energy-related disturbances are occurring at much greater rates than ecosystem recovery. Consequently, energy-related impacts to sage-grouse accrue as disturbance advances across the landscape.

Generally declining trends in sage-grouse lek attendance attributable to CBNG development in the PRB occur due to the effects of decreasing lek-to-well distance, and increasing well density that manifest over time following development (Harju et al. 2010). Recent research suggests that the combined effects of past, current, and foreseeable CBNG development within the vicinity of the project area are likely to impact the local sage-grouse population, cause declines in lek attendance, and may result in local extirpation.

The cumulative impact assessment area for this project was defined by a four mile radius around sage-grouse leks that occur within four miles of the project boundary (as recommended by Executive Order 2010-4, Freudenthal 2010). The well density change attributable to the Lancer1 POD was then evaluated within two miles of the eleven occupied sage-grouse leks located within the cumulative impact assessment area (WGFD 2010). Using this analysis technique, Lancer 1 POD wells would incrementally affect well density (i.e., wells/mi<sup>2</sup>) within two miles of three sage-grouse leks that are already well above the extreme impact threshold identified by the WGFD (WGFD 2009) (Table 4.3).

**Table 4.3 Existing, Lancer 1 additions, and foreseeable wells/mi<sup>2</sup> within two miles of sage-grouse leks.**

<b>Lek Name</b>	<b>Existing</b>	<b>Lancer1 POD Addition</b>	<b>Foreseeable (Pending)</b>
Dry Willow	7.0 wells/mi <sup>2</sup>	7.5 wells/mi <sup>2</sup>	8.3 wells/mi <sup>2</sup>
Windmill NW	7.0	7.1	7.6
Windmill North	6.8	7.1	7.6

The PRB FEIS (BLM 2003, p. 4-270) acknowledged and disclosed anticipated effects attributable to CBNG development by stating that “the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its federal listing. Local populations may be extirpated in areas of concentrated development,

but viability across the Project Area (Powder River Basin) or the entire range of the species is not likely to be compromised.” Based on the impacts described in the PRB FEIS and the findings of more recent research, the proposed action may contribute to a decline in male attendance at three of eleven occupied leks that occur within four miles of the project area, and may further contribute to eventual extirpation of the local grouse population. Uncertainties in these conclusions are: CBNG well “life” relative to the time lag in sage-grouse population effects (i.e., population persistence in developed areas); rate of ecological reintegration following well abandonment; and potential for subsequent sage-grouse population recovery.

#### **4.2.2.1.2.1.3. Mitigation Measures**

Mitigating measures applied to the Lancer 1 POD include sage-grouse breeding season timing limitations for surface disturbing activities (e.g., drilling, road construction) (March 1st – June 15<sup>th</sup>, Appendix A).

#### **4.2.2.1.2.1.4. Residual Effects**

While measures designed to reduce effects to sage-grouse were employed throughout the planning process, it is likely that the proposed activity will further degrade habitat effectiveness and depress sage-grouse recruitment and survival in the area. These effects were analyzed and disclosed in the PRB FEIS (BLM 2003, pg. 4-270).

#### **4.2.2.2. BLM-Sensitive Species**

BLM will take necessary actions to meet the policies set forth in sensitive species policy (BLM Manual 6840). BLM Manual 6840.22A states that “The BLM should obtain and use the best available information deemed necessary to evaluate the status of special status species in areas affected by land use plans or other proposed actions and to develop sound conservation practices. Implementation-level planning should consider all site-specific methods and procedures which are needed to bring the species and their habitats to the condition under which the provisions of the ESA are not necessary, current listings under special status species categories are no longer necessary, and future listings under special status species categories would not be necessary.”

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-265

#### **4.2.2.2.1. Bald Eagle**

##### **4.2.2.2.1.1. Direct and Indirect Effects**

To maintain the survival functions of bald eagle winter roosts, the BLM Buffalo Field Office employs a *seasonal* minimum disturbance-free buffer zone of one mile from all bald eagle winter roost sites (November 1 to April 1) (PRB FEIS ROD, BLM 2003, p. A-13). Further, a *year-round* disturbance-free buffer zone of 0.5 mile is required around bald eagle roost sites.

A bald eagle roost occurs within one mile of the Lancer 1 POD boundary. The Lancer 1 POD originally proposed CBNG wells and infrastructure within these distances that could impact the function of the identified roost, refer to the PRB FEIS, pgs. 4-251- 4-253. However, a no surface occupancy (NSO) lease stipulation (lease number WYW 153062) prohibits any infrastructure development within T42N, R76W, Section 15. This affects wells and associated infrastructure as follows: LANCER #5, LANCER #8, LANCER #9, and LANCER #10.

While the operator has requested a waiver to this lease stipulation, the wells identified above will be deferred until a BLM Wyoming State Office decision is rendered (see section 2.1).

##### **4.2.2.2.1.2. Cumulative Effects**

While federal CBNG wells proposed for development within 0.5 mile of the identified bald eagle roost will be deferred, two Lancer 1 POD wells are proposed to occur within 0.5 miles on Wyoming State land.

These wells may impair the survival functions associated with the bald eagle roost site due to uncontrolled human-caused disturbance and potential bald eagle displacement.

Three Lancer 1 POD federal wells are planned to occur within one mile of the bald eagle roost location. Further, five CBNG wells are proposed to occur between 0.5 and one mile from the bald eagle roost location. Human visitation and associated disturbance during the winter roosting period could further impair bald eagle survival functions associated with the roost site.

#### **4.2.2.2.1.3. Mitigation Measures**

While BLM has no administrative control of CBNG wells and associated infrastructure planned to occur on Wyoming State land, a seasonal minimum disturbance-free buffer zone of one mile from the winter roost site will be required for three Lancer 1 POD federal wells and associated infrastructure (November 1 to April 1). These wells are TRAIN #1, MIRACLE MAKER #1, and MIRACAL MAKER #2.

#### **4.2.2.2.1.4. Residual Effects**

Residual impacts to bald eagles associated with Lancer 1 POD will accrue because wells are planned to occur on Wyoming State land within 0.5 mile (two wells), and one mile (five additional wells) of the bald eagle roost site indentified above. Impacts would occur due to human-caused disturbance and potential bald eagle displacement during the winter roosting period (November 1 to April 1).

### **4.2.2.3. Big Game**

#### **4.2.2.3.1. Direct and Indirect Effects**

Under Alternative B yearlong range for pronghorn and mule deer would be directly impacted by the construction of 10 CBNG wells and associated infrastructure (Table 2.XXX). This would result in 57.49 acres of disturbance.

In addition to the direct habitat loss, big game would likely be displaced from the project area during drilling and construction (Hiatt and Baker 198). While big game animals are expected to return to the project area following construction, continued human-caused disturbance associated with operation and maintenance may result in reduced local populations because big game may fail to habituate to the new disturbances (Lustig 2003). Habitat effectiveness for big game is anticipated to be reduced in the project area. However, the site is not mapped as crucial habitat by the Wyoming Game and Fish Department (WGFD 2009). Further information regarding direct and indirect effects to big game is provided in the PRB FEIS on pp. 4-181 to 4-215.

#### **4.2.2.3.2. Cumulative Effects**

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pg. 4-181 to 4-215.

#### **4.2.2.3.1. Mitigation Measures**

The amount of anticipated big game habitat disturbance warrants effective reclamation efforts designed to facilitate re-establishment of diverse native plant community assemblages. Please refer to Appendix A for more information regarding reclamation requirements.

### **4.2.2.4. Migratory Birds**

#### **4.2.2.4.1. Direct and Indirect Effects**

Migratory bird species that utilize the disturbed areas for nesting may be disrupted by the human activity, and nests may be destroyed by equipment. Further, construction activities will likely displace migratory birds due to construction noise (BLM 2003). Disturbance of habitat within the project area may impact migratory birds. Direct impacts to native habitats result from construction of wells, roads, and pipelines.

Prompt re-vegetation of short-term disturbance areas will help to reduce habitat impacts.

Migratory bird species within the Powder River Basin nest in the spring and early summer and are vulnerable to the same effects as sage-grouse and raptor species. Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where sage-grouse or raptor nesting timing limitations are applied, nesting migratory birds are also protected. Direct and indirect effects to migratory birds are discussed in the PRB FEIS (pp. 4-231 to 4-235).

#### **4.2.2.4.2. Cumulative Effects**

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, refer to the PRB FEIS, pg. 4-235. No additional mitigation measures are required.

#### **4.2.2.5. Raptors**

##### **4.2.2.5.1. Direct and Indirect Effects**

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 mineral activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to overheating or chilling of eggs or chicks and can result in egg or chick mortality. 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.

Well sites are planned to occur near raptor nests in several locations including 3DEVA, 1TRAN, 2TRAN, 2DEVA-COM, and 4DEVA-COM. However, these sites were inspected during the onsite visit, are located out of line of sight of raptor nests due to topography, and were deemed to have adequate biological buffers. Additional information regarding these wells can be found in the wildlife onsite notes (Lancer 1 POD Book stored at the BLM Buffalo Field Office).

Additional direct and indirect impacts to raptors, from oil and gas development, are analyzed in the PRB FEIS (pp. 4-216 to 4-221).

##### **4.2.2.5.2. Cumulative Effects**

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

##### **4.2.2.5.3. Mitigation Measures**

To reduce the risk of decreased raptor productivity or nest failure, the BLM BFO requires a 0.5 mile radius timing limitation during the breeding season (February 1st to July 31st) around active raptor nests and recommends that all infrastructure requiring human visitation be located in such a way as 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.

Raptor nests occur throughout the POD rendering almost all wells and infrastructure subject to nesting raptor timing limitations. The only exceptions are the 1-DEVA-COM and 2MIRA-COM wells. However, access roads associated with these wells fall within 0.5 miles of raptor nests and are therefore subject to the timing limitations

#### **4.2.2.5.4. Residual Impacts**

None anticipated

#### **4.2.2.6. West Nile Virus**

##### **4.2.2.6.1. Direct and Indirect Effects**

This project is likely to result in standing surface water which may potentially increase mosquito breeding habitat. BLM has consulted with applicable state agencies, County Weed and Pest and the State Health Department, per above mitigation in the PRB ROD page 18, regarding the disease and the need to treat. BLM has also consulted with the researchers that are studying the dynamics of WNV species and its effects in Wyoming.

##### **4.2.2.6.2. Cumulative Effects**

There are many sources of standing water, beyond CBM discharge, throughout the PRB that would add to the potential for mosquito habitat. Sources include; natural flows, livestock watering facilities, coal mining operations, and outdoor water use and features in and around communities.

##### **4.2.2.6.3. Mitigation Measures**

There is no evidence that treatment, either through the use of larvicides or malithion, on a site specific or basin-wide scale will have any effect on the overall spread of the disease. The State agencies have not instituted state-wide treatment for mosquitoes due to WNV, nor are they requiring any mitigation specific to permitting for CBM operations.

BLM will keep monitoring this issue by continuing to consult with the State agencies and the researchers working in the area in order to stay abreast of the most current developments and any need to apply mitigation.

##### **4.2.2.6.4. Residual Effects**

None anticipated

#### **4.2.3. Water Resources**

The operator has submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts within the Upper Powder River watershed and commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Qualified hydrologists, in consultation with the BLM, developed the water management plan. Adherence with the plan, in addition to BLM applied mitigation (in the form of COAs), would reduce project area and downstream impacts from proposed water management strategies. The proposed water management plan for the Lancer 1 POD is for the produced water to be disposed of through re-injection into the Fort Union sandstones via the existing North Butte Injector State #9 injection well. An existing off-channel lined pit located within a few hundred feet of the injection well will be used to capture any water in case of an emergency or if the injection well needs servicing.

The maximum water production is predicted to be 14.0 gpm per well or 140.0 gpm (0.31 cubic feet per second (cfs) or 224 acre-feet per year) for the 10 wells in this POD. This maximum water production does not include the four deferred wells. The PRB FEIS projected the total amount of water that was anticipated to be produced from CBNG development per year (Table 2-8 Projected Amount of Water Produced from CBM Wells under Alternatives 1, 2A and 2B pg 2-26). For the Upper Powder River drainage, the projected volume produced within the watershed area was 60,319 acre-feet in 2010 (maximum production is estimated in 2006 at 171,423 acre-feet). As such, the volume of water resulting from the production of these wells is 0.4% of the total volume projected for 2010. This volume of produced water is also within the predicted parameters of the PRB FEIS.

#### **4.2.3.1. Groundwater**

##### **4.2.3.1.1. Direct and Indirect Effects**

The PRB FEIS predicted that only 5% of the CBNG produced water would be injected into disposal wells in the Upper Powder River watershed (PRB FEIS pg 2-46). For this action, it may be assumed that a maximum of 140 gpm will be injected into the Upper Fort Union sandstones in or near the project area (224 acre feet per year). This water will mix with the Ft. Union Formation water and potentially be used for stock and domestic purposes. According to the PRB FEIS, “the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater.” (PRB FEIS pg 4-54). Therefore, the chemical nature and the volume of the discharged water may not degrade the groundwater quality. The injection well has been completed to the Upper Fort Union formation (1300 feet). The operator may re-complete the well deeper in the Fort Union (1900 to 4600 feet) if necessary to obtain the injection rates necessary to dispose of all the water produced from this and other neighboring projects. Records of the well completion have not yet been filed with the state.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is possible impacts to the groundwater. “The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers.” (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of wells in the area. The static water levels of the permitted wells within a 1 mile radius of the Lancer 1 POD, as shown in their water well permits, vary from -4 (artesian) to 400 feet. According to the permit record of these permitted water wells, they produce from depths which range from -1 (artesian) to 735 feet. The CBNG produced water is proposed to be pumped from the Big George coal seam at the 1,790 foot depth. The operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence (½ mile of a federal CBNG producing well) of the proposed wells.

Recovery of the coal bed aquifer was predicted in the PRB FEIS to “...resaturate and repressurize the areas that were partially depressurized during operations. The amount of groundwater stored within the Wasatch - Tongue River sand and coals, and sands units above and below the coals is almost 750 million acre-feet of recoverable groundwater are (PRB FEIS Table 3-5). Redistribution is projected to result in a rapid initial recovery of water levels in the coal. The model projects that this initial recovery period would occur over 25 years.” (PRB FEIS page 4-38).

##### **4.2.3.1.2. Cumulative Effects**

As stated in the PRB FEIS, “The aerial extent and magnitude of drawdown effects on coal zone aquifers and overlying and underlying sand units in the Wasatch Formation also would be limited by the discontinuous nature of the different coal zones within the Fort Union Formation and sandstone layers within the Wasatch Formation.” (PRB FEIS page 4-64).

Development of CBNG through 2018 (and coal mining through 2033) would remove 4 million acre-feet of groundwater from the coal zone aquifer (PRB FEIS page 4-65). This volume of water “...cumulatively represents 0.5 percent of the recoverable groundwater stored in the Wasatch – Tongue River sands and coals (nearly 750 million acre-feet, from Table 3-5). All of the groundwater projected to be removed during reasonably foreseeable CBNG development and coal mining would represent less than 0.3 percent of the total recoverable groundwater in the Wasatch and Fort Union Formations within the PRB (nearly 1.4 billion acre-feet, from Table 3-5).” (PRB FEIS page 4-65).

**4.2.3.1.3. Mitigation Measures**

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

**4.2.3.1.4. Residual Effects**

As described in Chapter 3.4.1, the production of CBNG in this project area has already removed some of the water saturation in the coal zones for the production of gas. There is potential that the wells will not produce the volume of CBNG water estimated due to the dewatering history in the area.

**4.2.3.2. Surface Water**

**4.2.3.2.1. Direct and Indirect Effects**

**Produced Water Quality**

Table 4.4 shows the average values of EC and SAR as measured at selected USGS gauging stations at high and low monthly flows as well as the Wyoming groundwater quality standards for TDS and SAR for Class I to Class III water (there is no current standard for EC). It also shows constituent limits for TDS, SAR and EC concentrations found in the POD’s representative water sample.

**Table 4.4 Comparison of Regulated Water Quality Parameters to Predicted Water Quality**

<b>Sample location or Standard</b>	<b>TDS, mg/l</b>	<b>SAR</b>	<b>EC, µmhos/cm</b>
Upper Powder River Watershed at Arvada, WY Gauging station			
Historic Data Average at Maximum Flow		4.76	1,797
Historic Data Average at Minimum Flow		7.83	3,400
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	8	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for UIC General Permit # 5C5-2 based on Class of Use water in Receiving Formation			
Class I	500		NA
Class II	2,000	8	NA
Class III	5,000		NA
Predicted Produced Water Quality			
Big George Coal Zone	1850	17.9	2910

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the Powder River Basin is the irrigation of crops (PRB FEIS pg 4-69). The water quality projected for this POD is 1850.0 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). However direct land application is not included in this proposal. If at any future time the operator entertains the possibility of irrigation or land application with the water produced from these wells, the proposal must be submitted as a sundry notice for separate environmental analysis and approval by the BLM.

The quality for the water produced from the Big George target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD. A maximum of 14 gallons per minute (gpm) is projected is to be produced from these 10 wells, for a total of 140 gpm for the POD.

**Produced Water Control**

To manage the produced water in the event of an emergency when the injection well is not operating, an existing off-channel pit (16.1 acre-feet volume) would be used. The off-channel pit encompasses approximately 1.6 acres including the dam structure. The pit is fully lined and fenced. The off-channel impoundment would result in evaporation of CBNG water. Criteria identified in “Off-Channel, Unlined CBNG Produced Water Pit Siting Guidelines for the Powder River Basin, Wyoming” (WDEQ, 2002) was used to locate this impoundment.

There is one existing discharge point which is located at the existing emergency pit at the injection well facilities. It has been appropriately sited and utilizes water energy dissipation designs. Existing and proposed water management facilities were evaluated for compliance with best management practices during the onsite.

In order to determine the actual water quality of the producing formations in this POD and to verify the water analysis submitted for the pre-approval evaluation, the operator has committed to designate a reference well to each coal zone within the POD boundary. The reference well will be sampled at the wellhead for analysis within sixty days of initial production. A copy of the water analysis will be submitted to the BLM Authorized Officer.

For more information, please refer to the WMP included in this POD.

**4.2.3.2.2. Cumulative Effects**

The analysis in this section includes cumulative data from Fee, State and Federal CBNG development in the Upper Powder River watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

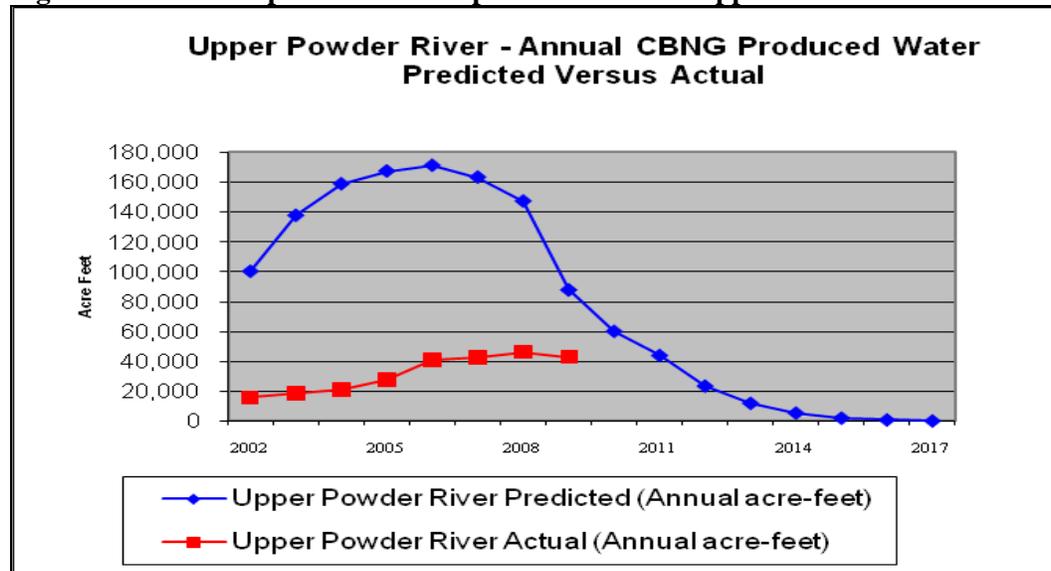
As of December 2009, all producing CBNG wells in the Upper Powder River watershed have discharged a cumulative volume of 255,531 acre-ft of water compared to the predicted 1,135,567 acre-ft disclosed in the PRB FEIS (Table 2-8 page 2-26). These figures are presented graphically in Figure 4.2 and Table 4.5 following. This volume is 22.5 % of the total predicted produced water analyzed in the PRB FEIS for the Upper Powder River watershed.

**Table 4.5 Actual vs predicted water production in the Upper Powder River watershed 2009 Data Update 04-06-10**

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2002	100,512	100,512	15,846	15.8	15,846	15.8
2003	137,942	238,454	18,578	13.5	34,424	14.4
2004	159,034	397,488	20,991	13.2	55,414	13.9

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2005	167,608	565,096	27,640	16.5	83,054	14.7
2006	171,423	736,519	40,930	23.9	123,984	16.8
2007	163,521	900,040	42,112	25.8	166,096	18.5
2008	147,481	1,047,521	45,936	31.1	212,522	20.3
2009	88,046	1,135,567	43,009	48.8	255,531	22.5
2010	60,319	1,195,886				
2011	44,169	1,240,055				
2012	23,697	1,263,752				
2013	12,169	1,275,921				
2014	5,672	1,281,593				
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				
<b>Total</b>	<b>1,285,233</b>		<b>255,531</b>			

**Figure 4.1 Actual vs predicted water production in the Upper Powder River watershed**



The PRB FEIS identified downstream irrigation water quality as the primary issue for CBNG produced water. Electrical Conductivity (EC) and SAR are the parameters of concern for suitability of irrigation water. The water quality analysis in the PRB FEIS was conducted using produced water quality data, where available, from existing wells within each of the ten primary watersheds in the Powder River Basin. These predictions of EC and SAR can only be reevaluated when additional water quality sampling is available.

As referenced above, the PRB FEIS did disclose that cumulative impacts may occur as a result of discharged produced CBNG water. The cumulative effects relative to this project are within the analysis parameters and impacts described in the PRB FEIS for the following reasons:

1. They are proportional to the actual amount of cumulatively produced water in the Upper Powder River drainage, which is approximately 22.5% of the total predicted in the PRB FEIS.
2. This project will not discharge any CBNG produced water to the surface.

Refer to the PRB FEIS, Volume 2, page 4-115 – 117 and table 4-13 for cumulative effects relative to the watershed and page 117 for cumulative effects common to all sub-watersheds.

#### **4.2.3.2.3. 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. Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.

The operator has committed to monitor the water discharge points and stream crossings for stability. If erosion or instability is noted, the operator will repair and stabilize the area using selected mitigation techniques.

#### **4.2.4. Cultural Resources**

##### **4.2.4.1. Direct and Indirect Effects**

The Lancer project is proposed within 2 miles of, and in the setting the Pumpkin Buttes TCP (48CA268). As designed, construction of all wells and associated infrastructure will result in “no adverse effect” to the setting of the Pumpkin Buttes TCP (48CA268). The determination is dependent on Yates committing to the mitigation measures described in appendices A-G of the *Programmatic Agreement between the Bureau of Land Management and the Wyoming State Historic Preservation Officer Regarding Mitigation of Adverse Effects to the Pumpkin Buttes Traditional Cultural Property from Anticipated Federal Minerals Development in Campbell County, Wyoming* (Pumpkin Buttes PA). The mitigation measures are standard BMPs intended to reduce visual contrast and will be incorporated during all phases (drilling, construction, operation, reclamation, etc) of all approved wells in the Lancer POD and their associated infrastructure (new surface disturbance to junction with existing disturbance).

As designed, the project complies with the mitigations described in the Pumpkin Buttes PA the BLM. If Yates chose to submit wider corridors for accesses and pipelines, BFO would be required to initiate formal consultation with interested tribes and the WY SHPO. The BLM agrees that the most expedient method of processing the Lancer 1 POD is by approving all wells and infrastructure as designed with corridor widths that conform to the Pumpkin Buttes PA. Accordingly, all mitigation measures as described in appendices A-G of the Pumpkin Buttes PA will be applied as COAs to the Lancer POD.

Proposed construction activities are planned near eligible prehistoric site 48CA6947. In order to prevent construction equipment from disturbing the site, a protective fence will be constructed within 100’ of the site boundary.

Following the Wyoming State Protocol Section VI(B)(1) the Bureau of Land Management determined that the project will result in an “No Adverse Effect”. The Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 08/26/10.

#### **4.2.4.2. 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 in the proposed project area serve to partially mitigate potential cumulative effects to cultural resources.

#### **4.2.4.3. Mitigation Measures**

The incorporation of the mitigation measures to reduce visual contrast as outlined in the appendices of the Pumpkin Buttes PA will result in a finding of “no adverse effect” to the Pumpkin Buttes TCP. These mitigating measures include techniques such as narrow corridor widths and a reduction of vegetation and surface disturbance.

A temporary fence will be installed during surface disturbing activities within 100’ of 48CA6947. Fencing will be placed at the edge of the site boundary closest to the activity, as delineated by the Cultural Resource Use Permittee (CRUP), to prevent inadvertent disturbance to the site. All surface disturbing activities will be monitored by the CRUP. The CRUP shall notify the BLM-BFO cultural staff no less than three days in advance of construction activities.

If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] 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).

#### **4.2.4.4. 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.

#### **4.2.4.5. Mitigation Measures**

If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] 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).

### **4.2.5. Air Quality**

#### **4.2.5.1. Direct and Indirect Effects**

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 non-CBM 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 concluded that projected oil & gas development would not violate any local, state, tribal or federal air quality standards.

**4.3. Summary of Effects**

**Table 4.6 provides a comparison of the cumulative effects associated with the alternatives.**

<b>Resource/Species</b>	<b>Alternative A</b>	<b>Alternative B</b>
Wetlands/Riparian Areas	No existing wetlands/riparian areas would be disturbed.	
<b>Wildlife</b>		
Big Game	No habitat loss or fragmentation. Would likely see increased traffic passing through due to surrounding mineral development	Greatest habitat loss.
		Greatest habitat fragmentation.
Raptors	No habitat loss.	Greatest foraging habitat fragmentation.
	No wells authorized near nests.	
Migratory Birds	No habitat loss.	Greatest habitat loss.
		Greatest habitat fragmentation.
	No habitat fragmentation.	
		Overhead electric poses predation & collision risk.
<b>Threatened and Endangered Species</b>		
Bald eagle	No habitat loss	Overhead electricity increasing mortality risk from electrocution.
<b>Sensitive Species</b>		
Greater Sage Grouse	No habitat loss.	Greatest habitat loss.
	No decision on overhead electricity. Grouse may avoid overhead power lines.	Greatest predation and collision risk associated with overhead power lines.
<b>West Nile Virus</b>	No Impact	likely to have effect on the overall spread of WNV.

**5. CONSULTATION & COORDINATION**

Agencies and individuals summarized in Table 5.1 participated in the onsite and were consulted on the proposed project to confirm compliance with applicable laws and regulations.

**Table 5.1 Consultations**

Contact	Title	Organization	Present at onsite
Jeb Tachick	Permit Agent	Yates Petroleum Corp.	Yes
Trent Knez	Drilling Foreman	Yates Petroleum Corp.	Yes
Boyd Abelseth	Hydrologist	Yates Petroleum Corp.	Yes
Brad MacKagency	Pipeline Foreman	Yates Petroleum Corp.	Yes
Gene Mankin	Landowner	T Chair Ranch	Yes
Patricia Clark	Landowner	T Chair Ranch	Yes
John Christensen	Landowner	Christensen Ranch	Yes
Debby Green	Natural Resource Specialist	BLM	Yes
Seth Lambert	Archaeologist	BLM	Yes
Stacy Gunderson	Civil Engineer	BLM	Yes
Patrick Cole	Wildlife Biologist	BLM	Yes
Keith Anderson	Hydrologist	BLM	Yes
Brad Rogers	Wildlife Biologist	USFWS	Yes

## 6. OTHER PERMITS REQUIRED

A number of other permits are required from Wyoming State and other Federal agencies. These permits are identified in Table A-1 in the PRB FEIS Record of Decision.

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## **8. LIST OF INTERDISCIPLINARY TEAM PREPARERS AND REVIEWERS**

Debby Green, Natural Resource Specialist  
Casey Freise, Supervisory Natural Resource Specialist  
Keith Anderson, Hydrologist  
Victor Xuan, Petroleum Engineer  
Kristine Phillips, Legal Instruments Examiner  
Seth Lambert, Archaeologist  
Patrick Cole, Wildlife Biologist  
Kerry Aggen, Geologist  
Chris Durham, Assistant Field Manager, Resources  
Paul Beels, Associate Field Manager, Minerals & Lands  
Duane W. Spencer, Field Manager

Interdisciplinary Team Lead: Debby Green

**APPENDIX A: CONDITIONS OF APPROVAL FOR THE APPLICATION  
FOR PERMIT TO DRILL**

POD Name: Lancer 1

Operator Name: Yates Petroleum Corporation

Field Office: Buffalo Field Office  
Address: 1425 Fort Street  
Buffalo, Wyoming 82834

Office Telephone Number: 307-684-1100

List of Wells:

	<b>Well Name</b>	<b>Well #</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>	<b>Lease #</b>
1	LANCER 1 DEVASTATOR CS	3	SWNE	26	44N	76W	WYW141237
2	LANCER 1 DEVASTATOR CS COM	1*	SWSE	23	44N	76W	WYW141237
3	LANCER 1 DEVASTATOR CS COM	2	SWSW	25	44N	76W	WYW141237
4	LANCER 1 DEVASTATOR CS COM	4	SWSE	26	44N	76W	WYW141237
5	LANCER 1 MIRACLE MAKER CS	1	NENE	22	44N	76W	WYW140806
6	LANCER 1 MIRACLE MAKER CS COM	2	SWNE	22	44N	76W	WYW140806
7	LANCER 1 TRAIN CS	1	NENW	22	44N	76W	WYW128618
8	LANCER 1 TRAIN CS	2	SWNW	22	44N	76W	WYW128618
9	LANCER 1 TRAIN CS	3	NESW	22	44N	76W	WYW128618
10	LANCER 1 TRAIN CS	4	SWSW	22	44N	76W	WYW128618

List of Impoundments:

The following water management infrastructure was inspected and approved for use in association with this POD:

	<b>FACILITY Name / Number</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>	<b>Capacity (Acre Feet)</b>	<b>Surface Disturbance (Acres)</b>	<b>Lease #</b>
1	Close Encounter Pit	NESW	16	44N	76W	16.1	2.8	State
2	North Butte Injector Well #9	NESW	16	44N	76W	1 per day	0.62	Fee

**SITE SPECIFIC**

**Surface Use**

1. 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.” The color selected for the Lancer 1 POD is Covert Green (18-0617 TPX).
2. Site specific designs were provided for five drainage crossings in sections of infrastructure that exceed maximum disturbance widths allowed under Pumpkin Buttes PA. These areas have limited reclamation potential that will require disturbed areas to be stabilized (stabilization efforts may include mulching, matting, soil amendments, etc.) in a manner which eliminates accelerated erosion until a self-perpetuating native plant community has stabilized the site in accordance with the Wyoming Reclamation Policy. Stabilization efforts shall be finished within 30 days of the initiation of construction activities. If weather or other factors outside of Yates’ control prevents the stabilization within 30 of the initiation of construction activities, Yates will notify the AO and request a modified timeline. These 5 drainage crossings are described in the MSUP, *Lancer POD Archeology Attachment* and represented on the POD Maps as follows:

1.	Pipeline crossing of the drainage to the west of the Lancer #9
2.	Pipeline crossing of the drainage to the north of the Train #2
3.	Pipeline crossing of the drainage to the north of the Train #4
4.	Pipeline crossing of the drainage to the west of the Devastator #1
5.	Pipeline crossing of the drainage to south of the Devastator #3

3. The following access road/corridor in the project area have been identified to have limited reclamation potential that will require disturbed areas to be stabilized (stabilization efforts may include mulching, matting, soil amendments, etc.) in a manner which eliminates accelerated erosion until a self-perpetuating native plant community has stabilized the site in accordance with the Wyoming Reclamation Policy. Stabilization efforts shall be finished within 30 days of the initiation of construction activities. If weather or other factors outside of Yates’ control prevents the stabilization within 30 of the initiation of construction activities, Yates will notify the AO and request a modified timeline.

Improved road access to Miracle Maker #1 in NE ¼ of Sec. 22
Improved road access through drainage west of Train #3 in SE ¼ of Sec. 22
Lancer 1 Engineered Road Section located in the NE ¼ of Sec. 21

4. Maintain a 20 foot undisturbed vegetated buffer near drainages along proposed access road north of Miracle Maker #2 in NE ¼ of Section 22.
5. Turnouts will be provided on engineered and template resource roads as outlined in the BLM Manual 9113 .45-E(7), which is every 1000’ or intervisible for single lane roads.
6. Per BLM Manual 9113 .45J - 15 mile per hour speed limit signs will be installed at the entrance and exit of the POD on the main access road to inform travelers of the speed limit and be in accordance with the Federal Highway Administration’s Manual on Uniform Traffic Control Devices. The following road will have a 10 mph design speed posted at STA: 0+00 to 5+00 to inform travelers of the reduced stopping sight distance:
  - a. Engineered Lancer 1 road located in section 21.

7. The operator is responsible for having the licensed professional engineer(s) certify that the actual construction of the roads meets the design criteria and is constructed to Bureau standards.
8. All engineered road segments must be completed, including any culverts and low water crossings before the drilling rig or other drilling equipment moves onto the pad.
9. The operator will drill seed on the contour to a depth of 0.5 inch, followed by cultivation 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:

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

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

\*PLS = pure live seed. Northern Plains adapted species

Double this rate if broadcast seeding

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

Species	% in Mix	Lbs PLS*
<i>Thickspike Wheatgrass</i> (Elymus lanceolatus ssp. lanceolatus)	30	3.6
<i>Prairie sandreed</i> (Calamovilfa longifolia)	30	3.6
<i>Indian ricegrass</i> (Achnatherum hymenoides)	25	3.0
<i>Prairie coneflower</i> (Ratibida columnifera)	5	0.6

Species	% in Mix	Lbs PLS*
<i>White or purple prairie clover</i> ( <i>Dalea candidum</i> , <i>purpureum</i> )	5	0.6
<i>Scarlet Globemallow</i> ( <i>Sphaeralcea coccinea</i> ) or <i>Blue flax</i> ( <i>Linum lewisii</i> )	5	0.6
Totals	<b>100%</b>	<b>12 lbs/acre</b>

\*PLS = pure live seed. Northern Plains adapted species

Double this rate if broadcast seeding

### Wildlife

Yates Petroleum Corporation requested that spring seeding be allowed during sage-grouse, raptor, and mountain plover nesting and breeding seasons in the Lancer 1 POD Surface Use Plan. However, BLM will only evaluate exception requests on a case by case basis. Timing limitations developed to protect nesting mountain plovers, nesting raptors, and breeding sage-grouse are important to maintain habitat function, and to ensure compliance with the Migratory Bird Treaty Act. Consequently, timing limitations will apply to the Lancer 1 POD as follows:

#### Bald Eagles:

A *seasonal* minimum disturbance-free buffer zone of 1 mile will be established for all bald eagle winter roost sites (November 1 – April 1). This buffer zone may be adjusted based on site-specific information through coordination with, and written approval from, the USFWS.

This will affect three Lancer 1 POD federal wells and associated infrastructure including TRAIN #1, MIRACLE MAKER #1, and MIRICAL MAKER #2.

A *year-round* disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) will be established for all bald eagle winter roost sites. This buffer zone may be adjusted based on site-specific information through coordination with, and written approval from, the USFWS.

#### Mountain Plover:

Please refer to mountain plover protective requirements derived from the PRB FEIS ROD (BLM 2003, pg. A-35 and A-36) under PROGRAMMATIC, below.

#### Raptors:

No surface-disturbing activity shall occur within 0.5 mile of all identified raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey. Surveys shall be conducted by a biologist following the most current BLM protocol. All survey results must be submitted in writing to the BFO and approved prior to initiation of surface-disturbing activities. A 0.5 mile timing restriction will be applied if a nest is identified as active. This timing limitation will affect all wells and infrastructure associated with the Lancer 1 POD except for the Devastator #1 and Miracle Maker #1 wells. However, access roads associated with these wells fall within 0.5 miles of raptor nests and are therefore subject to the timing limitations

1. If an undocumented raptor nest is located during project construction or operation, the Buffalo Field Office (307-684-1100) shall be notified within 24 hours.

#### Sage-Grouse:

The following conditions will reduce impacts to sage-grouse (also refer to clearance survey requirements derived from the PRB FEIS ROD (BLM 2003, pg. A-33) under PROGRAMMATIC, below):

1. No surface-disturbing activities are permitted in suitable nesting and brood-rearing habitat within the Lancer 1 CBNG POD boundary between March 1 and June 15. This timing limitation applies to the following wells and associated access roads determined through onsite inspection to support suitable nesting and brood-rearing habitat: 1DEV, 3DEV, 4DEV, 2TRAN, and 3TRAN. This condition will be implemented on an annual basis for the life of the project.
2. Should a sage-grouse lek be discovered during clearance surveys (see item #1 under PROGRAMMATIC below), the following applies: Disruptive activity is restricted on or within a 0.25 mile radius of the perimeter of occupied or undetermined sage-grouse leks from 6:00 pm to 8:00 am from March 15-May15. “Disruptive activities are those that “...require people and/or activity to be in nesting habitats for a duration of 1 hour or more during a 24 hour period...” (BLM 2009).
3. Noise from infrastructure within the POD is not to exceed 49 decibels (10 dBA above background noise) at any nearby sage grouse or sharp-tailed grouse display grounds.

### **Water**

1. Operator will need to provide the well completion information for the North Butte #9 Injection Well.

### **Cultural**

1. Per the *Programmatic Agreement between the Bureau of Land Management and the Wyoming State Historic Preservation Officer Regarding Mitigation of Adverse Effects to the Pumpkin Buttes Traditional Cultural Property from Anticipated Federal Minerals Development in Campbell County, Wyoming*; Stipulations II; Yates will instruct all employees, contractors, subcontractors and any additional parties involved with on the ground operations of their project to avoid the Pumpkin Buttes TCP.
2. Per the *Programmatic Agreement between the Bureau of Land Management and the Wyoming State Historic Preservation Officer Regarding Mitigation of Adverse Effects to the Pumpkin Buttes Traditional Cultural Property from Anticipated Federal Minerals Development in Campbell County, Wyoming*; Appendix A-G; Yates will operate under mitigation measures found in appendices A-G of the PA during all phases (drilling, construction, operation, reclamation, etc) of all approved wells in the Lancer POD and their associated infrastructure (new surface disturbance to junction with existing disturbance).
3. A temporary fence will be installed during surface disturbing activities within 100’ of 48CA6947. Fencing will be placed at the edge of the site boundary closest to the activity, as delineated by the Cultural Resource Use Permittee (CRUP), to prevent inadvertent disturbance to the site. The surface disturbing activities will be monitored by the CRUP. The CRUP shall notify the BLM-BFO cultural staff no less than three days in advance of construction activities.

### **PROGRAMMATIC**

The following programmatic mitigation measures are listed in Appendix A-5 of the PRB FEIS ROD.

Programmatic mitigation measures are those, determined through analysis, which may be appropriate to apply at the time of APD approval if site-specific conditions warrant. These mitigation measures can be applied by BLM, as determined necessary at the site-specific NEPA APD stage, as COAs and will be in addition to stipulations applied at the time of lease issuance and any standard COA.

### **Wildlife**

1. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies will conduct clearance surveys for sage grouse breeding activity during the sage grouse’s breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 mile of the proposed activities. The Companies will locate compressor stations so that noise from the stations at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.

2. Containment impoundments will be fenced to exclude wildlife and livestock. If they are not fenced, they will be designed and constructed to prevent entrapment and drowning.

#### **Threatened, Endangered, or Sensitive Species**

1. The companies will conduct clearance surveys for threatened, endangered or other special-concern species at the optimum time. Inventory for special concern species, other than federally listed species below, is contingent upon landowner concurrence. This will require coordination with the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters.

#### **Bald Eagle**

1. In the event that a bald eagle (dead or injured) is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.
2. Within ½ mile of bald eagle winter roost sites additional measures such as remote monitoring and restricting maintenance visitation to between 9:00 and 3:00 may be necessary to prevent disturbance (November 1 – April 1).
3. Additional mitigation measures may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to bald eagles or their habitat.

#### **Mountain Plover**

1. No ground-disturbing activities will occur in suitable nesting habitat prior to surveys for nesting mountain plovers conducted in compliance with the USFWS' Mountain Plover Survey Guidelines (USFWS 2002). A BLM approved biologist will conduct the surveys. Once occupied mountain plover nesting habitat is located, the BLM will initiate section 7 consultation with the USFWS on any project-related activities proposed for such habitat. The amount and nature of ground-disturbing activities will be limited within identified nesting areas in a manner to avoid the abandonment of these areas.
2. A disturbance-free buffer zone of 0.25 mile will be established around all mountain plover nesting locations between March 15 and July 31.
3. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plover will not be constructed within ¼ mile of known mountain plover nest sites.
4. Construction of ancillary facilities (for example, compressor stations, processing plants) will not be located within ½ mile of known nesting areas. The threats of vehicle collision to adult plovers and their broods will be minimized, especially within breeding aggregation areas.
5. Where possible, roads will be located outside of plover nesting areas.
6. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.

### **STANDARD**

#### **General**

1. All contractors/operators will have a complete copy of the approved APD/POD, including COAs, at the drill site, during the construction of the roads and drill pad, the drilling of the well, completion of the well, and all other related construction activities.
2. A pre-construction field meeting shall be conducted prior to beginning any dirt work approved under this POD. The operator shall contact the BLM Authorized Officer Debby Green, NRS at (307)684-1058 at least 4-days prior to beginning operations so that the meeting can be scheduled. The operator is responsible for having all contractors present (dirt contractors, drilling contractor, pipeline

contractor, project oversight personnel, etc.) including the overall field operations superintendent, and for providing all contractors copies of the approved POD, project map and BLM Conditions of Approval pertinent to the work that each will be doing.

3. Approval of this APD does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease that would entitle the applicant to conduct operations thereon. In addition, approval of this APD does not imply that the operator has legal access to the drilling location. When crossing private surface 43 CFR 3814 regulations must be complied with and when crossing public surface off-lease the operator must have an approved right-of-way.
4. Confine all equipment and vehicles to the access road(s), pad(s), and area(s) specified in the approved APD or POD.
5. The approval of this project does not grant authority to use off lease Federal lands. No surface disturbing activity, or use of off-lease federal lands, is allowed on affected leases until right-of-way grants become effective which is the date signed by the authorized officer.
6. The APDs in this POD are valid for two years from the date of approval or until the oil and gas lease expires/terminates, whichever occurs first. If this well intends to earn a lease extension, diligent operations (actual drilling) must be in progress over the lease expiration date, advance lease rentals must have been paid, and a letter stating drilling operations were in progress must be submitted to this office no later than five days past the expiration date. If the APD terminates, any surface disturbance created under the application must be reclaimed according to an approved plan.
7. The operator will be in compliance with all applicable local, state and/or federal laws, regulations, and/or statutes.
8. A progress report must be filed a minimum of once a month starting with the month the well was spudded continuing until the well is completed. The report must be filed by the 25th of each month on a Sundry Notice (Form 3160-5). The report will include the spud date, casing information such as size, grade, weight, hole size, and setting depth, amount and type of cement used, top of cement, depth of cementing tools, casing test method, intervals tested, perforated, acidized, fractured and results obtained and the dates all work done.
9. In the event abandonment of the hole is desired, an oral request may be granted by this office but must be timely followed within 5 days with a "Notice of Intention to Abandon" (Form 3160-5). The "Subsequent Report of Abandonment" (Form 3160-5) must be submitted within 30 days after the actual plugging of the well bore, reporting where the plugs were placed, and the current status of the surface restoration.
10. Whether the well is completed as a dry hole or as a producer, two copies of all logs run, core descriptions, core analysis, well-test data, geologic summaries, sample descriptions, and all other surveys or data obtained and compiled during the drilling, work over, and/or completion operations will be filed with Form 3160-4. A gamma ray log shall be run from T.D. to ground surface.
11. The operator is responsible for informing all persons associated with this project that they shall be subject to prosecution for damaging, altering, excavating or removing any archaeological, historical, or vertebrate fossil objects on site. If archaeological, historical, or vertebrate fossil materials are discovered, the operator is to suspend all operations that further disturb such materials and immediately contact the Authorized Officer. Operations are not to resume until written authorization to proceed is issued by the Authorized Officer.

12. Within five (5) working days, the Authorized Officer will evaluate the discovery and inform the operator of actions that will be necessary to prevent loss of significant cultural or scientific values.
13. The operator is responsible for the cost of any mitigation required by the Authorized Officer. The Authorized Officer will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the Authorized Officer that the required mitigation has been completed, the operator will be allowed to resume operations.
  - a. If any cultural values [sites, artifacts, human remains (Appendix L FEIS)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. The authorized officer will conduct an evaluation of the cultural values to establish appropriate mitigation, salvage or treatment. The operator is responsible for informing all persons in the area who are associated with this project that they will be subject to prosecution for knowingly disturbing historic or archaeological sites, or for collecting artifacts. If historic or archaeological materials are uncovered during construction, the operator is to immediately stop work that might further disturb such materials, and contact the authorized BLM officer (AO). Within five working days the AO will inform the operator as to:
    - whether the materials appear eligible for the National Register of Historic Places;
    - the mitigation measures the operator will likely have to undertake before the site can be used (assuming in situ preservation is not necessary); and,
    - a time-frame for the AO to complete an expedited review under 36 CFR 800.11 to confirm, through the State Historic Preservation Officer, that the findings of the AO are correct and that mitigation is appropriate. The AO will provide technical and procedural guidelines for the conduct of mitigation. Upon verification from the AO that the required mitigation has been completed, the operator will then be allowed to resume construction measures.
  - b. If paleontological resources, either large or conspicuous, and/or a significant scientific value are discovered during construction, the find will be reported to the Authorized Officer immediately. Construction will be suspended within 250 feet of said find. An evaluation of the paleontological discovery will be made by a BLM approved professional paleontologist within five (5) working days, weather permitting, to determine the appropriate action(s) to prevent the potential loss of any significant paleontological values. Operations within 250 feet of such a discovery will not be resumed until written authorization to proceed is issued by the Authorized Officer. The applicant will bear the cost of any required paleontological appraisals, surface collection of fossils, or salvage of any large conspicuous fossils of significant scientific interest discovered during the operation.
14. The operator shall be responsible for the prevention of fires on public lands caused by its employees, contractors or subcontractors. During conditions of extreme fire danger, surface use operations may be limited or suspended in specific areas.
15. All survey monuments found within the area of operations shall be protected. Survey monuments include, but are not limited to: General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U. S. Coast and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any survey monuments, the incident shall be reported in writing to the Authorized Officer.
16. If any time the facilities located on public lands authorized by the terms of the lease are no longer included in the lease (due to a contraction in the unit or other lease or unit boundary change) the BLM

will process a change in authorization to the appropriate statute. The authorization will be subject to appropriate rental, or other financial obligation determined by the authorized officer.

17. Gas produced from this well may not be vented or flared beyond an initial authorized test period of 30 days or 50 MMCF following its completion, whichever first occurs, without the prior written approval of the authorized officer. If gas is vented or flared without approval beyond the test period authorized above, you may be directed to shut-in the well until the gas can be captured or approval to continue venting or flaring as uneconomic is granted. You shall be required to compensate the lessor for that portion of the gas vented or flared without approval which is determined to have been avoidably lost.
18. The first producing well drilled to each targeted coal zone will be designated as the POD “Reference Well”. Reference wells will not be required for PODs within a 6 mile radius of the first reference well designated by the operator, nor for co-mingled coal zones. The designated reference well must be equipped to be sampled at the well head. A reference well sample will be collected from the wellhead and submitted for analysis; using the list of analytes identified in WDEQ WYPDES Application for Permit to Surface Discharge Produced Water from CBM New Discharges, Renewals, or Major Modifications, within 30 to 60 days of initial water production. Results of the analysis will be submitted to the BFO-BLM authorized Officer as they become available and will include the following information: Operator Name, POD Name, Well Name and location and Date Sampled.
19. By November 1 each year, companies will submit the following information, attached to a Sundry Form 3160-5, where construction and development have taken place in the last year.
  - Georeferenced spatial data depicting as-built locations of all facilities, wells, roads, pipelines, power lines, reservoirs, discharge points, and other related facilities to the BLM for all PODs.
  - Two as-built copies of Map D.
20. If any dead or injured threatened, endangered, proposed, or candidate species is located during construction or operation, the U.S. Fish and Wildlife Service’s Wyoming Field Office (307-772-2374), their law enforcement office (307-261-6365), and the BLM Buffalo Field Office (307-684-1100) shall be notified within 24 hours. If any dead or injured sensitive species is located during construction or operation, the BLM Buffalo Field Office (307-684-1100) shall be notified within 24 hours.
21. Operators shall comply with all other conservation measures and terms and conditions identified in the Powder River Basin Oil and Gas Project Biological Opinion (ES-6-WY-07-F012).
22. If an undocumented raptor nest is located during project construction or operation, the Buffalo Field Office (307-684-1100) shall be notified within 24 hours.

## **DRILLING AND PRODUCTION OPERATIONS**

1. The spud date will be reported electronically, (see website location above) to the Authorized Officer 24 HOURS BEFORE SPUDDING, unless otherwise required in site specific conditions of approval.

Spud Notice Site:

[http://www.wy.blm.gov/minerals/og/og\\_notices/spud\\_notice.php](http://www.wy.blm.gov/minerals/og/og_notices/spud_notice.php)

2. The operator shall complete coal bed natural gas wells (case, cement and under ream) as soon as possible, but no later than 30 days after drilling operations, unless an extension is given by the BLM Authorized Officer.

### **Well Control Equipment**

1. The well control equipment approved in this project lists the minimum requirements.
2. The flow line shall be a minimum of 30 feet from the well bore and securely anchored. The 30-foot length of line is a minimum and operators must make consideration for increasing this length for topography and/or wind direction.
3. The flow line shall be a straight run.
4. The flow line must be constructed from non-flammable material.
5. All cuttings and circulating medium shall be directed to and contained in a reserve pit.
6. The nearest edge of the pits shall be a minimum of 25' from the rig.
7. A minimum of 2' of freeboard shall be maintained in the pits at all times.
8. The authorized officer may modify these requirements at any time if it is determined that increased pressure control is deemed necessary.
9. Verbal notification shall be given to the Authorized Officer at least 24 hours before formation tests, BOP tests, running and cementing casing, and drilling over lease expiration dates.

### **Casing Program**

1. The minimum requirement for casing centralizers is as follows: all casing strings will have centralizers on the bottom three joints (i.e. a minimum of one centralizer per joint starting with the shoe joint).
2. In addition, the production casing string shall be centralized with API approved centralizers using the following specifications:
  - 2.1. One centralizer per~120' (specifically every third or fourth joint depending on joint length).
  - 2.2. One centralizer 25' above surface casing shoe.
3. Surface casing length shall follow current requirements set forth by the WOGCC. Increased surface casing may be required so that the surface casing shoe may be set into a competent formation.

### **Cement Program**

1. If there are indications of inadequate primary cementing of the surface, intermediate, or production casing strings; such as but not limited to no returns to surface, cement channeling, fallback or mechanical failure of equipment, the operator will evaluate the adequacy of the cementing operations. This evaluation will consist of running a cement bond log (CBL) or an alternate method approved by the Authorized Officer (AO) no sooner than 12 hours and no later than 24 hours from the time the cement was first pumped.
2. If the evaluation indicates inadequate cementing, the operator shall contact a BLM Buffalo Field Office Petroleum Engineer for approval of remedial cementing work. Remedial cementing will consist of, but may not be limited to:
  - 2.1. Perforating and squeezing cement to ground surface should the top of cement (TOC) be below the surface casing shoe. This shall be done within 36 hours of the completion of pumping the primary cement job.
  - 2.2. One-inching cement to ground surface should the top of cement (TOC) be above the surface casing shoe.
  - 2.3. Fallback that is found to be less than 30' from ground surface may be topped off with cement slurry.
3. The adequacy of the remedial cementing operations shall be verified by a cement bond log (CBL) or an alternate method approved by the Authorized Officer (AO). All remedial work shall be completed and verified prior to drilling out the casing shoe or perforating the casing for purposes other than remedial cementing.
4. The cement mix water used must be the same water used to develop the cement program and be of adequate quality, so as not to degrade the setting properties. Waters containing high carbonates or bicarbonates (greater than 2,000 ppm) should be avoided.

### **Production Equipment**

1. All gas measurement equipment that deviates from Onshore Order #5 (or WY NTL 2004-1 in the case of electronic flow computers) shall be approved via a Notice of Intent sundry (Form No. 3160-5) prior to installation and use. This includes any type of primary device other than a standard orifice plate meter. Requests for a variance from the minimum standards of Onshore Order #5 must list:

The specific type of equipment.

How this equipment will meet or exceed the requirements of Onshore Order #5.

The location, specific well and lease number where the equipment will be used.

2. An appropriate pressure gauge is required to be installed on each casing annulus to monitor this pressure.
3. Other actions such as off-lease measurement, commingling, allocation, etc. shall be approved via a Notice of Intent sundry (Form No. 3160-5). Submission of additional information in the POD shall not be construed as permission for these items. If the operator wishes to utilize off-lease gas measurement for wells approved in this POD, they are required to obtain approval via a Notice of Intent sundry (Form No. 3160-5) prior to any gas production. A map shall be attached to the sundry

that delineates where the individual wells will be measured for federal royalty. Unless this POD is committed to a Federal Oil & Gas Unit or Agreement, the production from all Federal wells shall be measured for Federal royalty prior to being combined with production from any other Federal, Indian, or non-Federal leases.

**Well and POD Building Identification**

1. From the time a well pad is constructed or a well is spudded (if no well pad needed), until abandonment, all well locations must be properly identified with a legible sign. The sign will include the well name and number, operator name, lease number, and the surveyed location.
2. At each POD building site where federal wells are metered, the operator is required to maintain a legible sign displayed in a conspicuous place. This sign is required to be in place at the time metering goes online. The sign shall include: POD name, Operator, Federal well names and numbers, Federal lease numbers being metered at the POD building, and surveyed location of the building.

**Protection of Fresh Water Resources**

1. All oil and gas operations shall be conducted in a manner to prevent the pollution of all freshwater resources. All fresh waters and waters of present or probable future value for domestic, municipal, commercial, stock or agricultural purposes will be confined to their respective strata and shall be adequately protected. Special precautions will be taken to guard against any loss of artesian water from the strata in which it occurs and the contamination of fresh water by objectionable water, oil, condensate, gas or other deleterious substance to such fresh water.

**Miscellaneous Conditions**

1. Any changes to the approved drilling plan and/or these conditions of approval shall be approved by the BLM-Buffalo Field Office Petroleum Engineer prior to being implemented.

After hour's numbers:

Petroleum Engineer: Matthew Warren                      Home Telephone: 307-620-0103

Petroleum Engineer: James Evans                              Home Telephone: 307-331-5421

2. If any cores are collected, a copy of all analysis performed shall be submitted to the BLM-Buffalo Field Office Petroleum Engineer.

## **SURFACE USE STANDARD**

### **A. Construction**

1. Prior to construction, the operator will remove all staking (engineered road, pads, well stakes, etc.) for those areas which were not approved with the POD/APD, except for those wells in Section 15 which have been deferred pending a waiver decision from the Wyoming state Office.
2. All roads, well pads, rig slots, culverts, spot upgrades and locations where engineered construction will occur will be completely slope staked for review prior to construction.
3. Topsoil will be segregated for all excavation including the entire disturbance area for constructed pads and excavated areas for rig leveling, reserve pits, constructed roads, spot upgrades, reservoir upgrades, outfalls and utility trenches and redistributed for interim reclamation activities. This requirement will not be applied for pipelines installed with wheel trenchers.
4. The operator will not push soil material and overburden over side slopes or into drainages. All soil material disturbed will be placed in an area where it can be retrieved without creating additional undue surface disturbance and where it does not impede watershed and drainage flows.
5. Maintain a minimum 20-foot undisturbed vegetative border between disturbance areas and the edge of adjacent drainages, unless otherwise directed by the BLM Authorized Officer.
6. Reserve pits will be adequately fenced during and after drilling operations until pit is reclaimed so as to effectively keep out wildlife and livestock. Adequate fencing, in lieu of more stringent requirements by the surface owner, is defined as follows:
  - Construction materials will consist of steel or wood posts. Three or four strand wire (smooth or barbed) fence or hog panel (16-foot length by 50-inch height) or plastic snow fence must be used with connectors such as fence staples, quick-connect clips, hog rings, hose clamps, twisted wire, etc. Electric fences will not be allowed.
  - Construction standards: Posts shall be firmly set in ground. If wire is used, it must be taut and evenly spaced, from ground level to top wire, to effectively keep out animals. Hog panels must be tied securely into posts and one another using fence staples, clamps, etc. Plastic snow fencing must be taut and sturdy. Fence must be at least 2-feet from edge of pit. 3 sides fenced before beginning drilling, the fourth side fenced immediately upon completion of drilling and prior to rig release. Fence must be left up and maintained in adequate condition until pit is closed.
7. The reserve pit will be oriented to prevent collection of surface runoff. After the drilling rig is removed, the operator may need to construct a trench on the uphill side of the reserve pit to divert surface drainage around it. If constructed, the trench will be left intact until the pit is closed.
8. The reserve pit will be lined with an impermeable liner if permeable subsurface material is encountered. An impermeable liner is any liner having permeability less than 10<sup>-7</sup> cm/sec. The liner will be installed so that it will not leak and will be chemically compatible with all substances that may be put in the pit. Liners made of any man-made synthetic material will be of sufficient strength and thickness to withstand normal installation and pit use. In gravelly or rocky soils, a suitable bedding material such as sand will be used prior to installing the liner.
9. The reserve pit will be constructed so that at least half of its total volume is in solid cut material (below natural ground level).

10. The culvert locations will be staked prior to construction. The culvert invert grade and finished road grade will be clearly indicated on the stakes. Culverts will be installed on natural ground, or on a designed flow line of a ditch. The minimum cover over culverts will be 12” or one-half the diameter whichever is greater. Drainage laterals in the form of culverts or waterbars shall be placed according to the following spacing:

<b>Soil Type</b>	<b>Road Grade 2-4%</b>	<b>Road Grade 5-8%</b>	<b>Road Grade 9-12%</b>	<b>Road Grade 13-16%</b>
Highly erosive Granitic or sandy	240	180	140	100
Intermediate Erosive clay or loam	310	260	200	150
Low erosive shale or gravel	400	325	250	175

11. Provide 4” of aggregate where grades exceed 8%. Surface material must meet requirements set forth in Wyoming Supplement to BLM Road Manual 9113.
12. The minimum diameter for culverts will be 18 inches. However, all culverts will be appropriately sized in accordance with standards in BLM Manual 9113 or at the discretion of the Authorized Officer.
13. Maximum speed on all operator-constructed and maintained roads will not exceed 25 miles per hour.
14. Pipeline construction shall not block nor change the natural course of any drainage. Pipelines shall cross perpendicular to drainages. Suspended pipelines shall provide adequate clearance for maximum runoff.
15. During construction, emissions of particulate matter from well pad and road construction would be minimized by application of water or other non-saline dust suppressants with at least 50 percent control efficiency. Dust inhibitors (surfacing materials, non-saline dust suppressants, and water) will be used as necessary on unpaved roads that present a fugitive dust problem. The use of chemical dust suppressants on public surface will require prior approval from the BLM Authorized Officer.
16. All overhead power lines will be constructed to Avian Power Line Interaction Committee (2006 edition or most recent edition) by the standards and additional standards identified in the PRB FEIS Biological Opinion (Volume 3, Appendix K, page 43).

**B. Operations/Maintenance**

1. All waste, other than human waste and drilling fluids, will be contained in a portable trash cage. This waste will be transported to a State approved waste disposal site immediately upon completion of drilling operations. No trash or empty barrels will be placed in the reserve pit or buried on location. Operators and their contractors will comply with all state and local laws and regulations pertaining to disposal of human and solid waste will be complied with.
2. Sewage shall be placed in a self-contained, chemically treated porta-potty on location.
3. The operator and their contractors shall ensure that all use, production, storage, transport and disposal of hazardous and extremely hazardous materials associated with the drilling, completion and production of these wells will be in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines. All project-related activities

involving hazardous materials will be conducted in a manner to minimize potential environmental impacts. In accordance with OSHA requirements, a file will be maintained onsite containing current Material Safety Data Sheets (MSDS) for all chemicals, compounds and/or substances which are used in the course of construction, drilling, completion and production operations.

4. Produced fluids shall be put in test tanks on location during completion work. Produced water will be put in the reserve pit during completion work per Onshore Order #7.
5. The only fluids/waste materials which are authorized to go into the reserve pit are RCRA exempt exploration and production wastes. These include:
  - drilling muds & cuttings
  - rigwash
  - excess cement and certain completion & stimulation fluids defined by EPA as exempt

It does not include drilling rig waste, such as:

- spent hydraulic fluids
- used engine oil
- used oil filter
- empty cement, drilling mud, or other product sacks
- empty paint, pipe dope, chemical or other product containers
- excess chemicals or chemical rinsate

Any evidence of non-exempt wastes being put into the reserve pit may result in the BLM Authorized Officer requiring specific testing and closure requirements.

6. Reserve pits will be closed as soon as possible, but no later than 90 days from time of drilling/well completion, unless the BLM Authorized Officer gives an extension. Pits must be dry of fluids or they must be removed via vac-truck or other environmentally acceptable method prior to backfilling, re-contouring and replacement of topsoil. Mud and cuttings left in pit must be buried at least 3-feet below re-contoured grade. The operator will be responsible for re-contouring any subsidence areas that develop.
7. The fluids and mud must be dry in the reserve pit before re-contouring pit area. The operator will be responsible for re-contouring of any subsidence areas that develop from closing a pit before it is completely dry. The plastic pit liner (if any) will be cut off below grade and properly disposed of at a state authorized landfill before beginning to re-contour the site.
8. The operator will be responsible for prevention and control of noxious weeds and weeds of concern on all areas of surface disturbance associated with this project (well locations, roads, water management facilities, etc.) Use of pesticides shall comply with the applicable Federal and State laws.
9. Prior to the use of pesticides on public land, the holder shall obtain from the BLM authorized officer a pesticide use permit (PUP). The PUP must include a written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer to such use.

### **C. Producing Well**

1. Landscape those areas not required for production to the surrounding topography as soon as possible.

The fluids and mud must be dry in the reserve pit before re-contouring pit area. The operator will be responsible for re-contouring and reseeding of any subsidence areas that develop.

2. Any spilled or leaked oil, produced water or treatment chemicals must be reported in accordance with NTL-3A and immediately cleaned up in accordance with BLM requirements. This includes clean-up and proper disposition of soils contaminated as a result of such spills/leaks.
3. Distribute stockpiled topsoil evenly over those areas not required for production (ie., cut/fill slopes, road ditches, pipelines, etc.) and reseed with approved seed mix.
4. Upgrade and maintain access roads and drainage control (e.g., culverts, drainage dips, ditching, crowning, surfacing, etc.) as necessary and as directed by the BLM Authorized Officer to prevent soil erosion and accommodate safe, environmentally-sound access.

#### **D. Reclamation/Dry Hole**

1. BLM will not release the performance bond until all disturbed areas associated with the APD/POD have been successfully revegetated (evaluation will be made after the second complete growing season) and has met all other reclamation goals of the surface owner and surface management agency.
2. A Notice of Intent to Abandon and a Subsequent Report of Abandonment must be submitted for abandonment approval.
3. For performance bond release approval, a Final Abandonment Notice (with a surface owner release letter on split-estate) must be submitted prior to a final abandonment evaluation by BLM.
4. Phased reclamation plans will be submitted to BLM for approval prior to individual POD facility abandonment via a Notice of Intent (NOI) Sundry Notice. Individual facilities, such as well locations, pipelines, discharge points, impoundments, etc. need to be addressed in these plans as they are no longer needed. Individual items that will need to be addressed in reclamation plans include:
  - Configuration of reshaped topography, drainage systems, and other surface manipulations
  - Waste disposal
  - Revegetation methods, including specific seed mix (pounds pure live seed/acre) and soil treatments (seedbed preparation, fertilization, mulching, etc.). On private surface, the landowner should be consulted for the specific seed mix.
  - Other practices that will be used to reclaim and stabilize all disturbed areas, such as water bars, erosion fabric, hydro-mulching, etc.
  - An estimate of the timetables for beginning and completing various reclamation operations relative to weather and local land uses.
  - Methods and measures that will be used to control noxious weeds, addressing both ingress and egress to the individual well or POD.
  - Decommissioning/removal of all surface facilities
  - Closure and reclamation of areas utilized or impacted by produced CBNG water, including discharge points, reservoirs, off-channel pits, land application areas, livestock/wildlife watering facilities, surface discharge stream channels, etc.
  - Refer to *BLM Impoundment Reclamation Guidance* for further information on reclaiming impoundments.
  - Refer to the *Wyoming Reclamation Policy* for further guidance on reclamation.
5. All disturbed lands associated with this project, including the pipelines, access roads, water

management facilities, etc will be reclaimed and reseeded within 180 days of well plugging. The reclamation work must be in accordance with the surface use plan and any pertinent site-specific COAs.

6. Disturbed lands will be re-contoured back to conform with existing undisturbed topography. No depressions will be left that trap water or form ponds.
7. The fluids and mud must be dry in the reserve pit before re-contouring pit area. The operator will be responsible for re-contouring of any subsidence areas that develop from closing a pit before it is completely dry. The plastic pit liner (if any) will be cut off below grade and properly disposed of at a state authorized landfill before beginning to re-contour the site.
8. Before the location has been reshaped and prior to redistributing the topsoil, the operator will rip or scarify the drilling area and access road on the contour to 4” below the compacted layer. The rippers are to be no farther than 24 inches apart.
9. Distribute the topsoil evenly over all disturbed areas. Prepare the seedbed and seed with approved seed mix.
10. Soil fertility testing and the addition of soil amendments may be required to stabilize some disturbed lands.
11. Any mulch utilized for reclamation needs to be certified weed free.
12. Waterbars are to be constructed at least one (1) foot deep, on the contour with approximately two (2) feet of drop per 100 feet of waterbar to ensure drainage, and extended into established vegetation. All waterbars are to be constructed with the berm on the downhill side to prevent the soft material from silting in the trench. The initial waterbar should be constructed at the top of the backslope. Subsequent waterbars should follow the following general spacing guidelines:

Slope (percent)	Spacing Interval (feet)
< 2	200
2 - 4	100
4 - 5	75
> 5	50

**Appendix B: Resource and Species Worksheets** Affected Resources Worksheet

<b>Resource</b>	<b>Resource Present</b>	<b>Resource Affected</b>	<b>PRB FEIS Sufficient</b>	<b>Notes</b>
<b>Air quality</b>	Y	Y	Y	PRB FEIS: 3-291-298, 4-404-406, 4-377-386
<b>Cultural</b>				PRB FEIS: 3-206-228, 4-273-288, 4-394
Native American religious concerns	Y	Y	N	PRB FEIS: 3-218-219, 3-228, 4-277-278
Traditional Cultural Properties	Y	Y	N	PRB FEIS: 3-218-219, 4-277-278
<b>Mineral Potential</b>				PRB FEIS: 3-66-70, 3-230, 4-127-129
Coal	N	N	Y	PRB FEIS: 3-66
Fluid Minerals	Y	Y	Y	PRB FEIS 3-68-69
Locatable Minerals	Y	Y	N	Addressed in EA (Insitu uranium)
Other leasables	N	N	Y	
Salable minerals	N	N	Y	
<b>Paleontology</b>				PRB FEIS: 3-65-66, 4-125-127
PFYC 3	Y	N	Y	PRB FEIS: 3-65-66, 4-125-127
PFYC 5	Y	N	Y	PRB FEIS: 3-65-66, 4-125-127
<b>Rangeland management</b>				Not in PRB FEIS
Existing range improvements	N	N	n/a	
Proposed range improvements	N	N	n/a	
<b>Recreation</b>				PRB FEIS: 3-263-273, 4-319-328
Developed site	N	N	Y	PRB FEIS: 3-266, 4-326
Walk-in-Area	N	N	Y	
<b>Social &amp; Economic</b>	Y	N	Y	PRB FEIS: 3-275-289, 4-336-370
<b>Soils &amp; Vegetation</b>				PRB FEIS: 3-78-107, 4-134-152, 4-153-164, 4-393-394, 4-406
Erosion Hazard	Y	Y	N	PRB FEIS: 3-82, 4-135
Poor Reclamation Potential	Y	Y	N	PRB FEIS: 3-86, 4-149-152
Slope hazard	Y	Y	N	PRB FEIS: 3-81, 4-135
Forest products	N	N	Y	
Prime and Unique Farmland	N	N	Y	
Invasive Species	Y	Y	N	PRB FEIS: 3-103-108, 4-153-172
Wetlands/Riparian	Y	N	Y	PRB FEIS: 4-117-124, 3-108-113, 4-172-178, 4-406
<b>Special Designations</b>				
Proposed ACEC	N	N	N	

<b>Resource</b>	<b>Resource Present</b>	<b>Resource Affected</b>	<b>PRB FEIS Sufficient</b>	<b>Notes</b>
Wild & Scenic River	N	N	N	PRB FEIS: 3-273
Wilderness Characteristics/Citizen Proposed	N	N	N	
WSA	N	N	N	
<b>Visual Resources</b>				PRB FEIS: 3-252-263, 4-302-314, 4-403
Class II	N	N	N	
Class III	Y	Y		VCR completed in Cultural for Buttes area
<b>Water</b>				PRB FEIS: 3-1-56, 4-1-122, 4-135, 4-33, 4-405
Floodplains	Y	Y	Y	
Ground water	Y	Y	Y	PRB FEIS: 3-1-30, 4-1-69, 4-392, 4-405
Surface water	Y	N	Y	PRB FEIS: 4-85-86, 4-117-124, 3-36-56. 4-69-122, 4-393, 4-405
Drinking water	Y	Y	Y	PRB FEIS: 3-52, 4-50-52
<b>Wildland Urban Interface</b>	N	N		
<b>Wildlife</b>	Y	Y	Y	PRB FEIS: 3-113-153, 4-179, 4-247, 4-397
ESA listed, proposed, or candidate species	Y	Y	N	
BLM sensitive species	Y	Y	N	
General wildlife	Y	Y	N	
West Nile virus potential	Y	N	Y	

**APPENDIX C:**

**PROGRAMMATIC AGREEMENT  
BETWEEN  
THE BUREAU OF LAND MANAGEMENT  
AND THE WYOMING STATE HISTORIC PRESERVATION OFFICER  
REGARDING MITIGATION OF ADVERSE EFFECTS TO THE PUMPKIN BUTTES TRADITIONAL  
CULTURAL PROPERTY FROM ANTICIPATED FEDERAL MINERALS DEVELOPMENT  
CAMPBELL COUNTY, WYOMING**

WHEREAS, Federal oil and gas leaseholders have submitted numerous applications to drill oil and gas wells and construct infrastructure corridors, access roads and associated facilities on federally owned subsurface minerals overlain by private surface lands in the vicinity of the Pumpkin Buttes Traditional Cultural Property; and

WHEREAS, Federal uranium leaseholders will submit plans of operation to construct in-situ uranium wells, infrastructure corridors, access roads and associated facilities on federally owned subsurface minerals overlain by private surface lands in the vicinity of the Pumpkin Buttes Traditional Cultural Property; and

WHEREAS, the BLM has determined that the development of oil, gas and in-situ uranium wells, infrastructure corridors, access roads and other facilities are assumed to have an adverse effect to the contributing integrity of setting, feeling and association for the Pumpkin Buttes Traditional Cultural Property determined eligible for listing in the National Register of Historic Places under Criteria “a” and “b” where the full extent of that disturbance is not known; and

WHEREAS, the BLM has consulted with the Wyoming State Historic Preservation Officer (SHPO) pursuant to the State Protocol between the Wyoming BLM State Director and the Wyoming State Historic Preservation Officer; and

WHEREAS, this undertaking does not meet thresholds for review by the Advisory Council on Historic Preservation identified in the *Programmatic Agreement Among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in which BLM Will Meet its Responsibilities Under the National Historic Preservation Act (1997)* “Hereinafter “National Programmatic Agreement”; and

WHEREAS, the BLM invited the Blackfeet, Cheyenne River Sioux, Crow, Eastern Shoshone, Fort Peck, Mandan, Hidatsa and Arikara Nation, Northern Arapaho, Northern Cheyenne and Oglala tribes to participate in consultation and to be consulting parties for the resolution of adverse effects to the Pumpkin Buttes, but the tribes chose not to officially comment on this agreement; and

WHEREAS, the National Programmatic Agreement, STATE PROTOCOL Between the Wyoming BLM State Director and the Wyoming State Historic Preservation Officer (hereinafter “State Protocol”), executed on March 8, 2006, is incorporated herein by reference; and

WHEREAS, the State of Wyoming and the SHPO do not waive their sovereign immunity by entering into this PA, and each fully retains all immunities and defenses provided by law with respect to any action based on or occurring as a result of this PA;

WHEREAS, there are existing Memoranda of Agreement resolving adverse effects to the Pumpkin Buttes TCP from the Dry Willow I POD and the Savageton 3 and 4 POD, and these agreements will not be altered upon the signature of this document;

NOW, THEREFORE, BLM and SHPO agree that construction of all energy development related federal undertakings within two miles of the Pumpkin Buttes Traditional Cultural Property shall be implemented in accordance with the following stipulations in order to take into account the effects these projects will have on the Pumpkin Buttes Traditional Cultural Property.

## STIPULATIONS

The BLM shall ensure that the following mitigation measures are implemented:

### I. Discoveries

A. If any cultural materials are discovered during construction, work in the area shall halt immediately, the BLM must be contacted, and the materials evaluated by a BLM-permitted archaeologist. Work may not resume until authorized by the BLM.

B. If Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered as a result of a BLM undertaking on BLM surface, the BLM will comply with Section 3 of the Native American Graves Protection and Repatriation ACT (NAGPRA) and its implementing regulations at 43 CFR Part 10. If Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are encountered as a result of a BLM undertaking on private surface, the remains will be evaluated as a historic property and procedures outlined in the State Protocol relating to identification and effect will be followed. Existing state and local laws will be followed pertaining to the discovery of Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony on private surface. The Powder River Basin Oil and Gas Project Final Environmental Impact Statement Standard Condition of Approval (General)(A)(1) regarding accidental discovery will apply to any coalbed methane POD related undertaking.

### II. Inadvertent Effects

All operators who are issued energy related permits under this PA will instruct all employees, contractors, subcontractors and any additional parties involved with on the ground operations of their projects to avoid the Pumpkin Buttes TCP. A condition of approval will be written for each POD that will specifically instruct the operator to avoid the TCP.

### III. Site Specific Mitigation

A. Mitigation measures that a project submitted to BFO by energy related permit applicants must adhere to in order to operate under this PA are located in the Appendices portion of this document. If the applicant can design their project to meet the mitigations and COA's described in this PA, full consultation between the BLM, SHPO, and tribes will not be necessary. BLM will notify the SHPO and tribes that the project meets the requirements of this PA before BLM issuance of the federal minerals development related permit. If the project cannot be modified to meet the mitigation measures outlined in this agreement, BLM will consult with the SHPO as outlined in the State Protocol.

B. No development will occur on the tops or side of the buttes. The Pumpkin Buttes' tops and bases are defined as follows, based on 1:24,000 USGS Topographic Quadrangles for the area:

North Butte:	top = 6,020 foot contour line, base = 5,280
North Middle Butte:	top = 6,000 foot contour line, base = 5,500
South Middle and Indian Buttes:	top = 5,920 foot contour line, base = 5,500
South Butte:	top = 5,960 foot contour line, base = 5,580

C. For all activities associated with any future project modification of the federal undertaking, the operator must obtain authorization from the BLM before ground disturbance can take place. The operator and the BLM may implement measures to reduce the visual contrast for any changes to the project. If the project cannot be modified to meet the mitigation measures outlined in this agreement,

BLM will consult with the SHPO as outlined in the State Protocol.

D. Prior to the BLM authorization of additional construction activities, the operator will:

1. Perform a Class III cultural resource inventory, biological, and/or other inventory, as required;
2. Submit detailed construction plans including site-specific applications (as in a Plan of Development); and
3. Participate in an on-site evaluation.

E. Management practices for the operator will adhere to all conditions included with the leases in addition to all federal and state laws and regulations. According to BLM IM No. 2004-194, best management practices shall be considered in nearly all circumstances. Mitigation measures incorporating standard measures to reduce visual contrast are included in the appendices.

#### IV. Dispute Resolution

A. If there is an objection by any Signatory to the manner in which the terms of this PA are implemented, the objecting Signatory will notify the Field Manager in writing of the objection. The Field Manager will notify all other Signatories of the objection. All Signatories will consult to resolve the objection.

B. Resolution of the objection will be documented in a written amendment to this PA to be signed by all Signatories. If a Signatory fails to respond within 30 days of receipt of the written amendment, concurrence with the amendment will be assumed by other Signatories and the amendment will go into effect. If resolution of the objection does not require amendment to the PA, this decision will be documented in writing and provided to all Signatories.

C. If the objection cannot be resolved among the Signatories, the matter shall be referred to the BLM State Director. The BLM State Director may consult with the BLM Preservation Board on the matter. The BLM State Director will notify all Signatories and Concurring Parties of the recommendations of the BLM Preservation Board. Within 15 days of notification, any Signatory may request consultation among all Signatories regarding the recommendations of the BLM Preservation Board. The final decision for resolution of the objection by any Signatory shall be made by the BLM State Director.

D. The BLM Field Manager shall consider non-signatory objections to the manner in which the terms of the PA are implemented. If the objection cannot be resolved to the satisfaction of the BLM and the objecting party, the BLM Field Manager shall request the Signatories to provide their opinion on the matter. Prior to making a final decision on the matter, the BLM Field Manager shall take into account all the Signatory opinions received within 15 days of the request.

F. Nothing in this Section shall be construed or interpreted as a waiver of any judicial remedy that would be available to any party to this PA.

#### V. Amendment

Any Signatory to this agreement may request that the other Signatories consider amending it if circumstances change over time and/or warrant revision of this PA. Except in the case of amendments addressing resolution of disputes pursuant to Section IV of this PA, amendments shall be executed in writing and shall be signed by all signatories in the same manner as the original PA.

#### VI. Annual Report and Review

- A. In concurrence with the annual State Protocol report, the Buffalo Field Office shall prepare and provide an annual report detailing how the applicable terms of the PA are being implemented. The report will include an assessment of the effectiveness of reclamation practices described in

Appendix A of this PA. The report will also suggest additional work that may be needed in order to better meet reclamation goals.

- B. The Buffalo Field Office shall provide a copy of the annual report to all signatories to this PA. The Buffalo Field Office will also provide to all signatories the opportunity to provide comment on the annual report.

#### VII. Termination

- A. Any Signatory to this PA may initiate termination by providing written notice to the other parties of their intent. After notification by the initiating Signatory, the remaining Signatories shall have 60 business days to consult to seek agreement on amendments or any other actions that would address the issues and avoid termination. If such consultation fails, the termination will go into effect at the end of the 60-day period, unless all the Signatories agree to a longer period.
- B. In the event of termination, the BLM shall refer to the Wyoming State Protocol to address any remaining adverse effects to historic properties treated under this agreement.

#### VIII. Sunset Terms

- A. This PA will remain in effect for 5 years.
- B. The BLM will ensure the PA will be reevaluated every year by all Signatories, or until the Agreement has been terminated or fully complied with.

#### **General Provisions**

- A. **Entirety of Agreement.** This PA, consisting of fourteen pages including appendices A through G represents the entire and integrated agreement between the parties and supersedes all prior negotiations, representations and agreements, whether written or oral.
- B. **Prior Approval.** This PA shall not be binding upon any party unless this PA has been reduced to writing and signed by all Signatories before performance begins as described under the terms of this PA.
- C. **Severability.** Should any portion of this PA be judicially determined to be illegal or unenforceable, the remainder of the PA shall continue in full force and effect, and any party may renegotiate the terms affected by the severance.

Execution of this Memorandum of Agreement and implementation of its terms is evidence that the BLM has taken into account the effects of future federal minerals related development on the setting of the Pumpkin Buttes TCP..

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**Signatures.** In witness whereof, the parties to this PA through their duly authorized representatives have executed this PA on the days and dates set out below, and certify that they have read, understood, and agreed to the terms and conditions of this PA as set forth herein.

The effective date of this PA is the date of the last signature affixed to this page.

**SIGNATORIES**

Bureau of Land Management, Buffalo, Wyoming Field Office

\_\_\_\_\_ Date \_\_\_\_\_  
Chris Hanson, Field Manager

Bureau of Land Management, Wyoming State Office

\_\_\_\_\_ Date \_\_\_\_\_  
Bill Hill, Deputy State Director, Resource Policy and Management

Wyoming State Historic Preservation Office

\_\_\_\_\_ Date \_\_\_\_\_  
Mary Hopkins, Interim State Historic Preservation Officer

Wyoming Attorney General's Office

\_\_\_\_\_ Date \_\_\_\_\_  
Donald Gerstein, Senior Assistant Attorney General

**APPENDIX A**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS SURFACE RECLAMATION**

A. The operator will follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231) specifically the following:

1. The reclaimed area shall be stable and exhibit none of the following characteristics:
  - a. Large rills or gullies.
  - b. Perceptible soil movement or head cutting in drainages.
  - c. Slope instability on, or adjacent to, the reclaimed area in question.
2. The soil surface must be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt. Additional short-term measures, such as the application of mulch, shall be used to reduce surface soil movement.
3. Vegetation canopy cover (on unforested sites), production and species diversity (including shrubs) shall approximate the surrounding undisturbed area. The vegetation shall stabilize the site and support the planned post disturbance land use, provide for natural plant community succession and development, and be capable of renewing itself. This shall be demonstrated by:
  - a. Successful onsite establishment of species included in the planting mixture or other desirable species.
  - b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
4. The reclaimed landscape shall have characteristics that approximate the visual quality of the adjacent area with regard to location, scale, shape, color and orientation of major landscape features.

B. All disturbed lands associated with this project, including the pipelines, access roads, water management facilities, etc. will be expediently reclaimed and reseeded in accordance with the surface use plan and any pertinent site-specific Conditions of Approval (COAs).

Areas not needed for production operations will be reshaped to approximate original contour of adjacent undisturbed surface. Topsoil will be spread evenly over reclaimed areas and drill seeded.

Disturbed areas will be drill seeded on the contour to a depth of 0.5 inch, followed by cultipaction to compact the seed preventing soil and seed losses. To maintain quality and purity, the current year's tested, certified seed with a minimum germination rate of 80% and a minimum purity of 90% will be used.

Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed. Fall seeding will occur after September 15 and prior to prolonged ground frost. To be effective, spring seeding will occur after the frost has left the ground and prior to May 15, unless prohibited by other stipulations preventing operations during these times, such as stipulations to protect wildlife habitat.

**APPENDIX B**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS ACCESS ROADS**

Wherever possible, existing roads will be utilized. Two types of roads may be constructed for energy related projects within 2 miles of the Pumpkin Buttes:

- a. BLM temporary roads defined as two-track roads with minor upgrades (including installation of underground utilities associated with production), and
- b. BLM resource roads which are surfaced and provide all-season access (including the installation of underground utilities associated with production).

In general, temporary roads will be single-lane roads with minimal disturbance. They are intended for dry weather use and will be returned to a near natural condition upon completion of use. The running surface for temporary roads will not exceed 12 feet. Total width of disturbance for temporary roads including utility lines (see Appendix C) will be limited to 20 feet in level areas and 32 feet in areas with side slopes.

The running surface of BLM resource roads will not exceed 16 feet. The gravel surface of resource roads must be a color that does not create a visual contrast with the surrounding topography. The width of total disturbance for resource roads will not exceed 40 feet (including buried utility lines) unless specific road designs indicate otherwise and the wider disturbance area does not create more than a moderate visual contrast.

In order to minimize visual contrast, pipelines are to be coridored immediately next to or within roads (see Appendix C). Where possible, roads will be placed outside areas containing dense patches of sagebrush to avoid visual contrast. All roads should follow natural contours, rather than creating straight lines.

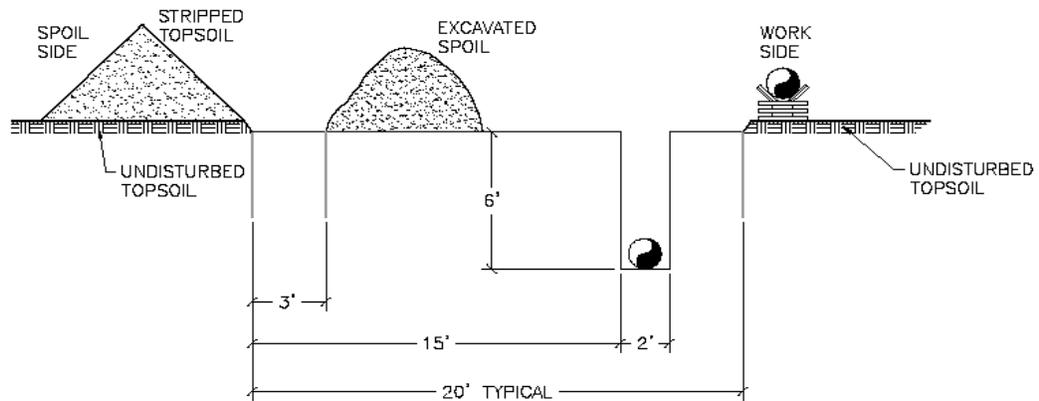
**APPENDIX C**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS GATHERING PIPELINES**

Within two miles of the Pumpkin Buttes, all energy projects with associated gathering pipelines will be corrored next to or within roads, wherever possible. Existing disturbance should be used for pipeline corridors where possible.

To install utilities, trenching must be performed and thus the topsoil will be disturbed at each location. The typical width of disturbance on level ground is 20 feet, and on side slopes, 32 feet, for temporary roads. These disturbance areas are dual purpose, allowing the installation of roads and construction of pipelines. Operators may perform the initial grading for the pipeline prior to drill rig access and subsequently install the pipeline on a site-specific basis.

Figure 1 demonstrates the typical pipeline installation process on level ground. Topsoil from a typical width of 20 feet is salvaged and placed on the non-working side of the corridor for later reclamation. A trench is then excavated and spoil is placed on the non-working side but segregated from the topsoil. On the working side of the corridor, pipe fusion activities, equipment travel, and utility installation occurs on the undisturbed ground as long as the remaining topsoil is undamaged. There will be instances on the working side where small areas of ruts or uneven ground will be groomed to facilitate the safe passage of equipment. After the utilities are installed, spoil is placed back into the trench and the topsoil is redistributed over the disturbed corridor before reseeding.

**Figure 1: Typical Pipeline Construction for Level Ground**



In order to safely operate trenching equipment, the ground should be level. Figure 2 demonstrates the typical pipeline installation process in a side hill situation. Topsoil from a typical width of 32 feet is salvaged and placed on the non-working side of the corridor for later reclamation. Before trenching, a level travel way is cut into the side slope – balancing the cut to the downhill fill. Spoil is again placed on the non-working side with the topsoil and work activities occurring on the opposite side of the corridor on the leveled surface. When work is completed, the trench is filled and the ground is contoured back as close to original as possible before topsoil is redistributed and the ground is reseeded.

**APPENDIX C**  
**PROGRAMMATIC AGREEMENT**  
**BETWEEN**  
**THE BUREAU OF LAND MANAGEMENT**  
**AND THE WYOMING STATE HISTORIC PRESERVATION OFFICER**  
**REGARDING MITIGATION OF ADVERSE EFFECTS TO THE PUMPKIN BUTTES TRADITIONAL CULTURAL PROPERTY**  
**FROM ANTICIPATED FEDERAL MINERALS DEVELOPMENT**

**APPENDIX D**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS WELL LOCATIONS**

- A. Coalbed Methane Well Locations: Within two miles of the base of the Pumpkin Buttes, no well pads will be constructed for coalbed methane wells, unless there are no other feasible locations. Wherever possible, areas of existing disturbance will be used. In order to minimize visual contrast, coalbed methane wells will not be placed in areas of dense sage brush or other vegetation unless absolutely necessary. Brush hogging or other vegetation removal on drilling locations within areas of dense sage brush or other vegetation will be feathered to reduce visual contrast and limited to a maximum of 125 feet in diameter. All above ground infrastructure related to well production (frost box, meter, fencing, etc.) will be painted in a color that best blends in with the surrounding topography. These colors are typically Covert Green (PANTONE for Architecture Color Guide 18-0617 TPX) or Carlsbad Canyon (Munsell Soil Color 2.5Y 6/2). It may be determined that different colors are required on a site specific determination based on a visual assessment. Additional concealment measures such as the creation of earth berms or placement of vegetation may be required to screen well locations.
- B. Conventional Oil and Gas Well Locations: Within two miles of the base of the Pumpkin Buttes for conventional oil or gas wells, wherever possible, areas of existing disturbance should be used. In order to minimize visual contrast, well locations will not be placed in areas of dense sage brush or other vegetation unless absolutely necessary. Brush hogging or other vegetation removal on drilling locations within areas of dense sage brush or other vegetation will be feathered to reduce visual contrast and limited to a maximum of 50 feet from the edge of the constructed pad. All above ground infrastructure related to well production will be painted in a color that best blends in with the surrounding topography. These colors are typically Covert Green (PANTONE for Architecture Color Guide 18-0617 TPX) or Carlsbad Canyon (Munsell Soil Color 2.5Y 6/2). It may be determined that different colors are required on a site specific determination based on a visual assessment. All gravel surfacing on pad locations must be a color that does not create a visual contrast with the surrounding topography. Additional concealment measures such as the creation of earth berms or placement of vegetation may be required to screen well locations.
- C. *In-Situ* Uranium Well Locations: Within two miles of the base of the Pumpkin Buttes for *in-situ* uranium mines, wherever possible, areas of existing disturbance should be used. In order to minimize visual contrast, wells locations will not be placed in areas of dense sage brush or other vegetation unless absolutely necessary. Brush hogging or other vegetation removal on drilling locations within areas of dense sage brush or other vegetation will be feathered to reduce visual contrast and limited to a maximum of 30 feet in diameter. All above ground infrastructure related to well production will be painted in a color that best blends in with the surrounding topography. These colors are typically Covert Green (PANTONE for Architecture Color Guide 18-0617 TPX) or Carlsbad Canyon (Munsell Soil Color 2.5Y 6/2). It may be determined that different colors are required on a site specific determination based on a visual assessment.

**APPENDIX E**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS PROPOSED POWER LINES**

- A. Within one mile of the base of the Pumpkin Buttes, power lines servicing wells will be buried. Wherever possible, areas of existing disturbance should be used. Buried power lines will be placed inside, or within 5 feet of, the trench utilized for pipelines when possible. Construction of overhead power lines between one mile and two miles from the base of the Pumpkin Buttes will be designed to reduce visual contrast.

**APPENDIX F**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS WATER DISCHARGE**

Reservoirs within two miles of the base of the Pumpkin Buttes can create a strong visual contrast. A visual analysis (completion of a visual contrast rating form) will be performed for each planned reservoir within two miles of the Pumpkin Buttes to determine the degree of visual contrast. If a reservoir creates a strong visual contrast, it will either not be permitted, or will be modified or relocated so it creates a moderate visual contrast or less.

**APPENDIX G**  
**SITE SPECIFIC MITIGATION MEASURES TO ADDRESS OTHER FACILITIES**

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 color will simulate the standard environmental colors established by the BLM for visual resource management. These colors are typically Covert Green (PANTONE for Architecture Color Guide 18-0617 TPX) or Carlsbad Canyon (Munsell Soil Color 2.5Y 6/2). It may be determined that different colors are required on a site specific determination based on a visual assessment.

Gravel: All gravel surfaces associated with any part of a project within two miles of the base of the Pumpkin Buttes must be a color that does not create a visual contrast with the surrounding topography.

Staging areas: The removal of large areas vegetation can create a strong visual contrast. Unless a staging area can be placed completely in existing disturbance or in grassy area that does not contain dense sage or other vegetation, it will not be permitted within two miles of the base of the Pumpkin Buttes.

Compressors: Since they can create a strong visual contrast and create auditory distractions, compressors will not be approved within two miles of the base of the Pumpkin Buttes.