DECISION RECORD
FOR Yates Petroleum Corporation, Napier Road POD
ENVIRONMENTAL ASSESSMENT (EA) –WY-070-EA10-280
Bureau of Land Management, Buffalo Field Office

DECISION:
I approve Yates Petroleum Corporation (Yates or Operator) Napier Road coalbed natural gas (CBNG) plan of development (POD) as described in Alternative C of the environmental assessment (EA) WY-070-11-280. This approved POD includes: 48 CBNG and 3 water injection applications for permit to drill (APDs), a water management plan (WMP), 2 rights-of-way (ROW), and associated infrastructure, and supports the finding of no significant impact for this project and its EA.

Compliance
This decision complies with:
- Federal Land Policy and Management Act of 1976 (FLPMA) (43 USC 1701).
- Mineral Leasing Act of 1920 (30 U.S.C. 181) and 43 CFR Part 3160 to include On Shore Order No. 1.
- National Environmental Policy Act of 1969 (NEPA) (42 USC 4321).
- Migratory Bird Treaty Act (MBTA) (16 USC 703).
- Buffalo Final Environmental Impact Statement (FEIS) (1985), and FEIS for the Powder River Basin (PRB) Oil and Gas Project, 2003.
- Buffalo Resource Management Plan (RMP), 1985, Amendments 2001, 2003.
- Update of the Bureau of Land Management (BLM), Wyoming, Sensitive Species List, (WY-IM-2010-027), Apr 2010.
- U.S. Department of Interior Order (USDI) 3310, (2010); BLM Manuals 6301; 6302; and 6303 (2011).

The Selected Alternative
BLM's decision approves Alternative C as described in the EA and the EA's mitigation measures and COAs. A summary of the approval follows. The detailed project description, including changes made at the onsites, and site-specific mitigation measures, is included in the EA.

Approvals:
Well Sites:
I approve the following 48 CBNG and 3 water injection APDs and associated infrastructure:

No	Well Name	Well #	Qtr/Qtr	Section	Township	Range	Lease
1	Schofield CS Federal	1	SWNE	11	47	75	WYW132922
2	Schofield CS Federal	2	NESE	11	47	75	WYW132922
3	Cubicle CS Federal Com	1	NESW	7	47	75	WYW145186
4	Napier Road CS Federal	1	SWSE	11	47	75	WYW108587
5	Napier Road CS Federal	2	NENE	11	47	75	WYW108587
6	Hamlet CS Federal Com	1	SWNW	11	47	75	WYW150756
7	Hamlet CS Federal Com	2	NENW	14	47	75	WYW150756
8	Mahalo CS Federal Com	1	SWNE	6	47	75	WYW130081
9	Mahalo CS Federal	2	NESE	6	47	75	WYW130081
10	Mahalo CS Federal	3	NESW	6	47	75	WYW130081
11	Mahalo CS Federal	4	SWSE	6	47	75	WYW130081
12	Mahalo CS Federal	5	NESE	7	47	75	WYW130081

No	Well Name	Well #	Qtr/Qtr	Section	Township	Range	Lease
13	Mahalo CS Federal	6	SWSE	7	47	75	WYW130081
14	Niche CS Federal Com	1	NESE	2	47	75	WYW146277
15	Niche CS Federal Com	2	NESW	2	47	75	WYW146277
16	Niche CS Federal	3	SWNW	6	47	75	WYW146277
17	Niche CS Federal	4	NENE	8	47	75	WYW146277
18	Niche CS Federal Com	5	NENW	8	47	75	WYW146277
19	Niche CS Federal	6	SWNE	8	47	75	WYW146277
20	Niche CS Federal Com	7	SWSW	8	47	75	WYW146277
21	Niche CS Federal Com	8	SWSE	8	47	75	WYW146277
22	Niche CS Federal Com	10	NESE	31	48	75	WYW146277
23	Niche CS Federal	11	NESW	31	48	75	WYW146277
24	Niche CS Federal	12	SWSE	31	48	75	WYW146277
25	Waikiki CS Federal	1	NENE	17	47	75	WYW145582
26	Waikiki CS Federal	2	SWNE	17	47	75	WYW145582
27	Waikiki CS Federal	3	NESE	17	47	75	WYW145582
28	Waikiki CS Federal	4	SWSE	17	47	75	WYW145582
29	Waikiki CS Federal	5	NENE	21	47	75	WYW145582
30	Waikiki CS Federal	6	NENW	21	47	75	WYW145582
31	Waikiki CS Federal	7	SWNW	21	47	75	WYW145582
32	Waikiki CS Federal	8	SWNE	21	47	75	WYW145582
33	Waikiki CS Federal	9	NESE	21	47	75	WYW145582
34	Waikiki CS Federal	10	NESW	21	47	75	WYW145582
35	Waikiki CS Federal	11	SWSW	21	47	75	WYW145582
36	Waikiki CS Federal	12	SWSE	21	47	75	WYW145582
37	Mandarin CS Federal	1	NENE	22	47	75	WYW128095
38	Mandarin CS Federal	2	NENW	24	47	75	WYW128095
39	Mandarin CS Federal	3	SWNW	24	47	75	WYW128095
40	Mandarin CS Federal	4	NESW	24	47	75	WYW128095
41	Mandarin CS Federal	5	SWSW	24	47	75	WYW128095
42	Mandarin CS Federal	6	NENW	25	47	75	WYW128095
43	Pineapple CS Federal	1	NENE	23	47	75	WYW132249
44	Pineapple CS Federal	2	SWNW	23	47	75	WYW132249
45	Pineapple CS Federal	3	SWNE	23	47	75	WYW132249
46	Pineapple CS Federal	4	NESW	23	47	75	WYW132249
47	Pineapple CS Federal	5	SWSE	23	47	75	WYW132249
48	Lani CS Federal	2	SWSW	30	48	75	WYW149796
49	Mahalo Injector Federal	7	NWSE	7	47	75	WYW130081
50	Waikiki Injector Federal	13	SWNW	21	47	75	WYW145582
51	Pineapple Injector Federal	6	NWSW	23	47	75	WYW132249

Water Management:

The approved water management plan (WMP) includes 12 reservoirs proposed for use with this POD. Yates bonded 2 reservoirs. BLM approves those 2 for the use of federal water with this POD.

No	Reservoir Name	Qtr/Qtr	Sec	TWP	RNG	Capacity (ac-ft)	Surface Disturbance (ac)	Lease
1	Firecracker	NENW	21	47	75	19.9	3.5	WYW145582
2	Nobama	SESW	23	47	75	19.7	4.9	WYW132249

Rights-of-Way:
Yates requested 2 rights-of-way (ROW) grants for Napier Road POD. BLM will approve ROW WYW-170229 under the Mineral Leasing Act for conveyance of gas; and BLM will approve ROW WYW-170228 under the Federal Land Policy and Management Act for road, water, and electric corridors – once the respective ROW offers are accepted by Yates. These ROWs are within the constraints of the POD's stipulations and conditions of approval (COAs). ROW details follow.

ROW Grant	ROW Action	Township	Range	Section	Length (ft)	Width (ft)
WYW-170229	Gas	47N/48N	75W	2,7,8, 21,23,30	19,100'	NTE 45'
WYW-170228	Road, Water, Power	47N	75W	2,7,21,23	12,650'	NTE 45'

NTE: not to exceed

Limitations: The following 10 approved reservoirs will not be used for federal water until after Yates applies for a sundry and provides proof of bonding to the BLM. There are 2 CBNG APD denials.

Water Management:

No	Reservoir Name	Qtr/Qtr	Sec	TWP	RNG	Capacity (ac-ft)	Surface Disturbance (ac)	Lease
1	Hide	NWSE	24	47	75	96.4	10.1	WYW145187
2	Jebediah	NWNE	21	47	75	15.1	2.4	WYW145582
3	Poncho	NESW	7	47	75	10.9	1.6	WYW145186
4	Powerline	SWSE	14	47	75	69.2	7.7	WYW145190
5	Soldier	NESE	11	47	75	19.9	3.9	WYW132922
6	Spring Fling	SWNE	11	47	75	49.9	6.2	WYW132922
7	Turtle	SWSE	23	47	75	82	9	WYW132249
8	Twister	NWNE	8	47	75	11.5	2	WYW146277
9	Vicki's Pond	SESE	10	47	75	98.3	9.8	WYW041522
10	War Paint	SWNW	11	47	75	11.1	1.7	WYW150756

Denials:
I deny the following 2 APDs and associated infrastructure:

#	Well Name	Well #	Environmental Issue/Justification
1	Lani CS Federal	1	Impacts to soils rated as limited reclamation absent mitigating design features and / or mitigation.
2	Niche CS Federal Com.	9	Impacts to ferruginous hawk nesting absent mitigating design features and / or mitigation.

Operator Committed Measures:

The operator incorporated several measures to alleviate resource impacts into their Master Surface Use Plan (MSUP), submitted on August 28, 2008 Refer to the MSUP pp. 1-2 for complete details of operator committed measures.

Site-specific Mitigation Measures:
Yates and BLM applied site-specific conditions of approval (COAs) 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 EA's Section 4, Environmental Effects. For a complete description of all site-specific COA's associated with this approval, see Section 4 mitigation sections under soils, vegetation and wildlife in the EA.

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 Bald and Golden Eagle Protection Act, the Clean Water Act, the Clean Air Act, and the National Environmental Policy Act.

Approval of Alternative C conforms to 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), (1985/2001/2003), and DOI Order 3310.

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 in the PRB FEIS ROD, 2003.

RATIONALE:
The decision to authorize Alternative C, as summarized above, is based on the following:

1. The denial of Lani CS Federal 1APD and its infrastructure is outside the parameters found in the PRB RMP FEIS ROD to prevent unnecessary and undue degradation (p. 11-12, A-19 to A-20, A-24, A-31) and the Wyoming BLM Reclamation Policy (see Appendix C of the EA) to avoid highly erodible areas when possible and when these cannot be avoided they must be mitigated. Here the Operator did not avoid an area with little-to-no reclamation potential and offered no mitigation (see EA, pp. 33-40, and the correspondence section of the administrative record). BLM recommended an alternative site within 200 meters that comported to 43 CFR 3101.1-2 and the Operator rejected that site EA, p. 38. BFO would consider a new APD in the BLM's recommended location.

2. The denial of Niche CS Federal Com 9 APD and its infrastructure is because the proposed location received a strong recommendation by the U.S. Fish and Wildlife Service (USFWS) to move the well 1.0 mile so it would be outside the ferruginous hawk's biological (spatial) buffer of active nest #8354 (see the EA's Appendix A., USFWS Letter, p.3). The Operator's 100 foot move of the well failed to mitigate the hawks' biological (spatial) buffer issues (see EA, pp. 48) and did not support the BLM's Sensitive Species policy and governing directives. BLM recommended an alternative site within 200 meters of the originally proposed location that offered biological (spatial) buffer from the nest and comported to 43 CFR 3101.1-2. The Operator rejected that site; see EA, p. 48-52 (and see the correspondence section of the administrative record). BFO would consider a new APD in the BLM's

recommended location. USFWS recommendations for raptor protection are being considered in the Buffalo RMP revision process.

3. Yates may use the secondary reservoirs for federally produced water after the BLM approves a sundry and receives proof of bonding for each reservoir. The use of the sundry notice is a subsequent operation (43 CFR 3162.3-2) and validates to the BLM that parameters used to analyze the proposed reservoirs in the EA remain current.

4. Yates and BLM included mitigation measures to reduce environmental impacts while meeting the project's need. The environmental effects section of the EA addresses mitigation. For a complete description of all site-specific conditions of approval (COAs) associated with this approval, see Appendix D, Mitigation Measures and Conditions of Approval in the EA.

   A. The decision to depart from the BLM's usual practice of upgrading private surface roads subject to oil and gas well servicing traffic (here in the eastern side of this POD) is not a precedent; rather it is a narrow exception for the narrow circumstances, reasons, and limited infrastructure-service area analyzed in the EA, pp.34-35, which is incorporated here by reference.

   B. The decision to allow and permit 1 low water crossing as "primitive" or as a "ford" near the Mandarin CS Federal 1 well, on federal lease WYW 126095, departs from the BLM's usual practice and Buffalo RMP ROD's policies, para. A.2.3., A.5.4.7., and A.5.4.8. is not precedent; rather it is a narrow exception based only on the narrow circumstances, analysis, and reasoning found in this EA, p. 35, which is incorporated here by reference.

5. The selected alternative will not result in any undue or unnecessary environmental degradation.

6. The selected alternative will help meet the nation's energy need, revenues, and stimulate local economies by maintaining workforce stability.

7. The Operator, in their POD, shall:
   - Comply with all applicable federal, state, and local laws and regulations (43 CFR 3162.1).
   - 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 (PRB FEIS ROD, p. 7; MSUP, Tab 4 p. 10).

8. The Operator committed to comply with the following requirements through COAs applied by the BLM since they are not stated in the MSUP and are part of normal operations.
   - Provide water analysis from a designated reference well in each coal zone.
   - 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.

9. Yates certified there is a surface use agreement with the landowners (MSUP, p. 13) or posted bond, however there is no agreement or bond for access to federal surface and minerals with the private landowner in Section 30, Township 45 North, Range 75 West.

ADMINISTRATIVE REVIEW AND APPEAL: 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: 7/6/11

FINDING OF NO SIGNIFICANT IMPACT
FOR Yates Petroleum Corporation, Napier Road POD
ENVIRONMENTAL ASSESSMENT (EA) –WY-070-EA10-280
Bureau of Land Management, Buffalo Field Office

FINDING OF NO SIGNIFICANT IMPACT:

On the basis of the information in the EA, and all other information available to me, it is my determination that: (1) the implementation of Alternative C will not have significant environmental impacts beyond those already addressed in the Power River Basin Final Environmental Impact Statement (PRB FEIS) to which the EA is tiered; (2) Alternative C conforms to the Buffalo Field Office (BFO) Resource Management Plan (RMP) (1985, 2001, 2003) and DOI Order 3310. However, due to declining populations of ferruginous hawks, best available science for the hawks and for areas with limited reclamation potential, and the mineral leasing rules in 43 CFR 3101.1-2, BLM affords protection to nesting hawk pairs on active nests and areas with limited reclamation potential; and (3) Alternative C does not constitute a major federal action having a significant effect on the human environment. Therefore an EIS is not required. 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 (leasable, locatable, and saleable) is a long-standing and common land use in the PRB. More than 40% of the nation's coal production comes from the PRB. The PRB FEIS reasonably foreseeable development predicted and analyzed the development of 51,000 coalbed natural gas (CBNG) and 3,200 oil wells (PRB FEIS Record of Decision (ROD), p. 2). The CBNG development described in Alternative C is insignificant in the national, regional, and local context.

INTENSITY:

The implementation of Alternative C will result in beneficial effects in energy and revenue production however; there will also be adverse effects to the environment (EA Sec. 4). Design features and mitigation measures were included in Alternative C to preclude significant adverse environmental effects.

The preferred alternative does not pose a significant risk to public health and safety. The geographic area of this plan of development (POD) does not contain unique characteristics identified in the RMP, 2003 PRB FEIS, or other legislative or regulatory processes or scientific documents, other highly erosive soils and soils with limited reclamation potential and a concentration of nesting raptors. This POD area is clearly lacking in wilderness characteristics due to existing infrastructure from CBNG development.

BFO used relevant scientific literature and professional expertise in preparing the EA. The scientific community is reasonably consistent with their conclusions on environmental effects relative to oil and gas development. Research findings on the nature of the environmental effects are not highly controversial, highly uncertain, or involve unique or unknown risks.

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.). No species listed under the Endangered Species Act or their designated critical habitat will be adversely affected (EA, Sec. 4.). The selected alternative will not have any anticipated effects that would threaten a violation of federal, state, or local law or requirements imposed for the protection of the environment.

ADMINISTRATIVE REVIEW AND APPEAL: This finding is subject to administrative review 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: 7/6/11

ENVIRONMENTAL ASSESSMENT (EA), WY-070-EA10-280
Yates Petroleum Corporation, Napier Road
Coalbed Natural Gas Plan of Development
BUREAU OF LAND MANAGEMENT, BUFFALO FIELD OFFICE

1. INTRODUCTION

This site-specific analysis tiers into and incorporates by reference the information and analysis in the Powder River Basin (PRB) Oil and Gas Project Final Environmental Impact Statement (FEIS) (2003) and Resource Management Plan (RMP) Amendment (PRB FEIS), #WY-070-02-065 (2003), pursuant to 40 CFR 1508.28 and 1502.21. This EA also tiers to the Buffalo RMP, 1985, and amendments, 2001, and 2003. These documents are available for review at the BLM Buffalo Field Office (BFO) and on our website. This project environmental assessment (EA) addresses site-specific resources and impacts that the PRB FEIS could not cover.

1.1. Background

Yates Petroleum Corporation (Yates or Operator) submitted the Napier Road plan of development (POD) on August 28, 2008 to the BFO with 53 applications for permit to drill (APDs) to develop and produce coalbed natural gas (CBNG) from coal formations of the PRB. Three of these APDs propose to re-enter existing well bores for injection of produced water in the Fort Union formation.

Yates and BFO conducted onsite visits in 2010 on July 19 through July 23, and July 28 to evaluate the proposal and modify it as necessary to alleviate environmental impacts. BLM sent a post-onsite deficiency letter on August 12, 2010. The project proposal and APDs were complete when Yates provided sufficient bonding on June 21, 2011 for its only 2 primary produced water impoundments, (see SDR Nos. WY-2011-017, Napier Road). The operator and BLM reached an agreement, via email, to move the proposed power drop in Section 7 T47N R75W. Yates agreed that they could locate the power drop in Section 18 T47N R75W along the main access to the Mahalo 5, 6, & 7 at the transition between Flying T Land and federal surface (at the section line). If Yates elects to drill the Mahalo #7 injector well then Yates will submit a sundry extending the overhead up to the previous proposed location of the power drop; (see administrative record, correspondence tab).

There is a direct relationship between Napier Road POD and surrounding PODs. The majority of the infrastructure serving the Napier Road POD wells, such as routes along roads, was earlier approved in Bill Barrett Corporation's Beaver Creek POD, Yates' Veranda POD, and Citation Oil and Gas' Triangle Unit POD, (see Table 3.1. for approval dates of surrounding PODs). The Beaver Creek POD roads are primitive roads – which supported the landowner's request to reduce road construction disturbance on his private surface. Some of those roads are deteriorating due to CBNG and conventional oil well traffic.

1.2. Need for the Proposed Action

The need for the action is the requirement to obtain approval for the development of an oil and gas lease through an APD on federal land managed by the Bureau of Land Management (BLM) under the Mineral Leasing Act (MLA), Onshore Order No. 1, the Federal Land Policy and Management Act (FLPMA), and complies with the National Environmental Policy Act (NEPA), National Historic Preservation Act, Endangered Species Act, and other applicable laws and regulations ensuring the proper handling, measurement, disposition, and site security of leasehold production which balances natural resource conservation while supporting conditional leasehold rights and the nation's goal of advancing energy development.

1.3. Decision to be Made

The BLM will decide whether or not to, or how to, or how it may approve the proposed development of oil and gas minerals on the federal leasehold, and if so, under what terms and conditions.

1.4. Scoping and Issues

BFO did not conduct external scoping for this EA. BFO conducted extensive external scoping for the PRB FEIS as noted on p. 2-1 of the PRB FEIS and on p. 15 of the PRB ROD. This project is generally similar in scope to other CBNG PODs that the BFO analyzed.

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 project. 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 important issues for the affected resources to further focus the analysis. This EA addresses the site-specific impacts beyond those analyzed in the PRB FEIS and identifies potentially significant effects of the proposed project to help the decision maker come to a reasoned decision. Project issues include:

1. Soils and Vegetation: erosion hazard, slope hazard, reclamation potential, riparian and wetland communities, and weed species;
2. Wildlife: raptor productivity, greater sage-grouse lek occupancy and persistency, swift fox productivity;
3. Cultural Resources: potential for buried cultural material;
4. Water: groundwater depletion, quality and quantity of produced water, and;
5. Economic resources.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

BFO evaluated 3 alternatives in this EA and their brief description follows, below. Programmatic mitigation measures, as determined in PRB FEIS ROD apply to all alternatives, including the no action alternative (Alternative A), and are included in Appendix D, Standard Mitigation Measures. Operator-committed mitigation measures and site-specific conditions of approval (COAs) would apply only to action alternatives (a combination of Alternatives B and C) and also are included in Appendix D.

2.1. Alternative A - No Action

The PRB FEIS considered a no action alternative, Volume 1, pp. 2-54 to 2-62. This alternative must also consider and combine the PRB FEIS analysis with the subsequent analysis and development from the adjacent and intermingled PODs: Beaver Creek, WY-070-EA05-058; Beaver Creek Add II, Add II SGP, and Little Buffalo 32-24 & 34-24 WY-070-EA09-065; Schoonover Road 5, WYW-070-06-295; Veranda, WY-070-EA09-039; Double Tank Phase 2, WY-EA09-040; and Triangle Unit North, WY-070-06-282. (See Table 2.5 for an approximation of the disturbance in the current situation.) This comports to the PRB FEIS which analyzed the reasonably foreseeable development rolling across the PRB of over 51,000 CBNG and 3,200 oil wells. The no action alternative would consist of no new federal wells. This alternative would deny the APDs and /or POD requiring the operator to resubmit APDs or a POD that complies with statutes and the reasonable measures in the PRB RMP Record of Decision (ROD) in order to lawfully exercise conditional lease rights. This alternative also could, through secretarial discretion suspend the leasehold, or could administratively cancel or withdraw the lease if improperly awarded, or seek to cancel the lease. It is not possible in the abstract to identify every interest and that is beyond the scope here.

2.2. Alternative B - Operator Proposed Action

Alternative B contains complete APDs and is a result of the operator and BLM working to reduce

environmental impacts. This alternative summarizes the POD submitted to the BLM by Yates on September 24, 2010 – after site visits and the Operator's design modifications.

Proposed Action Title/Type: Yates Petroleum Corporation's Napier Road POD

Proposed Well Information: Yates proposed 50 CBNG and 3 water injection wells in this POD. The proposed wells are vertical bores on an 80 acre spacing pattern with 1 well per location. Each well will produce from Big George coal seam. Proposed well house dimensions are 8.0 feet wide x 8.0 feet length x 8.0 feet height. Table 2.1 has a list of proposed wells.

County: Campbell

Applicant: Yates Petroleum Corporation

Surface Owners: Trigg Marquiss, Little Buffalo Ranch, Flying T Land Company, Nisselius Ranch Company, Richard and Dorothy Davis Trust, and Bureau of Land Management.

Table 2.1. Proposed Wells – Alternative B

No	Well Name	Well	Qtr/Qtr	Section	TWN	RNG	Lease
1	Schofield CS Federal	1	SWNE	11	47	75	WYW132922
2	Schofield CS Federal	2	NESE	11	47	75	WYW132922
3	Cubicle CS Federal Com.	1	NESW	7	47	75	WYW145186
4	Napier Road CS Federal	1	SWSE	11	47	75	WYW108587
5	Napier Road CS Federal	2	NENE	11	47	75	WYW108587
6	Hamlet CS Federal Com.	1	SWNW	11	47	75	WYW150756
7	Hamlet CS Federal Com.	2	NENW	14	47	75	WYW150756
8	Mahalo CS Federal Com.	1	SWNE	6	47	75	WYW130081
9	Mahalo CS Federal	2	NESE	6	47	75	WYW130081
10	Mahalo CS Federal	3	NESW	6	47	75	WYW130081
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12	Mahalo CS Federal	5	NESE	7	47	75	WYW130081
13	Mahalo CS Federal	6	SWSE	7	47	75	WYW130081
14	Niche CS Federal Com.	1	NESE	2	47	75	WYW146277
15	Niche CS Federal Com.	2	NESW	2	47	75	WYW146277
16	Niche CS Federal	3	SWNW	6	47	75	WYW146277
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24	Niche CS Federal	11	NESW	31	48	75	WYW146277
25	Niche CS Federal	12	SWSE	31	48	75	WYW146277
26	Waikiki CS Federal	1	NENE	17	47	75	WYW145582

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28	Waikiki CS Federal	3	NESE	17	47	75	WYW145582
29	Waikiki CS Federal	4	SWSE	17	47	75	WYW145582
30	Waikiki CS Federal	5	NENE	21	47	75	WYW145582
31	Waikiki CS Federal	6	NENW	21	47	75	WYW145582
32	Waikiki CS Federal	7	SWNW	21	47	75	WYW145582
33	Waikiki CS Federal	8	SWNE	21	47	75	WYW145582
34	Waikiki CS Federal	9	NESE	21	47	75	WYW145582
35	Waikiki CS Federal	10	NESW	21	47	75	WYW145582
36	Waikiki CS Federal	11	SWSW	21	47	75	WYW145582
37	Waikiki CS Federal	12	SWSE	21	47	75	WYW145582
38	Mandarin CS Federal	1	NENE	22	47	75	WYW128095
39	Mandarin CS Federal	2	NENW	24	47	75	WYW128095
40	Mandarin CS Federal	3	SWNW	24	47	75	WYW128095
41	Mandarin CS Federal	4	NESW	24	47	75	WYW128095
42	Mandarin CS Federal	5	SWSW	24	47	75	WYW128095
43	Mandarin CS Federal	6	NENW	25	47	75	WYW128095
44	Pineapple CS Federal	1	NENE	23	47	75	WYW132249
45	Pineapple CS Federal	2	SWNW	23	47	75	WYW132249
46	Pineapple CS Federal	3	SWNE	23	47	75	WYW132249
47	Pineapple CS Federal	4	NESW	23	47	75	WYW132249
48	Pineapple CS Federal	5	SWSE	23	47	75	WYW132249
49	Lani CS Federal	1	SWNW	30	48	75	WYW149796
50	Lani CS Federal	2	SWSW	30	48	75	WYW149796
51	Mahalo Injector Federal	7	NWSE	7	47	75	WYW130081
52	Waikiki Injector Federal	13	SWNW	21	47	75	WYW145582
53	Pineapple Injector Federal	6	NWSW	23	47	75	WYW132249

Water Management Proposal: Yates bonded and BFO approved the use of federal waters in facilities identified and scheduled for primary water management. Facilities identified as secondary received an environmental review, however, the operator chose to not provide reclamation bonds, and will not use them for federally produced water until BLM receives a sundry and proof of bonding. Table 2.2A and Table 2.2B include the water management infrastructures proposed for use.

Table 2.2A. Primary Proposed Water Management Reservoirs – Alternative B

No	Reservoir Name	Qtr/Qtr	Sec	TWP	RNG	Capacity (ac-ft)	Surface Disturbance (ac)	Lease
1	Firecracker	NENW	21	47	75	19.9	3.5	WYW145582
2	Nobama	SESW	23	47	75	19.7	4.9	WYW132249

Table 2.2B. Secondary Proposed Water Management Reservoirs – Alternative B

No	Reservoir Name	Qtr/Qtr	Sec	TWP	RNG	Capacity (ac-ft)	Surface Disturbance (ac)	Lease
1	Hide	NWSE	24	47	75	96.4	10.1	WYW145187
2	Jebediah	NWNE	21	47	75	15.1	2.4	WYW145582
3	Poncho	NESW	7	47	75	10.9	1.6	WYW145186
4	Powerline	SWSE	14	47	75	69.2	7.7	WYW145190
5	Soldier	NESE	11	47	75	19.9	3.9	WYW132922
6	Spring Fling	SWNE	11	47	75	49.9	6.2	WYW132922
7	Turtle	SWSE	23	47	75	82	9	WYW132249
8	Twister	NWNE	8	47	75	11.5	2	WYW146277
9	Vicki's Pond	SESE	10	47	75	98.3	9.8	WYW041522
10	War Paint	SWNW	11	47	75	11.1	1.7	WYW150756

Drilling and Construction:

- Drilling of 50 federal CBNG wells in Big George coal zone is to depths of approximately 1600 feet. Three locations will use slots of 30 feet x 120 feet; 47 well locations will not use a constructed or slotted pad.

- Drilling of 3 water injector wells in Fort Union formation is to depths of ranging from 3,800 feet to 4,500 feet. These wells have existing pads with cut/fill slopes less than 2 feet (See Tab 3 MSUP) for minor leveling. The water injection wells use existing plugged and abandoned (P&A) well locations and reuse the well bores of these P&A locations.

- A water management plan (WMP) that involves the following water management strategies. Yates proposes accomplishing produced water management from the 50 CBNG wells through a combination of:
  - Reinjection to the Fort Union formation using 3 deep injection disposal wells;
  - Containment within 12 on-channel reservoirs; 2 primary and 10 secondary.

- Yates anticipates completing drilling and construction within 2 years, the term of an approved 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 a combination of telemetry and well visitation. Metering would entail 2-3 visits per week during the summer and up to 4 visits per week during the winter to each well location.

- A road network consisting of 11.9 miles of improved road and 16.84 miles of primitive road.

- Both above ground and below ground power line network to be constructed. Above ground work will be performed by Powder River Energy Corporation; below ground work will be performed by Yates Petroleum or a contractor hired by Yates. If the power line network is not completed before the wells are in production, then temporary diesel generators may be placed at the 13 power drops.

- Yates may locate fuel storage tanks of 500 gallon capacity at 13 power drops along with each diesel

generator. Generators may operate for 24 months. The analysis anticipates that fuel deliveries may be 2-3 times per week during the summer and 4 times per week during the winter. Fuel delivery duration should be from 30 to 60 minutes. The generator noise level is about 100.5 decibels at 3-feet distance.

- Yates will install a buried gas and water line network along existing or proposed disturbances.

Yates requested 2 rights-of-way (ROW) grants for Napier Road POD. Authorization of ROW WYW-170229 is under the MLA and is for conveyance of gas. Authorization of ROW WYW-170228 is under the FLPMA and is for road, water, and electric infrastructure. These ROWs will fall within the constraints of the appropriate design and COAs of the POD. Table 2.3 has the ROWs proposed with this POD.

Table 2.3. Rights-of-Way Grants

ROW Grant	ROW Action	Township	Range	Section	Length (ft)	Width (ft)
WYW-170229	Gas	47N/48N	75W	2, 7, 8, 21, 23, 30	19, 100’	NTE 45’
WYW-170228	Road, Water, Electricity	47N	75W	2, 7, 21, 23	12,650’	NTE 45’

NTE: not to exceed

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 POD for maps showing the proposed well locations and the associated facilities described above. More information on CBNG well drilling, production and standard practices also is available in the PRB FEIS, Volume 1, pp. 2-9 to 2-40 (2003).

This alternative also incorporates and analyzes the implementation of committed mitigation measures contained in the MSUP, drilling plan, and WMP, in addition to the Standard COAs found in the PRB FEIS ROD, Appendix A.

2.3. Alternative C – Modified Action

Alternative C is a modification of Alternative B based on BLM removing 2 wells from the project proposal which will have large, direct impacts to an area which has little or no reclamation suitability and would impact the local ferruginous hawk population through a high likelihood of nest abandonment.

This alternative specifically represents BFO efforts to reduce project-specific impacts to highly erosive soils and ferruginous hawk habitat while trying to maintain proposed spacing and infrastructure requirements consistent with the need for the proposed action. BLM recommended the 2 APD’s and associated infrastructure removal from the project; therefore they are not considered in this Alternative C. (See Table 2.4).

Table 2.4. Project Components Recommended for Removal

#	Well Name	Well #	Environmental Issue/Justification
1	Lani CS Federal	1	Impacts to soils rated as limited reclamation absent mitigating design features and / or mitigation. (See pp. 32-38)
2	Niche CS Federal Com.	9	Impacts to ferruginous hawk nesting with insufficient mitigating design features and / or mitigation. (See p. 45-49)

2.4. Design Features

BLM received the original Napier Road POD on August 28, 2008 with 53 federal APDs. This EA analyzes a subsequent proposal upon which Yates and the BFO collaborated to minimize environmental

impacts; therefore BFO does not analyze the original POD submittal. Yates' and BFO's discussions and onsite visits between July 2010 and December 2010, based on the initial project description, led to adjustments to the initial proposal. See the following summary.

- 47 well locations will not require earth work preparation (no engineered pad/no slot) other than digging of drilling pits and digging in wheels to level the drilling rig. Construction of wells with no pad and no slot would result in less soil disturbance to the soil resource. No soil would be removed or graded. Where reserve pits are built for these wells, Yates will maintain soil productivity and soil quality when segregating top soil and saving for distribution on pit disturbances.
- Three well locations (Lani 1, Napier 2, and Mahalo 4,) were originally constructed locations but were reduced to a slot design.
- Three injector well locations will use plugged and abandoned well locations with reentry into the existing plugged well bore.
- The majority of single well locations will use primitive access roads. The use of primitive roads would result in less soil disturbance to the soil resource.

Yates rejected the application of BLM Road Standards (BLM 9113) on private surface to the following proposed roads:

- The addition of a cut slope rounding template design at the beginning of the access to Niche 5, and 6, due to the deteriorated existing state of the current primitive road.
- The addition of a typical low water crossing (LWC) (as shown in Tab 5 Attachment D of Napier Road MSUP) or typical culvert for the drainage crossing to Mandarin 1.
- The addition of a crowned or crowned and ditched template design applied to upgrade the entire length of the resource road to Hamlet l, Napier 2, Schofield 2, and Napier 1. BFO requested this due to the potential for high average daily traffic and the deteriorated existing state of the current primitive road.

The above changes as documented in a revised project description provided as Yates' response to BLM's deficiency letter, resulted in a refined proposed project, which is discussed in this document as Alternative B. The initial POD, the post-onsite deficiency letter, and the company's response to the deficiency letter are included in the project administrative record.

2.5. Summary of Alternatives

A summary of the: existing disturbance in the project area (Alternative A), modified infrastructure proposed by the Operator (Alternative B), and the infrastructure recommended by BLM (Alternative C) is in Table 2.5.

Table 2.5. Comparison of Approximate Disturbance by Alternative

Acres or mileage from the action alternatives represent additional facilities and do not include the existing facilities.

Facility	Alternative A Miles/Acres	Alternative B Miles/Acres	Alternative C Miles/Acres
Total Oil Wells	4(2.1 ac)	0	0
Total Water Injection Wells	0	3	3
CBNG Well Locations	68(12.6 ac)	50	48
Non-constructed		47(4.7 ac)	46(4.6 ac)
Engineered		0	0
Slotted		3(0.3 ac)	2(0.3 ac)

Facility	Alternative A Miles/Acres	Alternative B Miles/Acres	Alternative C Miles/Acres
Miles of Template Road	8.2(19.8 ac)	11.9(64.8 ac)	11.6(64.5 ac)
No Corridor		0	0
With Corridor		11.9(64.8 ac)	11.6(64.5 ac)
Miles of Engineered Road	2.4(8.8 ac)	0.1	0.0
No Corridor		0.0	0.0
With Corridor		0.1	0.1
Miles of Primitive Road	18.1(26.2 ac)	16.8(91.9 ac)	16.8(91.9 ac)
Miles of Buried Utilities	2.1(3.8ac)	26.6(145.2 ac)	26.1(145.2 ac)
No Corridor		2.8(15.2 ac)	2.8(15.2 ac)
With Corridor		23.8(130.0 ac)	23.8(130.0 ac)
Miles of Overhead Power Lines	2.0(7.1ac)	5.0(9.3 ac)	5.0(9.3 ac)
	Assuming 30ft disturbance width.	Assuming 30ft disturbance width.	Assuming 30ft disturbance width.
Number of On-channel Impoundments	13	12(62.8 ac)	12(62.8)
Water Discharge Points		12(1.2 ac)	12(1.2ac)
TOTAL ACRES DISTURBANCE	**147.0**	**381.5**	**381.1**

2.6. Alternatives Considered but Not Analyzed in Detail

BFO did not analyze land application as a water management plan because this area's dissected terrain yields few areas suitable for land application. The clayey soils in the area are less suitable for land application as soils with higher sand content. Land application would still require the construction of several reservoirs. See Napier Road POD WMP, p.3.

BFO considered ion exchange treatment technologies for handling produced water. BFO did not further analyze this water management strategy because of the waste stream it generates and its subsequent need for suitable waste disposal. See the Napier Road POD WMP, p. 4.

The U.S. Fish and Wildlife Service (USFWS) provided recommendations. The cumulative suggestions could rise to an alternative, but after a preliminary investigation of the well spacing resulting from the suggested well moves BLM noted the suggestions put wells outside Yates' lease, and thus the totality of the suggestions fell far outside that of a viable alternative for the cumulative suggestions failed to support the project's need. The USFWS recommendations in total did not receive detailed analysis as a viable alternative - they were not analyzed in terms of other resource issues like, soils, vegetation, ground water, surface water, cultural resources, etc. Yet several of the USFWS recommendations are useful and were integral to the analysis of ferruginous hawks in Section 4 of this EA. See USFWS letter in Appendix A.

2.7. Conformance with Land Use Plan and Other Applicable Laws, Regulations, and Policies

The proposed project generally conforms to the terms and the conditions of the 1985 BFO RMP (BLM

1985), the amendments, (BLM 2001), (BLM 2003), and the PRB FEIS (including the PRB Record of Decision (ROD) (BLM 2003a, b). The proposal complies with all federal laws, regulations, and policies. This includes, but is not limited to, the following Acts and Orders, as amended: FLPMA, MLA, National Historic Preservation Act (1966), Endangered Species Act (ESA) (1973), Clean Water Act (1972), Clean Air Act (1970), National Environmental Policy Act (NEPA) (1969), and USDOI Order 3310.

3. AFFECTED ENVIRONMENT

Section 3 describes and analyzes the physical and regulatory environment existing and trends of issue-related items for the project area described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. Find a screening of all resources and land uses potentially affected in Appendix B. This EA does not discuss or analyze resources that would be unaffected, or not affected beyond the level analyzed in the PRB FEIS.

3.1. Project Area Description

The Napier Road POD is approximately 28 miles southwest of Gillette, Campbell County, Wyoming and includes all or portions of:

Township 47 North, Range 75 West, Sections 2, 6, 7, 8, 11, 14, 17, 21, 22, 23, 24, 25
Township 48 North, Range 75 West, Sections 30, 31

The project area encompasses 11.0 square miles (7,028.3acres). Elevations in the project area range from approximately 4,400 feet to 4,924 feet above sea level. Topography throughout the project area ranges from rolling hills interspersed with long ridges and low, rocky knolls to steep and broken terrain featuring several deep, eroded draws with exposed pares soil and sandstone. The relatively level areas are primarily isolated to the Beaver Creek drainage area which traverses the POD site from southeast to northwest.

The area is in a 10-14 inch precipitation zone, with most of the precipitation falling during late winter and spring. Existing land practices in the area include livestock grazing, CBNG development, and conventional oil production.

The Napier Road project is adjacent to the boundaries of 8 approved CBNG PODs that include 617 wells, 68 of which are within the Napier Road POD boundary, see Table 3.1. The Napier Road POD area is clearly lacking wilderness characteristics because of CBNG infrastructure development.

Table 3.1. CBNG POD Development Adjacent or Overlapping with the Napier Road POD

POD Name	Environmental Assessment #	Decision Date
Beaver Creek	WY-070-05-058	1/13/2005
Beaver Creek Add II, Add II SGP, and Little Buffalo 32-24 & 34-24	WY-070-09-065	5/28/2009
Schoonover Road 5	WY-070-06-295	9/22/2006
Veranda	WY-070-09-039	7/27/2009
Double Tank Phase 2	WY-070-09-040	7/28/2009
Triangle Unit North	WY-070-06-282	9/14/2006

BFO analyzed, in part, Napier Road's existing main access road and utility corridor under the Beaver

Creek POD and Beaver Creek Add II in 2005 and 2009, respectively. That road travels north-south through Section 11 and 14 of Township 47 North (T47N), Range 75 West (R75W).

The existing roads in the project area (excluding Campbell County's Napier Road), are primitive ranch roads, primitive oil and gas roads, (both also known in the lexicon of BLM Travel and Transportation Management, Handbook 1626, as two-track routes) and improved oil and gas roads. The existing primitive roads on private surface are deteriorating from lack of drainage on erosional soils, increased traffic volumes, and minimal maintenance.

The primitive road in Section 18 of T47N R75W serves as access to several federal CBNG wells on other federal projects. This road also provides access to the Napier Road POD Cubical 1 well and Poncho reservoir. This road is routed through a playa. Traffic is routing through the playa during dry conditions and around the playa during wet conditions. BLM identified this problem at the onsite but decided not to reroute the road permanently since a reroute would require additional surface disturbance into sage brush within the 0.25 buffer of the sage-grouse lek. Current operators agreed to use the road in Section 18 of T47N R75W through the playa only during dry conditions and driving around it will not be encouraged by company foremen.

3.2. Soils, and Ecological Sites

3.2.1. Soils

Soils developed in alluvium and residuum derived mainly from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams resulting in a wide variety of surface and subsurface textures. Soil depths vary from deep on lesser slopes to shallow and very shallow on steeper slopes. Differences in lithology produced topographic and geomorphic variations in the area. Ridges and hills are often protected by an erosion resistant cap of clinker, terrace gravels or sandstone. Parent material chemistry may result in local concentration of salts.

Soils differ with topographic location, slope and elevation. Topsoil depths to be salvaged for reclamation range from 0 to 4 inches on ridges to 8+ inches in bottomland. Erosion potential varies depending on the soil type, vegetative cover and slope. Reclamation potential of soils also varies 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.

Detailed soils identification and data for the project area were obtained from the South Campbell County Survey Area, Wyoming Soil Survey Geographic (SSURGO) Database (WY605). The soil survey was performed by the Natural Resource Conservation Service (NRCS) according to National Cooperative Soil Survey standards. The BLM uses county soil survey information to predict soil behavior, limitations, or suitability for a given activity or action. The agency's long term goal for soil resource management is to maintain, improve, or restore soil health and productivity, and to prevent or minimize soil erosion and compaction. Soil management objectives are to ensure that adequate soil protection is consistent with the resource capabilities. Many of the soils and landforms of this area present distinct challenges for development, and /or eventual site reclamation.

A tabulated summary of the dominant and important soil map units follows, along with their individual acreage and percentage of the area within the POD boundary.

Table 3.2. Dominate and Important Soils

Map Unit	Map Unit Name	Acres	Percent
217	THEEDLE-SHINGLE LOAMS, 3 TO 30 PERCENT SLOPES	1236.4	18%
122	CUSHMAN-CAMBRIA LOAMS, 6 TO 15 PERCENT SLOPES	626.5	9%
147	FORKWOOD-CUSHMAN LOAMS, 6 TO 15 PERCENT SLOPES	558	8%

Map Unit	Map Unit Name	Acres	Percent
215	THEEDLE-KISHONA LOAMS, 6 TO 20 PERCENT SLOPES	531.1	8%
233	USTIC TORRIORTHENTS, GULLIED	461.2	7%
121	CUSHMAN-CAMBRIA LOAMS, 0 TO 6 PERCENT SLOPES	430	6%
126	CUSHMAN-THEEDLE LOAMS, 0 TO 6 PERCENT SLOPES	318.2	5%
216	THEEDLE-KISHONA-SHINGLE LOAMS, 3 TO 30 PERCENT SLOPES	274.6	4%
213	TERRO-TALUCE SANDY LOAMS, 6 TO 30 PERCENT SLOPES	66.4	1%

Source: NRCS 2010.

See the NRCS Soil Survey WY605 – South Campbell County (SSURGO) data for more detailed soil information. Ecological Site interpretations include additional site-specific soil information.

Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to a taxonomic class other than those of the major soils. Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called non-contrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components were perhaps unobserved, and consequently are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

3.2.1.1. 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. When 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.)

Soil scientists determined the project area soils are susceptible to erosion in varying degrees. Table 3.3 shows the relative erosion potential.

Table 3.3. Relative Erosion Potential

Erosion Potential (wind & water)	Acres	% of Project Area
Slight	3033	43
Moderate	3679	51
Severe	488	6

3.2.1.2. Limited Reclamation Potential (LRP)

Scientists identify LRP soils using SSURGO Data and onsite investigation. The onsite investigation found LRP areas in the project boundary have minor component described as miscellaneous areas or soils series in the above Taxa.

3.2.1.2.1. Miscellaneous Areas, and Subgroups Above Level of Soil Taxonomy

Miscellaneous areas have essentially no soil and support little or no vegetation. They can result from active erosion, washing by water, unfavorable soil conditions, or human activities. Some miscellaneous areas can be made productive, but only after major reclamation efforts. (430-VI-NSSH, 1996)

Badlands: A landscape which is intricately dissected and characterized by a very fine drainage network with high drainage densities and short, steep slopes with narrow interfluves. Badlands develop on surfaces with little or no vegetative cover, overlying unconsolidated or poorly cemented materials (clays, silts, or in some cases sandstones) sometimes with soluble minerals such gypsum or halite. (430-VI-NSSH, 1996)

Rock outcrop: Consists of exposures of bare bedrock. Most rock outcrops are hard rock, but some are soft. (430-VI-NSSH, 1996)

Subgroups and above level of soil taxonomy (USTIC TORRIORTHENTS, GULLIED): Indicating a wide range in soil properties, making soil interpretations and suitability's difficult to predict. A "gullied" phase is recognized if gullied land occupies less than about 10 percent of the map unit. Gullied phases are used for areas having gullies so deep that intensive measures, including reshaping, are reclaiming the soil. (Soil Survey Manual 1993)

BLM used SSURGO Data to determine that soils in the project area contain 7% LRP areas.

3.2.1.3. Reclamation Suitability

Currently soil conditions in the project area are 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 re-vegetate or otherwise reclaim. Soil impacts (e.g., roads, linear pipeline scars, and artificial wet areas) can be readily observed in the area.

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.

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. Many of the soils and landforms of this area present distinct challenges for development. Approximately 28 % of the area within the boundary of the proposed action contains soil mapping units having poor reclamation suitability. The remaining soils have slight or moderate reclamation suitability.

3.2.1.4. Vegetation and Ecological Sites

BLM staff identified the dominant vegetation community types in the project area are mixed-grass prairie

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

In addition, bluebunch wheatgrass (*Pseudoroegneria spicata*), green needlegrass (*Nassella viridula*) were identified in the project area. Additional forb and shrub species observed during the site visit included yucca (*Yucca glauca*), common yarrow (*Achillea millefolium*), penstemons (*penstemon* spp.), American vetch (*Vicia americana*), and milkvetch (*Astragalus* spp.). Non-native graminoids present included cheatgrass (*Bromus tectorum*), which is quite extensive in the project area. Cheatgrass is the dominant species present in some locations.

The site visits confirmed the presence of tree species in draws, along the creeks. Cottonwoods (*Populus* spp.) are present in many of the drainage bottoms.

Ecological site descriptions provide site and vegetation information needed for resource identification, management and reclamation recommendations. BLM specialists used NRCS published soil survey information, verified through onsite field reconnaissance, to determine the appropriate ecological sites for this POD area.

Dominant or important ecological sites and plant communities identified in the project area are Loamy (10-14NP), Clayey (10-14NP), subgroups and above level of soil taxonomy, and Sandy (10-14NP). Refer to ecological site narrative sections below for description of vegetation species observed during onsite field visits. Table 3.4 summarizes the project area's ecological sites.

Table 3.4. Summary of Ecological Sites

Ecological Site	Approximate Acres	Project Area (%)
Loamy 10-14" Northern Plains	5546.9	79%
Clayey 10-14" Northern Plains	506.7	7%
Subgroups and above level of soil taxonomy	461.2	7%
Sandy (10-14 NP)	135.9	2%

Source NRCS 2010

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 inches 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. Dominant vegetation includes 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.

Clayey sites occur on nearly level to steep slopes on landforms which include hill sides, alluvial fans and stream terraces in the 10-14 inch precipitation zone. The soils here are moderately deep to very deep (greater than 20 inches to bedrock), well-drained soils that formed in alluvium or alluvium over residuum derived calcareous shale. These soils have slow permeability. The bedrock is clay shale which is virtually

impenetrable to plant roots. The present plant community is the similar to the Loamy site listed above.

Subgroups and above level of soil taxonomy: No ecological site assigned due to site variability.

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 inches 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 the similar to the Loamy site listed above with the following exception: Wyoming big sagebrush not as dominant.

3.2.1.5. Wetlands/Riparian

The project areas are primarily upland. Upper ephemeral drainages flow into the larger ephemeral creeks namely: Dead Horse and Beaver Creek. The ephemeral swales and side drainages consist of upland vegetation while the Dead Horse and Beaver Creek drainages have limited riparian vegetation. There are some sparse cottonwoods along Beaver Creek. Currently CBNG produced water is permitted flow from CBNG operations into the tributaries contained in the project area. Based on National Wetland Inventory data available for the project area (USFWS 2009), 1.14%of the project area is herbaceous wetlands. For more information regarding wetland and riparian refer to the PRB FEIS, pp. 3-36 to 3-56.

3.2.1.6. Invasive Species

The Wyoming Energy Resource Information Clearinghouse (WERIC) maintains a database listing invasive species locations and other data. The University of Wyoming, BLM, and county Weed and Pest offices cooperatively created the WERIC database. BFO found the following state-listed noxious weeds and/or weed species of infestation concern for the project area in the WERIC database (www.weric.info):

- Diffuse knapweed
- Black henbane
- Buffalo bur

The Operator or BLM confirmed the following infestations and/or documented additional weed species during field investigations:

- Cheat grass

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

3.3. Wildlife

BFO and Yates consulted several resources to identify wildlife species that may occur in the proposed project area. Resources included the wildlife database compiled and managed by the BFO wildlife biologists, the PRB FEIS, the Wyoming Game and Fish Department (WGFD) big game and sage-grouse maps, and the Wyoming Natural Diversity Database (WYNDD).

ICF Jones & Stokes, now dba ICF International, (ICF) performed a habitat assessment and wildlife inventory surveys. ICF surveyed for mountain plover, sharp-tailed grouse, greater sage-grouse, bald eagles, raptor nests, and prairie dog colonies in 2008 and 2010, (ICF Jones & Stokes 2008, ICF 2010). Surveys for bald eagle winter roosts occurred in the winter of 2009/2010 (ICF 2010). A habitat assessment occurred in 2008 (ICF Jones & Stokes 2008). Ute ladies'-tresses orchid surveys occurred in 2009-2010(ICF 2010), as were surveys for blowout penstemon. There were no formal surveys done for any species not mentioned above; however ICF biologists documented any sightings of BLM sensitive species and reported those observations to BFO. ICF conducted all surveys, except those for raptors, according to the PRB Interagency Working Group's protocols, available on the BFO internet website at:

http://www.blm.gov/wy/st/en/field_offices/Buffalo/wildlife.html.

BLM wildlife biologists conducted field visits on July 19 to 22, and on October 1, 2010. The biologists reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided modification recommendations where wildlife issues arose.

WGFD is responsible for management of wildlife populations in the state of Wyoming. WGFD developed several guidance documents that BLM BFO wildlife staff relies upon in evaluating impacts to wildlife and wildlife habitats. WGFD documents used to analyze the proposed project under the current analysis are referenced in this section.

3.3.1. Habitat Types

Habitats occurring within the Napier Road project area are mostly sagebrush grassland and grassland types. Some riparian, woodlands, and rock outcrop areas also occur, though infrequently.

Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), the most abundant shrub in the area, is dominant throughout the project area. It occurs in a patchy mosaic of sparse to dense stands throughout the project area. Western extents of the area are covered with uniform sparse stands of sagebrush interspersed with moderately dense to dense patches in Sections 6, 8, 17, and 21. Eastern and southern extents of the area are characterized by larger expanses of moderately dense stands in the south half of Sections 23 and 24, with sparse stands within drainages. Silver sage is present within Beaver Creek and Kaufman Draw, and Great Plains yucca and rabbitbrush are common in some upland areas. Skunkbush sumac and currant are also found in the project area.

Large-scale development of energy reserves underlying sagebrush ecosystems is placing sagebrush communities and wildlife increasingly at risk (WGFD 2009a). Sagebrush ecosystems support a variety of species, including migratory birds, raptors, big game, reptiles, and small mammals. Several Wyoming BLM sensitive species are associated with sagebrush ecosystems. Sagebrush shrublands and grasslands are one of the most imperiled ecosystems in North America (Samson and Knopf 1996, USFWS 2010). Sagebrush recovery after disturbance depends on the availability of an adjacent seed source and may take decades to occur (USFWS 2010).

Large grassland expanses are mainly found in the southeast portions of the project area along gentle slopes and ridges in Sections 5, 8, 16, 24, and 25. Heights ranged from 10-18 inches tall with low densities of bare ground in most areas, but were lower with higher densities of bare ground in areas occupied by prairie dogs and along some ridgelines.

Trees and woodland habitats are generally sparse in the project area occurring mainly in Beaver Creek and some isolated draws. Smaller stands (4 to 10 trees) of trees (10 to 15 feet) are in Kaufman and Charlie Draws (NESE S24), and one unnamed draw (NENW S17). Other scattered isolated trees are found throughout the project area as well. In addition, juniper trees are present in drainages in the northwest extents of the project area.

Beaver Creek is the most significant drainage in the project area, flowing southeast to northwest. The majority of the project area flows into Beaver Creek via Kaufman Draw, Charlie Draw, Pinette Draw, and unnamed draws. It has a steady water flow with intermittent pooling. Existing CBNG reservoirs occur in NENW S2, NESW S11, SENE and SWNW S14, and SENW S26. Mesic vegetation species occur in portions of Kaufman and Charlie Draws where moist soil conditions exist.

3.3.2. Threatened, Endangered, Proposed, and Candidate Species

3.3.2.1. Threatened and Endangered Species

3.3.2.1.1. Black-footed ferret

The USFWS block-cleared the PRB for black-footed ferret populations in 2011. This project does not occur in a black-footed ferret population or potential reintroduction area. The black-footed ferret is endangered under the ESA. The PRB FEIS discussed the affected environment for black-footed ferrets, p. 3-175. Active reintroduction efforts reestablished populations in Mexico, Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. The WGFD identified 6 prairie dog complexes (Arvada, Sheridan, Pleasantdale, Four Corners, Linch, Kaycee, and, Thunder Basin National Grasslands) partially or wholly within the BFO administrative area as potential black-footed ferret reintroduction sites (Grenier et al. 2004). Current science indicates that a black-footed ferret population requires at least 1,000 acres of black-tailed prairie dog colonies for survival (USFWS 2008). The project area intersects prairie dog colonies with a combined acreage of approximately 204 acres. Black-footed ferret habitat is not present within the project area and it is unlikely that the species occurs.

3.3.2.1.2. Blowout Penstemon

The project area does not contain habitats suitable for supporting blowout penstemon. Blowout penstemon is endangered under the ESA. It is a regional endemic species with documented populations in the Sand Hills of west-central Nebraska and the northeastern Great Divide Basin of Carbon County, Wyoming. Suitable blowout penstemon habitat consists of sparsely vegetated, early successional, shifting sand dunes and blowout depressions created by wind. 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.

3.3.2.1.3. Ute Ladies'-Tresses Orchid

The Ute ladies'-tresses orchid (ULT) is listed as threatened under the ESA. The PRB FEIS discussed the affected environment for ULT, p. 3-175.

ICF biologists identified potential ULT habitat along Beaver Creek near 2 filled reservoirs in Section 14, and also along the unnamed tributary that flows east to west through Section 13-16, T47N:R75W in 2008. Large pools and some small pools occurred along these drainages, and many areas contained stands of mesic and wetland vegetation. Common species in these areas include cattails (*Typha* spp.), rushes, sedges, foxtail barley (*Hordeum jubatum*), prairie cordgrass (*Spartina pectinata*), muhly (*Muhlenbergia* spp.), milkweed (*Asclepias* spp.), mint (*Mentha* spp.), American licorice (*Glycyrrhiza lepidota*), smooth scouring rush (*Equisetum laevigatum*), cocklebur (*Xanthium strumarium*), Canada thistle (*Cirsium arvense*), and curly dock (*Rumex crispus*). Most areas are characterized by dense (less than 10% bare ground) and tall vegetation (16 to 40 inches), but there is evidence of grazing in some areas.

Suitable orchid habitat is present within the Napier Road project area. ICF biologists conducted surveys in the summers of 2009 and 2010 for flowering stalks of ULT; none were found. Areas surveyed by ICF biologists in 2010 included the proposed discharge point in SENE Section 14, a proposed infrastructure crossing along Beaver Creek in NESW Section 14, and two proposed infrastructure crossings along Beaver Creek in NENW Section 22 and SWSE Section 8 T47N:R75W. Three tributaries of Beaver Creek in SENW Section 17, NWNE Section 21, and NENE Section 26 T47N:R75W were also searched in 2010. Biologists also searched the drainage running southwest from Charlie Reservoir in SESW Section 24, and 2 proposed infrastructure crossings in NESW Section 7 and SESW Section 6 T47N:R75W.

3.3.2.2. Candidate Species

3.3.2.2.1. Greater Sage-grouse

USFWS warranted but precluded for higher priorities, the sage-grouse for federal listing across its range in 2010. In addition to being a Wyoming BLM sensitive species, sage-grouse are a WGFD species of

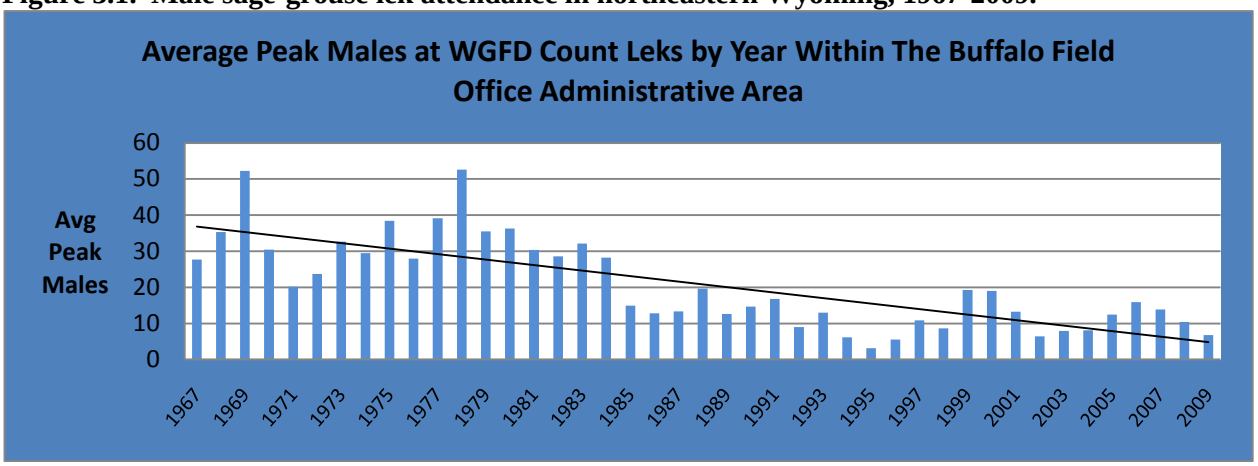
greatest conservation need, because populations are declining and they are experiencing ongoing habitat loss. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. USFWS also lists them as a BCC for Region 17.

Powder River Basin

The PRB serves as a link between the Wyoming Basin and central Montana grouse populations. The PRB is in sage-grouse Management Zone 1, which is predominantly grasslands and approaches the periphery of sage-grouse distribution that extends into the Dakotas and southern Saskatchewan. In the PRB sagebrush is more heterogeneously distributed, and where found, is at lower densities (less canopy cover), than it is in other management zones. In the context of habitat structural quality within the PRB, the project area contains quality habitat.

The sage-grouse population in northeast Wyoming is exhibiting a steady long term downward trend, as measured by lek attendance (WGFD 2008b). The following figure illustrates a 10-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Research suggests that these declines may be a result, in part, of CBNG development in this region of Wyoming and that the leks in the project area are experiencing similar declines (USFWS 2010).

Figure 3.1. Male sage-grouse lek attendance in northeastern Wyoming, 1967-2009.



Research shows that declines in lek attendance are correlated with oil and gas development. In a typical landscape in the PRB, energy development within 2 miles of leks is projected to reduce the average probability of lek persistence from 87% to 5% percent (Walker et al. 2007). Several studies show that well density is useful as a metric for evaluating impacts to sage-grouse, as measured by declines in lek attendance (Braun et al. 2002, Holloran et al. 2005, and Walker et al. 2007). These studies indicate that oil or gas development exceeding approximately 1 well pad per square mile, resulted in calculable impacts on breeding populations, as measured by the number of male sage-grouse attending leks (State Wildlife Agencies' Ad Hoc Committee for Sage-Grouse and Oil and Gas Development 2008).

Declines in lek attendance associated with oil and gas development may be a result of a suite of factors; however, fragmentation of habitat is the predominant issue (USFWS 2010). Wyoming adopted a "core area" concept that protects the largest populations of sage-grouse. The BLM adopted this concept and added "focus areas" in the PRB area to supplement the core concept. Sage-grouse core/focus areas assume those sufficient amounts of good quality sage-grouse habitat remains un-fragmented by energy or other man-made infrastructure. These basic concepts for management are based on the assumptions that sufficient "islands" of undisturbed (by human infrastructure) sage-grouse habitat would remain to sustain a large enough sage-grouse population for the long-term.

State-wide, core population areas are probably sufficient since they encompass approximately 70 percent of the sage-grouse population; however, in the PRB area the core population / focus areas capture approximately 25 percent of the PRB area's sage-grouse population. To address this inadequacy of core/focus areas in the PRB, the BLM, in coordination with the State of Wyoming identified areas (between core areas in Wyoming and Montana) as "Connectivity" habitat in an effort to maintain a viable greater sage-grouse population in the PRB area.

Sagebrush communities occur throughout and surrounding the Napier Road project area. A BLM biologist observed extensive sage-grouse sign in S21, and W1/2 S17 T47N R75W and in S31 T48N R75W during an onsite visit, and noted the habitat was suitable. Outside the Napier Road POD boundary, an existing two-track road occurs within 0.25 miles of the Kaufman Draw lek, coming as close as 0.1 miles to the center of the lek. The Napier Road, as well as several unidentified two tracks, runs within 0.25 miles of the Cottonwood lek. These roads near the Cottonwood lek and the Kaufman Draw lek are for accessing wells in other CBNG PODs and predated the advent of the BLM's sage-grouse policy.

Habitat models for wintering sage-grouse habitat predict that the project area contains excellent wintering habitat in most of the project area, excluding portions of Sections 30 and 31 in T48N R75W. During onsites the BLM wildlife biologist did evaluate the sage grouse winter and nesting habitat. The findings in the field are consistent with the habitat model. The nesting habitat model does predict large amounts of excellent nesting habitat in the other portions of the project area, particularly in Sections 2,6, 7, 11, 14, 17, 18, 20, 21, 22, and 23 T47N R75W, and in Sections 30 and 31 T48N R75W. During onsite field inspection, BLM wildlife biologist found the habitat quality consistent with the habitat model.

The State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008) recommends that BLM consider impacts for leks within 4 miles of oil and gas developments. WGFD records indicate that 8 sage-grouse leks occur within 4 miles of the project area. BLM identified these 8 lek sites in the following table.

Table 3.5. Sage-grouse Leks Within 4 Miles of the Napier Road Project Area (NRPA)

Lek Name	Legal Location	Distance from NRPA (mi)	Occupied?	WGFD Impact Category*
Beaver Creek	SWNE S4 T47N R76W	2.8	Yes	Extreme
Cottonwood	NESE S1 T47N R75W	0.6	Yes	Extreme
Gilkie Ranch	SESW S1 T46N R76W	3.7	Yes	Extreme
Kaufman Draw	NWNW S18 T47N R75W	0.2	Yes	Extreme
Morgan Draw	NWNW S11 T48N R76W	3.6	Yes	Extreme
Napier	SWSW S15 T48N R76W	2.9	Yes	Extreme
North Beaver Creek	NWSE S31 T47N R74W	1.3	Yes	Extreme
Upper Kaufman Draw	SESE S24 T47N R76W	1.8	Yes	Extreme

There are currently 1396 wells (Wyoming Oil and Gas Conservation Commission (WOGCC) (as of September 2009) within 4 miles of the 8 leks listed above, an area of 208 square miles. This amounts to a density of approximately 6.7 wells per square mile, which exceeds the effects threshold of 1 well pad per square mile described by the State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat.

*In, *Recommendations for Development of Oil and Gas Resources within Important Wildlife Habitats* (2009), WGFD categorized impacts to sage-grouse by number of well pad locations per square mile within 2 miles of a lek and within identified nesting/brood-rearing habitats greater than 2 miles from a lek. Moderate impacts occur when well density is between 1 and 2 well pad locations per square mile or

where there is less than 20 acres of disturbance per square mile. High impacts occur when well density is between 2 and 3 well pad locations per square mile or when there are between 20 and 60 acres of disturbance per square mile. Extreme impacts occur when well density exceeds 3 well pad locations per square mile or when there are greater than 60 acres of disturbance per square mile.

3.3.3. BLM Sensitive Species

Wyoming BLM prepared a list of sensitive species on which to focus management efforts 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 FLPMA; and the Department Manual 235.1.1A. Furthermore the effected regulatory environment includes the MBTA which prohibits the taking of migratory birds, their parts, nests, or eggs by any means or manner and intent there is no need to prove intent. An analysis of the BLM Wyoming sensitive species likely impacted beyond the level analyzed in the PRB FEIS follows.

3.3.3.1. Bald Eagle

The PRB FEIS described the affected environment for bald eagles, p. 3-175. The bald eagle was a threatened species under the ESA during the PRB FEIS drafting and approval. Due to successful recovery efforts the bald eagle lost ESA-protective status on August 8, 2007. The bald eagle remains under the protection of the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act.

In addition to its listing as a Wyoming BLM sensitive species, bald eagles are a WGFD SGCN with a NSS2 rating, due to populations being restricted in numbers and distribution, ongoing loss of habitat, and sensitivity to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. USFWS lists them as a BCC for Region17.

Power poles provide attractive perch sites in areas where mature trees and other natural perches are lacking. From May 2003 through December 28, 2006, USFWS Law Enforcement salvage records for northeast Wyoming identified that 156 raptors, including 1 bald eagle, 93 golden eagles, 1 unidentified eagle, 27 hawks, 30 owls, and 4 unidentified raptors were electrocuted on power poles in the PRB (USFWS 2006a). Of the 156 raptors electrocuted 31 were at power poles that are considered new construction (post 1996 construction standards). Additionally, 2 golden eagles and a Cooper's hawk were killed in apparent mid span collisions with power lines (USFWS 2006a).

Bald eagle winter roosting and nesting habitat exists in the project area, and the species is known to occur. For a description of suitable habitats refer to *Habitat Types*, Section 3.3.1. Winter roost surveys were conducted by ICF on December 14, 2009, January 16 and 18, 2010 and February 18, 2010. Four bald eagles were documented near the project area. One adult bald eagle was perched in a cottonwood tree in NENE S17, T47N R75W in December. One adult bald eagle flew in SENE S7, T47N R75W on January 16, 2010. Two bald eagles were documented in February; one adult perched in a cottonwood tree in NWNE S12, T47N R76W, and one juvenile perched in a cottonwood tree in NENW S16, T47N R75W. No other bald eagles were observed by ICF during any other surveys. Databases maintained by the BLM-BFO indicate that eagles were observed along Beaver Creek within 1 mile of the project area in 2004, 2006, 2007, 2008, and 2009.

3.3.3.2. Brewer's Sparrow

The PRB FEIS discussed the affected environment for Brewer's sparrow on p. 3-200. In addition to being a BLM Wyoming sensitive species, Brewer's sparrows are a WGFD SGCN, with a rating of NSS4 because populations are declining, habitat is vulnerable with no ongoing loss, and the species is not sensitive to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. USFWS lists them as a BCC for Region 17.

Brewer's sparrow habitat exists, and the species is known to occur in the project area. ICF biologist documented Brewer's sparrows in several locations throughout the project area during ground surveys in 2008 and 2010. In addition, on May 29, 2008, a nest with 5 eggs was documented in NESE S26, T47N R75W. Refer to Sections 3.3.1., Habitat Types, and 3.3.2.2.1., Greater sage-grouse, for a detailed description of the sagebrush type habitats in the project area.

3.3.3.3. Ferruginous Hawk

The PRB FEIS discussed the affected environment for ferruginous hawk, p. 3-183. The Memorandum of Understanding (BLM MOU WO-230-2010-04) between the U.S. Department of the Interior's BLM and the USFWS outlines a collaborative approach to promote the conservation of migratory bird populations through Executive Order 13186, 66 Fed. Reg. 3853 (January 17, 2001). This MOU reads that the "BLM will follow all migratory bird permitting requirements for activities subject to 50 CFR part 21, p. 8, item Q. While working through the permitting process with USFWS, the BLM will, to the maximum extent practicable, minimize the intentional take of species of concern and, if necessary, develop standards and procedures regarding such take."

Wyoming is the approximate center of the ferruginous hawk breeding range and has one of the largest breeding populations of any state or province. Ferruginous hawks are a WGFD SGCN, with a rating of NSS3 because the species is widely distributed with ongoing habitat loss, known population status and trends have declined in the PRB (BLM database). Research suggests that ferruginous hawks are sensitive to disturbance during the breeding season (Olendorff 1973, Gilmer and Stewart 1983, Schmutz 1984, White and Thurow 1985, Bechard et al. 1990). Ferruginous hawks strong tendency is to select nest sites that avoid human habitation or disturbance (Lokemoen and Duebbert 1976, Schmutz 1984). Once they select a nest site, ferruginous hawks are likely to abandon nest sites that are subject to disturbance (Snow 1974, White and Thurow 1985). When abandonment occurs, it tends to happen prior to hatching, so incubation represents a critically important time for reduced disturbance (Snow 1974, White and Thurow 1985). Sensitivity to disturbance may be inversely related to prey availability (White and Thurow 1985). Nests in proximity to disturbance produce fewer young (Olendorff 1973, Blair 1978, White and Thurow 1985). Ferruginous hawks tend to not return to breed in territories where breeding attempts in a previous year failed as a result of disturbance (White and Thurow 1985).

Wyoming BLM lists the ferruginous hawk as a sensitive species. Trends evaluated from the data collected by the BLM and stored in the BFO database indicate that ferruginous hawk populations in the PRB declined in recent years. Ferruginous hawks frequently reuse nests, but several nests may be built in an area (territory). Typically, 1 or 2 alternate nests may exist but some territories hold up to 8. Ferruginous hawk chicks are known to kick the nest apart before they fledge the nest, Later the adults may rebuilt nests even when nests were inactive within 3 years - according to observations documented in the BLM BFO database.

The RMP (1985, 2001 Amendment) defines an <u>active nest</u> as "one that has been used at least once during the previous three years." The BFO collected field office area raptor data since completion of the 2003 PRB FEIS ROD. In an evaluation of a sample data-set about 14% of the known ferruginous hawk nests would not be protected by applying the 3-year inactivity rule. For ferruginous hawks, which use multiple nests over multiple years, the period between activities for any given nest should be longer. This is an

identified regulatory gap in the RMP's mitigation protections afforded this sensitive species that also imparts impacts affecting the BFO's ability to comply with the MBTA.

Implementing protective measures for this species now is likely to maintain or improve its conservation status and may help to preclude the need for additional protections in the future. Ferruginous hawks are listed by USFWS as Birds of Conservation Concern for Region 17 and without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. USFWS recommends a 1.0 mile disturbance free buffer around ferruginous hawk nest.

Six active ferruginous hawk nests (used once during the past 3 years) are in the boundary of the proposed POD (#'s 2531, 4095, 4596, 6355, 8354, and 10288). See Appendix B, Table 3.8 for locations and history of those 6 nests. Additionally 39 known ferruginous hawk nests (#'s 684, 1425, 2782, 3735, 3879, 3884, 3885, 4091, 4563, 4568, 4569, 4570, 4707, 5222, 5864, 5873,5874, 5875, 5876, 6357, 6630, 8356, 10283, 10284, 10285, 10286, 10294, 10297, 10298, 10299, 10300, 10301,10302, 10303, 12166, 12168, 12169, 12170, and 12171), are within and / or found less than 0.5 miles from the Napier Road POD.

BLM biologists observed a ferruginous hawk flying out of a draw located in NE SW portion of S31, T48N R75W during the onsite visit. On May 5, 2010 ICF (2010) observed a ferruginous hawk perched in open grassland in SW NW Section 1 T47N:R75W. On June 2, 2010 another ferruginous hawk was seen flying in NW NE Section 8 T47:R75W (ICF 2010). On June 24, 2010 an adult ferruginous hawk was observed soaring in SW NE Section 6 T47N:R75 (ICF 2010).

3.3.3.4. Loggerhead Shrike

The PRB FEIS discussed the affected environment for loggerhead shrike on p. 3-187. In addition to being a Wyoming BLM sensitive species, the USFWS lists them as a BCC for Region 17. The Wyoming Bird Conservation Plan rates them as a Level II species, indicating they are in need of monitoring.

Loggerhead shrike habitat exists and the species is suspected to occur in the project area. Refer to Sections 3.3.1., Habitat Types, and 3.3.2.2.1., Greater sage-grouse, for a detailed description of the sagebrush type habitats also used by loggerhead shrikes in the project area.

3.3.3.5. Mountain Plover

The PRB FEIS discussed the affected environment for mountain plover (plover), pp. 3-177 to 3-178. The USFWS proposed the mountain plover for listing as a threatened species under the ESA at the time of drafting the PRB FEIS in 2003. USFWS withdrew the proposal in 2007, finding that the population was larger than had been thought and was no longer declining.

On June 29, 2010 the USFWS reinstated a December 5 2002 proposed rule (67 FR 72396) to propose listing the mountain plover as a threatened species. On May 11, 2011, the USFWS, once again, withdrew the proposed listing of the mountain plover as a threatened species. The mountain plover is a Wyoming BLM sensitive species, a WGFD SGCN, with a rating of NSS4, because population status and trends are unknown but are suspected to be stable, habitat is vulnerable without ongoing loss, and the species is sensitive to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. USFWS lists them as a BCC for Region 17.

Black-tailed prairie dog colonies totaling approximately 204 acres in size occur with 0.25 miles of the project area. Grass height is greater than 12 inches within these black-tailed prairie dog colonies. The topography within the POD has slopes that range from 2% to 8%. Potential plover habitat exists in the project area because the vegetation height may be reduced in the future by years of drought, increased grazing activity, or a range fire. Surveys by ICF discovered no mountain plovers.

3.3.3.6. Sage Sparrow

The PRB FEIS discussed the affected environment for sage sparrow, pp. 3-200 to 3-201. Sage sparrows are a WGFD SGCN, with a rating of NSS3, because populations are restricted in distribution, habitat is restricted but not undergoing substantial loss, and they are sensitive to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action. They are also listed by USFWS as a BCC for Region 17.

Sage sparrow habitat exists, and the species is suspected to occur in the project area. Please refer to Sections 3.3.1., Habitat Types, and 3.3.2.2.1., Greater sage-grouse, for a detailed description of the sagebrush type habitats also used by sage sparrows in the project area.

3.3.3.7. Sage Thrasher

The PRB FEIS discussed the affected environment for sage thrasher on pp. 3-199 to 3-200. In addition to being a Wyoming BLM sensitive species, sage thrashers are a WGFD SGCN, with a rating of NSS4, because populations are declining, habitat is vulnerable but not undergoing loss and the species is not sensitive to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level II species, indicating the action and focus should be on monitoring and because Wyoming has a high percentage of and responsibility for the breeding population. They are also listed by USFWS as a BCC for Region 17.

Sage thrasher habitat exists and the species is known to occur in the project area. ICF biologists documented sage thrashers singing in sagebrush habitats in SESW S30, T48N R75W and SENE S25, T48N R76W on June 24, 2010. Refer to Sections Habitat Types, 3.3.1., and Greater sage-grouse, 3.3.2.2.1., for a detailed description of the sagebrush type habitats also used by sage thrashers in the project area.

3.3.3.8. Western Burrowing Owl

The PRB FEIS discussed the affected environment for Western burrowing owl (burrowing owl), p. 3-186. In addition to being a Wyoming BLM sensitive species, burrowing owls are a WGFD SGCN, with a rating of NSS4 because the species is widely distributed, population status and trends are unknown but are suspected to be stable, habitat is restricted or vulnerable without substantial recent or on-going loss, and it may be sensitive to human disturbance. The Wyoming Bird Conservation Plan rates them as a Level I species, indicating they are clearly in need of conservation action, and they are also a USFWS BCC in Region 17. Burrowing owl habitat (prairie dog colonies) is in the project area, and the species is suspected to occur. See Black-tailed Prairie Dog Section 3.3.3.9., below, for locations of prairie dog colonies.

3.3.3.9. Black-tailed Prairie Dog

The PRB FEIS discussed the affected environment for black-tailed prairie dogs, (p. 3-179). When the PRB FEIS was written, the black-tailed prairie dog was on the list of candidate species for federal listing in 2000 (USFWS 2000). USFWS vacated the proposal 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 SGCN, with a rating of NSS3, because populations are declining, and habitat is vulnerable but not undergoing significant loss.

Three black-tailed prairie dog colonies, totaling 204.4 acres, exist in the POD in SENE S1, T47N:R76W, S7, and SWNW S18, T47N:R75W. Prairie dogs occupy the first and last colonies.

3.3.3.10. Swift Fox

The PRB FEIS discussed the affected environment for swift fox on p. 3-189. In addition to being a BLM WY sensitive species, the swift fox is also a WGFD SGCN, with a rating of NSS4, because population status and trends are unknown but are suspected stable, and habitat is vulnerable but is not undergoing

substantial loss. Swift fox was warranted for threatened species listing but precluded by higher priorities in 1994. Landowners and conservation agencies greatly increased species conservation and re-populated it in extirpated ranges. The USFWS removed swift fox from listing consideration in 2001.

Swift fox habitat is present in the project area, and the species is known to occur. ICF biologists documented a mated pair of swift fox in SESE S14, T47N R75W, defending (barking and posturing) a territory and possible den site on May 13, 2008. During onsite inspection, a suspected swift fox den was observed along access road to the proposed Pine 4 (NESW S23 T47N R75W) well.

3.3.4. Big Game

BLM biologists observed pronghorn and mule deer during the field visit to the project area. WGFD data indicate that the project area contains yearlong range for pronghorn and yearlong and winter yearlong range for mule deer. 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.

Populations of pronghorn and mule deer within their respective hunt areas are above the WGFD population objectives. The most current big game range maps are available from WGFD.

3.3.5. Aquatics

Beaver Creek is the most significant drainage in the project area. It flows northwest to the Powder River, which is approximately 10 miles from the POD. The majority of the project area drains into Beaver Creek via Kaufman Draw, Charlie Draw, Pinette Draw, and unnamed drainages. The PRB FEIS discussed the PRB ecosystem and fishery, (pp. 3-153 to 3-166). The U.S. Geological Survey (USGS) sampled northeast Wyoming perennial streams between 1980 and 1981 that generally supported invertebrate communities which included taxa adapted to flowing water. Ephemeral stream communities generally hosted taxa adapted to standing water (Peterson 1990).

Table 3.6 lists the fish that occur in the Upper Powder River sub-basin and their WGFD NSS designation, if applicable. WGFD identified SGCN within the state, all of which are given NSS designations. Seven of the species that may occur in the Upper Powder River sub-basin have designations as either NSS 1, 2, or 3 species. Species in these designations are species of concern, in need of more immediate management attention, and more likely subject to future petitioning under the ESA. For these species WGFD recommends that no loss of habitat function occur. WGFD allows for some modification of the habitat, provided that habitat function is maintained (i.e., the location, essential features, and species supported are unchanged). NSS 4-7 refers to populations that are widely distributed throughout their native range and are stable or expanding. Habitats also are stable. There is no special concern for these species.

Table 3.6. Fish Occurring in the Upper Powder River Sub-basin

Wyoming Native Species Status	Species	Wyoming BLM Sensitive?
NSS1	Sturgeon chub	No
NSS2	Goldeye	No
	Sauger	No
NSS3	Black bullhead	No
	Flathead chub	No
	Mountain sucker	No
	Plains minnow	No

Table 3.6. Fish Occurring in the Upper Powder River Sub-basin

Wyoming Native Species Status	Species	Wyoming BLM Sensitive?
NSS4	Channel catfish	No
	Northern redhorse	No
	Quillback	No
	River carpsucker	No
	Stonecat	No
NSS6	Fathead minnow	No
	Plains killifish	No
NSS7	Longnose dace	No
	Sand shiner	No
	White sucker	No
None	Common carp	No
	Rock bass	No
	Shovelnose sturgeon	No

Source: BLM 2010c.

Amphibian and reptile species (herpetiles) occur throughout the Basin. WGFD conducted a baseline inventory of herpetiles along the Powder River and its major tributaries from 2004-2006 (Turner 2007).

WYNDD completed the first year of a 3-year herpetile study in the PRB in order to detect impacts from CBNG development (Griscom et al. 2009). Herpetiles expected to occur in the PRB, according to these studies, are listed in Table 3.7 (Turner 2007; Griscom et al. 2009). WGFD classified 8 of the species as SGCNs, all with a rating of NSS4, indicating that they have wide distribution throughout their native ranges, and populations are stable. Of the species listed in Table 3.7, WYNDD reported that, for 2008 surveys, boreal chorus frogs were the most abundant amphibian in the PRB and were in a variety of habitats. The second most abundant amphibian was Woodhouse's toad, which occurred along rivers, temporary ponds, and in CBNG reservoirs. Plains spadefoot and Great Basin toads were the least common species, occurring primarily in temporary ponds fed by rainstorms. Relatively few observations were made for reptile species. Bullsnakes and sagebrush lizards were most commonly seen. Turtles were rarely observed, due to their almost exclusive occurrence in deep backwaters.

Two of the herpetiles listed in Table 3.7, northern leopard frog and Columbia spotted frog, are Wyoming BLM sensitive species. In 2008, the Wyoming Natural Diversity Database (WYNDD) began a 3-year study of amphibians and reptiles in the PRB under the guidance of the ATG. The ATG is an inter-agency and inter-state working group focused on studying and mitigating impacts of energy development on aquatic ecosystems in northeastern Wyoming and southeastern Montana. Northern Leopard Frogs were estimated to occupy 42% of water bodies surveyed in 2010 in the PRB.

Table 3.7 Herpetile Species Expected to Occur in the Powder River Basin

Species	Verified by Survey[1]	WGFD Status	Wyoming BLM Sensitive?
Tiger salamander	Yes	NSS4	No
Northern leopard frog	Yes	NSS4	Yes
Milk Snake	No	NA	No
Columbia spotted frog	Yes	NSS4	Yes

Table 3.7 Herpetile Species Expected to Occur in the Powder River Basin

Species	Verified by Survey[1]	WGFD Status	Wyoming BLM Sensitive?
Bullfrog	Maybe	NSS4	No
Spiny softshell	Yes	NA	No
Northern prairie lizard	No	NA	No
Boreal chorus frog	Yes	NSS4	No
Great plains toad	Yes	NSS4	No
Woodhouse's toad	Yes	NSS4	No
Plains spadefoot toad	Yes	NSS4	No
Short-horned lizard	Yes	NA	No
Sagebrush lizard	Yes	NA	No
Eastern yellowbelly racer	Yes	NA	No
Prairie rattlesnake	Yes	NA	No
Western hog-nosed snake	Yes	NA	No
Bullsnake	Yes	NA	No
Terrestrial garter snake	Yes	NA	No
Plains garter snake	Yes	NA	No
Common garter snake	Yes	NA	No
Snapping turtle	Yes	NA	No
Painted turtle	Yes	NA	No

[1] As reported in Turner (2007) and Griscom et al. (2009).. Source: BLM 2010c.

3.3.6. Migratory Birds

The PRB FEIS discussed the affected environment for migratory birds, (pp. 3-150 to 3-153). Sagebrush communities are the primary vegetation type (migratory bird habitat) in the project area. Migratory birds most dependent on sagebrush ecosystems for survival are considered obligates (e.g., sage thrasher, Brewer's sparrow, sage sparrow) (Rowland et al. 2006). Many of these species are socially and/or ecologically important, including several Wyoming BLM sensitive species. Biologists observed waterfowl during the onsite process approximately 4 miles NE in Section 5 T74N, R75W.

3.3.7. Raptors

The PRB FEIS discussed the affected environment for raptors on pp. 3-141 to 3-148. Eighty-five known raptor nests occur within 0.5 miles of the Napier Road POD, and 21 of those nests are active. The BFO RMP (1985, 2001 Amendment) defines an active nest as, "one that has been used at least once during the previous three years." BLM documented 5 species using these nests: ferruginous hawk, red-tailed hawk, golden eagle, great horned owl, and one American kestrel.

3.3.8. West Nile Virus

West Nile virus (WNv) is a mosquito-borne disease that can cause encephalitis or brain infection. Mosquitoes spread this virus after they feed on infected birds and then bite people, other birds, and animals. WNv is not spread by person-to-person contact, and there is no evidence that people can get the virus by handling infected animals.

WNv firmly established and spread across the United States since its discovery in 1999 in New York. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. Though less than

1% of mosquitoes carry WNv, they still are effective in transmitting the virus to humans, horses, and wildlife. *Culex tarsalis* appears to be the most common mosquito to vector, WNv.

The human health issues related to WNv are well documented and appear to have leveled off. Historic data collected by the CDC and published by the USGS at: www.westnilemaps.usgs.gov is summarized in Table 3.10. Reported data from the PRB includes Campbell, Sheridan and Johnson counties.

Table 3.10. Historical West Nile Virus Information

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

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

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

Although most of the attention focused on human health issues, WNv had an impact on vertebrate wildlife populations. At a recent conference at the Smithsonian Environmental Research Center, scientists disclosed WNv was detected in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations incurred very high mortality, particularly crows, jays and related species. Raptor species also appear to be highly susceptible to WNv.

Researchers documented that 36 raptors died from WNv in Wyoming in 2003. These included golden eagle, red-tailed hawk, ferruginous hawk, American kestrel, Cooper's hawk, northern goshawk, great-horned owl, prairie falcon, and Swainson's hawk (Cornish et al. 2003). Actual mortality is likely to be greater. Population impacts of WNv on raptors are unknown at present. The Wyoming State Vet Lab determined 22 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, Holloran 2005, Clark 2006, Walker 2011, 2007).

Mosquitoes can potentially breed in any standing water that lasts more than 4 days. In the PRB 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. (See Zou 2006.) Preliminary research conducted in the PRB indicates WNv mosquito vectors were notably more abundant on a developed CBNG site than 2 similar undeveloped sites (Walker et al. 2003). Reducing the population of mosquitoes, especially species that are apparently involved with bird-to-bird transmission of WNv, such as *Culex tarsalis*, can help to reduce or eliminate the presence of virus in a given geographical area (APHIS 2002). The most important step any property owner can take to control such

mosquito populations is to remove all potential man-made sources of standing water in which mosquitoes might breed (APHIS 2002).

The most common pesticide treatment is to place larvicidal briquettes in small standing water pools along drainages or every 100 feet along the shoreline of reservoirs and ponds. It is generally accepted that it is not necessary to place the briquettes in the main water body because wave action prevents this environment from being optimum mosquito breeding habitat. Follow-up treatment of adult mosquitoes with malathion may be needed every 3 to 4 days to control adults following application of larvicide (Mooney, personal conversation). These treatment methods seem to be effective when focused on specific target areas, especially near communities, however they have not been applied over large areas 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 in the Upper Powder River drainage. The Napier Road POD is in the Upper Beaver Creek and Upper Dead Horse Creek drainage - tributaries of the Upper Powder River. The areas are dissected by ephemeral drainages which flow into intermittent Beaver Creek (south) and Dead Horse Creek (north) drainages. The ephemeral drainages have gentle slope with well vegetated bottoms with numerous small head-cut features.

The Wyoming Department of Environmental Quality (WDEQ) 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 historical use for groundwater in this project area is for stock or domestic water. The WSEO Ground Water Rights Database for this area showed 16 registered stock and domestic water wells within 1 mile of a federal CBNG producing well in the POD with depths from 120 to 589 feet. For additional information on water, refer to the PRB FEIS (2003), Chapter 3, Affected Environment pp. 3-1 to 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, 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.

Specific to groundwater, the plan identified the following, (PRB FEIS ROD, p. E-4):

- The effects of infiltrated waters on the water quality of existing shallow groundwater aquifers are not well documented at this time [2003];
- Potential impacts will be highly variable depending upon local geologic and hydrologic conditions;
- It may be necessary to conduct investigations at representative sites in the basin to quantify 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. BFO monitors coal zone pressures as expressed in depth to water from surface since the early 1990s in the PRB, Figure 3.3.

Bill Barrett's Beaver Creek POD has 158 approved federal wells and there are numerous of other federal, state and fee wells drilled in the vicinity of Napier Road POD. As a result the target coal zone pressure may have been reduced through off set water production. The Napier Road groundwater monitoring well and the Beaver Creek Federal ground monitor well were installed by Bill Barrett and Anadarko, respectively, as a part of the BLM deep groundwater monitoring program.

Napier Monitor Well: The initial water level of the Big George coal, was recorded at 432.0 feet below ground level on May 20, 2001. The most recent measurement, March 2011 recorded the water level at 821.6 feet below ground level, for a decline of 389.6 feet since completion of the well.

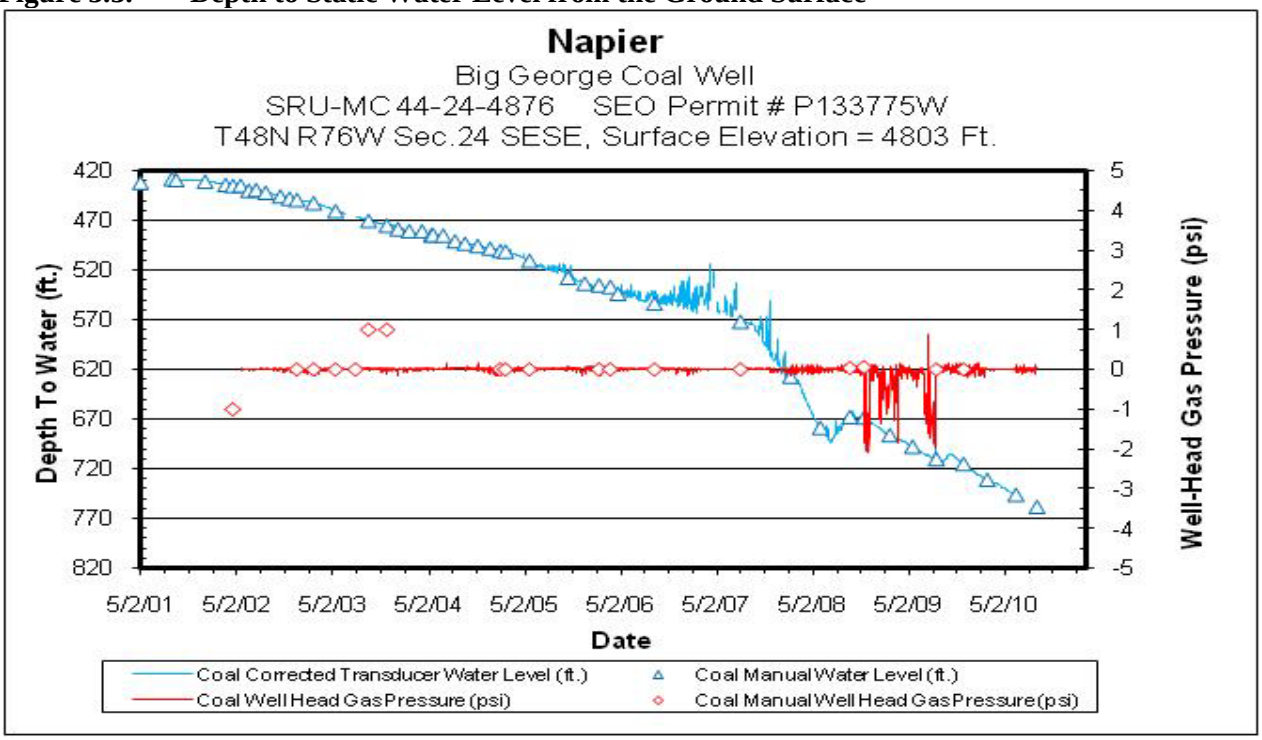
Beaver Creek Federal Monitor Well: The initial water level of the Big George coal, was recorded at 330.8 feet below ground level on April 18, 2003. The most recent measurement, June 2009 recorded the water level at 835.0 feet below ground level, for a decline of 504.2 feet since the well was completed. More recent data is not available due to extremely high wellhead gas pressures (>100 psi).

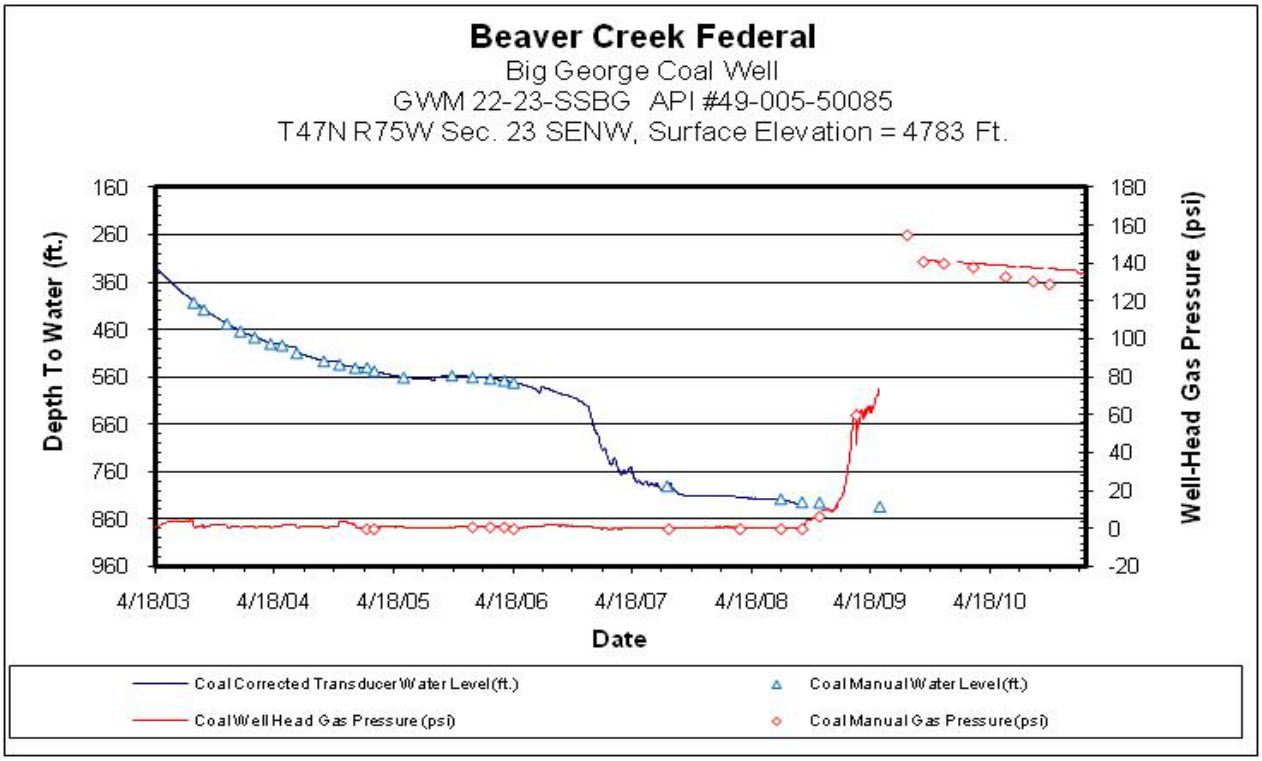
Table 3.11. Monitor Wells in the Big George Coal Zones Near Napier Road POD

Monitor Well Name	QtrQtr	Sec	T N	R W	Distance from Napier POD, (mi)	Total Depth, (ft)	Initial WL, ft depth from surface	Most Recent WL, ft depth from surface	Drilled by	Date Installed
Napier Road	SESE	24	48	76	0.5	1,705	432.0	821.6	Bill Barrett	5/20/2001
Beaver Creek Federal	SESE	24	47	75	within POD	1,256	330.8	835.0	Anadarko	4/18/2003

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, 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 at: http://www.wsgs.uwyo.edu.

Figure 3.3. Depth to Static Water Level from the Ground Surface





3.4.2. Surface Water

The project area is in the Beaver Creek and Dead Horse Creek drainages which are tributaries to the Upper Powder River drainage. Most of the area drainages are ephemeral (flowing only in response to a precipitation event or snow melt) to intermittent (flowing only at certain times of the year when it

receives water from alluvial groundwater, springs, or other surface source – PRB FEIS, Chapter 9 Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank.

The PRB FEIS presents the historic mean electrical conductivity (EC, in μmhos/cm) and sodium adsorption ratio (SAR) by watershed at selected USGS Gauging Stations in Table 3-11 (PRB FEIS, p. 3-49). These water quality parameters "illustrate the variability in ambient EC and SAR in streams in the project area. The representative stream water quality is used in the impact analysis presented in Section 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, p. 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 4.7 at maximum monthly flow to 7.8 at low monthly flow. The USGS station at Arvada, WY determined these values (PRB FEIS, p. 3-49).

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

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

3.5. Economics of CBNG Resource Extraction

Three types of fluid minerals are known in the Napier Road project area: conventional natural gas, oil, and CBNG. Natural gas and oil production are declining in the Napier Road project area and the PRB in general. (BLM-Wyoming Reservoir Management Group)

Wyoming's annual oil production peaked at 160 million barrels in the early 1970's and declined since (WOGCC 1998). Three hundred thirty-six fields were producing nearly 25 million barrels of oil and 60 MMCF of conventional natural gas in Wyoming in 2000 (WOGCC 2001). Production in the PRB comes from upper and lower Cretaceous sediments and from upper Paleozoic sediment in the northeastern part of the basin (Lageson and Spearing 1991).

It is estimated that approximately 28 trillion cubic feet (tcf) of CBNG may be recoverable from the coal beds in Wyoming's PRB. CBNG in the PRB is almost entirely methane (CH_4) and nitrogen (N). A large percentage of the CBNG escapes to the surface or migrates into nearby rocks during the coalification process. Some of the gas is trapped and stored in coal beds in 1 of the following 4 ways:

- As free gas in tiny pores or fracture within the coal;
- As dissolved gas in water with the coal;
- As adsorbed gas on the coal surfaces; or
- As adsorbed gas with coal molecules (Debruin et al. 2001).

3.5.1. Current Conditions and Trends

This project's development will affect the local, state, and national economies. Based on the estimates in the BLM's 2009 reasonably foreseeable development (RFD) scenario, the drilling of the CBNG wells in the PRB will generate approximately 0.23 billion cubic feet of gas (BCFG) per well, over the life of the well. Actual revenue from this amount of gas is difficult to calculate, as there are several variables contributing to the price of gas at any given time. Regardless of the actual dollar amount, the royalties from the gas produced would have several benefits. The federal government collects 12.5% of the royalties from all federal wells, which offsets the costs of maintaining the federal agencies that oversee permitting. In addition to generating federal revenue, approximately 49% of the royalties from the federal wells would return to the State of Wyoming. Mineral development revenue contributes to Wyoming's economy, and allows for improvements in state funded programs such as infrastructure and education.

Federal wells also contribute to local economic development by employing workers in the area to build the roads and project infrastructure, drill the wells, and maintain and monitor the project area.

There are 68 existing CBNG, conventional gas, and oil wells on federal mineral estate and non-federal mineral estate within Napier Road POD boundary. Assuming an 80 acres spacing pattern (8 wells per square mile), the proposed Napier Road CBNG wells would bring the total to 89 wells which rates as fully developed according to WOGCC. It is RFD that this POD and those adjacent may eventually add wells to the 80-acre spacing industry convention.

3.6. Cultural Resources

Yates performed a class III cultural resource inventory for the Napier Road POD prior to on-the-ground project work (BFO project no. 70080211). Yates provided BFO with a 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 BLM standards, and determined it adequate. The following resources are in or near the project area.

Site Number	Site Type	Eligibility
48CA3368	Prehistoric Site	Not Eligible
48CA5052	Historic Site	Not Eligible
48CA5053	Historic Site	Not Eligible
48CA5142	Historic Site	Not Eligible
48CA5143	Prehistoric Site	Not Eligible
48CA5172	Historic Site	Not Eligible
48CA5173	Historic Site	Not Eligible
48CA5174	Historic Site	Not Eligible
48CA5175	Historic Site	Not Eligible
48CA6177	Historic and Prehistoric Site	Unevaluated
48CA6911	Historic and Prehistoric Site	Not Eligible
48CA6912	Historic and Prehistoric Site	Not Eligible
48CA6913	Historic and Prehistoric Site	Not Eligible
48CA6914	Prehistoric Site	Not Eligible
48CA6915	Historic Site	Not Eligible

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

3.7. Air Quality

Existing air quality throughout most of the PRB is in attainment with all ambient air quality standards. Specific air quality monitoring in the PRB occurs at 3 Wyoming state sites: Cloud Peak; Thunder Basin (NE of Gillette); and Campbell County (SSW of Gillette). Air quality in rural areas is generally very good (ozone less than 60 parts per billion (ppb), minimal nitrous oxide (NO_x) and volatile organic compounds (VOCs)). However in recent years the region had some ozone ratings between 65 and 70 (ppb) and had a few air quality advisories due to dust, of which it is thought that coal dust contributed. The area has few and dispersed emission sources (few industrial facilities and residential emissions in the relatively small

communities and isolated ranches) and good atmospheric dispersion, resulting in relatively low air pollutant concentrations and does not have a “bowl-like” topography which may trap low-hanging ozone layers, but instead the open topography fosters low-level air exchange (high winds). Yet the air quality issue is receiving greater monitoring and regulatory scrutiny in Wyoming since the ozone (smog) in the Upper Green River Basin exceeded the worst in the nation for 13 days in 2011 and had air quality issues since 2005 due, in part, to affects from oil and gas field operations.

Existing air pollutant emission sources in the region include:

- Exhaust emissions (primarily CO and nitrous oxides [NO_X]) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- 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_X, particulate matter, and other emissions from diesel trains; and
- SO_2 and NO_X from power plants.
- For a description of the 2003-era air quality conditions in the PRB, refer to the PRB Final EIS Volume 1, Chapter 3, pp. 3-291 to 3-299.

4. ENVIRONMENTAL EFFECTS

This section analyzes and describes the environmental effects of Alternatives B, p. 32, and C, p. 66, on the affected environment described in Section 3. This section analyzes Alternative B in total and only then in turn, analyzes Alternative C. This is because Alternative C comprises 2 changes from 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 PRB FEIS analyzed the No Action Alternative as Alternative 3. Additionally the recent analyses and approved CBNG developments listed in Table 3.1, in and around this POD, and shown in Table 2.5 under Alternative A, updated the baseline present circumstances and collectively, cumulatively comprise the No Action Alternative. Those analyses are incorporated by reference into this EA. Information specific to resources for this alternative is included in the PRB Final EIS on pages listed in Table 4.1, combined with the analysis in the EAs found in Table 3.1.

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

4.2. Alternative B: The Operator's Proposed Action

Alternative B contains 50 CBNG and 3 water injection APDs, 12 reservoirs (2 primary, 10 secondary) along with their infrastructure, and 2 ROWs; and is a result of the operator and BLM working to reduce environmental impacts.

4.2.1. Soils, Vegetation, and Ecological Sites

4.2.1.1. Direct and Indirect Effects

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

Construction of wells (47) with no pad and no slot would result in less soil disturbance to the soil resource, see Table 2.5. No soil would be removed or graded. Where reserve pits are constructed for these wells, soil productivity and soil quality would be altered if top soil is not salvaged and segregated or if subsoil is spread on the surface of the soil.

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

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

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

An important component of soils in Wyoming's semiarid rangelands, especially in the Wyoming big sagebrush cover type, are biological soil crusts, or cryptogamic soils that occupy ground area not covered with vascular plants. Biological soil crusts are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (Belnap et al. 2001). They are adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily damaged or destroyed by surface disturbances associated with construction activities.

Rutting affects the surface hydrology of a site as well as the rooting environment. The process of rutting physically severs roots and reduces the aeration and infiltration of the soil, thereby degrading the rooting environment. Rutting may result in mixing of topsoil and subsoil, thereby reducing soil productivity. Rutting also disrupts natural surface water hydrology by diverting and concentrating water flows creating accelerated erosion. Soil mixing typically results in a decrease in soil fertility and a disruption of soil structure.

BLM would like to recommend that private surface primitive roads in the project area should be upgraded to meet the demands that additional traffic associated with the Napier Road POD will place on them. The MSUP Road Improvements (pp. 1 and 2) for this POD are vague and BLM cannot ascertain for certain that erosion and down-cutting of primitive roads will be addressed, particularly since Yates states that road improvements on private surface will be constructed to landowner specifications – which is an express desire for minimal roads, further complicated by the fact that several CBNG operators use these primitive private roads, and the roads frequently traverse on, then off, and on again over Yates held leases. (See correspondence tab in email dated November 18, 2010). Access to the following proposed wells and reservoirs is subject to these deteriorating roads: Hamlet CS Com 1, Hamlet CS Com 2, Mahalo CS Federal Com 1, Mahalo CS Federal 2, Mahalo CS Federal 4, Mahalo CS Federal 5, Napier CS 1, Napier CS 2, Niche CS Federal Com 1, Niche CS Federal Com 2, Niche CS Federal Com 5, Niche CS Federal 6, Schofield CS Com 1,Schofield CS 2, Poncho, Soldier, Spring Fling, Twister, Vicki's Pond, and War Paint. Therefore BLM recommends approving the road improvement plans as put forth by Yates and

will require the plan be followed. This will help keep this federal undertaking in compliance with State of Wyoming requirements for WDEQ storm water pollution prevention plan (SWPPP) and help achieve the requirements set forth in the Wyoming State Reclamation Policy. If the BLM did not address the current deteriorated state of roads on private surface with the Road Improvements Section in the MSUP the State of Wyoming requirements for WDEQ SWPPP will be difficult to meet and large amount of top soil and subsoil may be irrecoverably lost into adjoining drainages. Additionally, increased erosion from water will make it difficult if not impossible to achieve the requirements set forth in the Wyoming State Reclamation Policy. Where topography exceeds 8% slope erosion will be controlled or reduced with the addition of gravel (minimum average of 4 inches) on these steep road segments.

An engineered section approximately 300 feet long is proposed to gain access to the Niche 11 well due to steep slopes, cuts/fills exceeding 5 feet and a head-cut which will be mitigated by the road proposal. The operator is responsible for having the licensed professional engineer(s) certify that the actual construction of the road meets the design criteria and is constructed to Bureau standards.

Low water crossings (LWC) are a BLM approved construction technique to allow all weather access though drainages where culverts are not appropriate or desired. BLM has construction standards which the operator chose to disregard. One LWC is called out in the project MSUP to gain access to the Mandarin 1 well location; on federal lease, WYW 126095. In the post-onsite deficiency letter dated August 12, 2010 BLM identified a deficiency; “Yates did not propose a BLM approvable LWC to access the Mandarin 1. BLM recommended Yates use their proposed construction design for a typical LWC as shown in Tab 5 Attachment D of Napier Road MSUP or provide a typical culvert for the drainage crossing to Mandarin 1.” In surface upgrade (SU17) the Operator stated the LWC would remain “primitive” having only a gravel top unless determined in the future that a template design (as in tab 5) would be required. BLM could require this LWC to be built to Yates typical LWC as shown in Attachment D of MSUP as this would help keep this federal undertaking in compliance with State of Wyoming requirements for WDEQ storm water pollution prevention plan (SWPPP) and help achieve the requirements set forth in the Wyoming State Reclamation Policy. However, BLM is permitting this LWC to be built to the surface owner’s wishes as presented by Yates. The LWC can be approved as “primitive” or a “ford” crossing for the following distinct reasons: 1) it provides access to 1 single well and traffic through the drainage should be minimal and limited to light duty pick-up trucks after drilling is complete; 2) the drainage area is less than 40 acres; 3) the drainage bottom is well vegetated and no head-cuts or active erosion were noted.; and 4) the drainage bottom slope is less than 8%. These drainage attributes should amount to low flows, low water velocity, minor scouring, and infrequent in-channel failure of the LWC. Note: BLM has been unable to reach the surface owner to confirm their preference for the construction technique of the LWC.

The seed mixes for revegetation in the Napier Road POD are determined based on soil map unit types, the dominant ecological sites found in the project area, and the mixing of soil horizons in disturbed areas. Loamy and sandy seed mixes are recommended for the POD.

The BLM will evaluate reclamation success using the requirements set forth in the BLM State Wide Reclamation Policy revised 2011.

Expanded gas, water, and electric ROW infrastructure linking POD support facilities are part of reasonably foreseeable development (RFD) additions to the proposed action (PRB ROD, p. 2). These include trends toward 80 acre spacing (8 wells per section) and changes in associated infrastructure. Such is the case with Napier Road. A foreseeable addition may be a request for a ROW to connect roads, gas and water utility lines of Napier Road and Veranda PODs. A utility corridor may link the 2 PODs from Cubical 1 southwest through Lot 15, 17, and 18 of Section 7 T47N R75W.

4.2.1.1.1. Soils Susceptible to Erosion

Sandy Ecological Sites: Well locations and access/pipeline corridors in the north half of Section 11 and south half of Section 2 T47N R75W will impact 1.5 miles or 7,920 feet of sandy ecological sites (Sandy 10-14NP) and will require expedient reclamation. Much of the sandy loams were found on ridge tops with topsoil depths averaging 2-4 inches. The dominant vegetation included; big sagebrush, rubber rabbit brush, needle and thread, prairie sandreed, blue gramma, and cheat grasses. Without proper and timely re-vegetation practices the sands readily erode due to wind action. The invasion of prickly pear and cheat grass indicates some deterioration from identified transition state. Due to the lack of slope, water erosion should be minimal, but wind erosion could be high since there is little to no depth or organic matter in the soil. Reclamation will be difficult without extra mitigation. A site specific seed mix was chosen for these locations to expedite re-vegetation and a COA will be applied to insure that the surface is stabilized to protect from wind/water erosion within 30 days.

4.2.1.1.1.1. Limited Reclamation Potential (LRP)

4.2.1.1.1.1.1. Miscellaneous Areas

Badlands, Blown-out Lands, and Rock Outcrops: The Lani CS Federal 1 well and associated infrastructure will have impacts to LRP areas - badland, blown-out land, and rock outcrop components.

Lani CS Federal 1 SU1 Access to Lani CS Federal 1 at approximately 1,100 feet from the county road will use the inslope and or side hill template to create approximately 600 linear feet of cuts and fills (3-4 feet) to transition as the access road leaves the top of the ridge. These proposed cuts and fills will have direct impacts to badland components and rock outcrops. At the onsite it was pointed out that the road must avoid these components due to their limited reclamation potential. Yates chose not to modify the road proposal and asked BLM to analyze the proposed route. BLM ID Team determined reclamation on the proposed access road would be difficult if not impossible to achieve; therefore BLM suggested several alternate well locations which would eliminate impacts to these components. BLM compared this proposed access road to other access roads in the vicinity of Napier Road POD, namely Schoonover Road Unit 4 Add 1 which was approved 2011. The Schoonover Road well 43-25 4876 was approved despite the fact it had 800 feet of engineered road which appeared to have impacts to LRP areas. BLM found the Schoonover Road well 43-25 4876 had distinct differences from the situation found at Lani CS Federal 1. 1) When the Schoonover operator was informed they should avoid LRP areas the operator rerouted the beginning of the access road to avoid steep slopes which had small inclusions of badland components. 2) The Schoonover operator also narrowed up the road's running surface near the well location to 12 feet and moved the pipeline into the middle of the road disturbance when it passed near a LRP area or blown out land. 3) A site specific reclamation plan was submitted by the Schoonover operator for the location to provide BLM some assurance the road disturbance would not impact the blown out lands and if it did impact the area a straw mulch and matting would be applied to stabilize the disturbance. 4) An approvable, alternate well location did not exist within 200 meters (656 feet) of the Schoonover Road well 43-25 4876 proposed location.

The template access road to Lani CS Federal 1 would also impact minimally protective surface vegetation, biologic soil crusts, and physical soil crusts. This would likely result in a significant expansion of the blowout to surrounding ecosystems. This expansion would affect stability, physical and chemical properties, and functionality of these sites, making mitigation of these environmental impacts impractical or unfeasible. The surrounding area which would be impacted includes drainages with steep side slopes and fragile soils. These impacts would initiate long term site instability. The site likely would not be able to be reclaimed meeting the requirements of the Wyoming Policy on Reclamation, Appendix C of this EA.

4.2.1.1.2. Cumulative Effects

The cumulative effects associated with Alternative B are very likely outside analysis parameters and

impacts described in the PRB FEIS with the approval of Lani CS Federal 1. For details on expected cumulative impacts, refer to the referenced PRB FEIS, Volume 2, Chapter 4.

The designation of the duration of disturbance is defined in the PRB FEIS (pp. 4-1 and 4-151). Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization. However the soil disturbances associated with the Lani CS Federal 1 as proposed would result in long term, severe detrimental impacts.

4.2.1.1.3. Mitigation Measures.

COAs, mitigation measures, surface upgrades, and applicant committed measures discussed in the MSUP would help to mitigate or reduce the impacts described above areas of this POD, exclusive of Lani CS Federal 1. In POD areas of steep topography, erosive soils and/or poor reclamation suitability, BLM will consider requesting a plan to stabilize topsoil within a 30-day period from the start of construction in those areas.

Impacts to soils and vegetation from surface disturbance will be reduced by following the BLM and Yates applied mitigation, apart from the analysis of Lani CS Federal 1.

- The sandy seed mix is applied to wells and access/pipelines which impact sands and sandy ecological sites (map unit symbols 165 and 188). This seed mix should be applied to access/pipeline corridors in the SESW and the SWSE of Section 2 and the NENW and NWNE of Section 11 T47N R75W. Niche 2 well will receive a sandy seed mix.
- 30 day stabilization requirement is applied to wells and access/pipelines which impact sands and sandy ecological sites (map unit symbols 165 and 188). This seed mix should be applied to access/pipeline corridors in the SESW and the SWSE of Section 2 and the NENW and NWNE of Section 11 T47N R75W. Niche 2 well will receive a 30 day stabilization requirement. A 30 day stabilization requirement is applied to the Niche11 location on the engineered section due to an existing sandy head cut which will be impacted by the engineered road. These measures must be applied to the head cut 30 days from the start of construction on the engineered section.
- Place a minimum average of 4 inches of aggregate on road segments where grades exceed 8%.
- The BLM will evaluate reclamation success using the requirements set forth in the State Wide Reclamation Policy revised 2011, see Appendix C of this EA and incorporated herein.
- The operator is responsible for having the licensed professional engineer(s) certify that the actual construction of the road meets the design criteria and is constructed to Bureau standards.

4.2.1.1.4. Residual Effects

Residual effects across the POD would include a long-term loss of soil productivity associated with well pads and roads. Residual effects were identified in the PRB FEIS (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

The identified residual effects associated with the approval of the Lani CS Federal 1 are as follows:

1. The BLM ID Team considers this proposal to have little to no reclamation potential with final reclamation bordering on difficult if not impossible to achieve.
2. The soil chemistry in badland landforms is such that pH values on the base- acid pH scale are not conducive to vegetation re-establishment
3. The surrounding area which would be impacted by the Lani CS Federal 1 includes drainages with side slopes and fragile soils. These impacts would initiate long term site instability and likely would not be able to be reclaimed meeting the requirements of the Wyoming BLM Reclamation Policy, see Appendix C of this EA.

4. The proposed Lani CS Federal 1 access road would impact thin minimally protective surface vegetation, biologic soil crusts, and physical soil crusts. This would likely result in a significant expansion of the blowout to surrounding ecosystems. This expansion would affect stability, physical and chemical properties, and functionality of these sites, making mitigation of these environmental impacts impractical or unfeasible.

Therefore the combination of these residual effects the BLM ID Team considers that Alternative B with Lani CS Federal 1 is likely outside the parameters for surface disturbance and surface disturbance reclamation found in PRB FEIS ROD.

BLM provided Yates with the following 2 locations for Lani CS Federal 1 APD to prevent severe adverse impacts to fragile soils. In addition to rejecting the recommended locations, Yates did not provide mitigation to reduce the impacts the proposed Lani CS Federal 1's access road would have on badlands, blown-out lands, and rock outcrop areas.

1. On September 20, 2010 BLM recommended the Lani CS Federal 1 be moved 0.23 miles north. This location would place the well along Napier Road and eliminate the need to impact badlands and rock outcrop areas, which should be avoided. This location would still be on Yates' lease WYW149796, but would likely be an off pattern well. Yates chose not to pursue the BLM suggested well location.

2. On October 19, 2010 BLM made the recommended that the Lani CS Federal 1 be moved approximately 127 meters (416 feet) east per 43 CFR 3101.1-2. This BLM proposed well location would eliminate the need to impact badlands and rock outcrop areas. The access road would be realigned slightly north and changed to a side hill template. This road proposal was determined through ID team meeting to have good reclamation potential. This location would still be on Yates lease WYW149796 though it may be close to the private lease to the east. Wyoming Oil and Gas Conservation Commission (WYOGCC) approval may be required at this new location and a communitization agreement may need to be formed with the adjacent private lease. Yates chose not to pursue the BLM suggested well location.

For the above reasons linked to soils with limited reclamation potential the BLM will consider denying Lani CS Federal 1 APD and its infrastructure with its proposed location, design features, and mitigation; for as shown above the proposal falls short of site-specific needs and requirements in soil with limited reclamation potential as indentified in the PRB FEIS ROD and Wyoming BLM Reclamation Policy.

4.2.1.2. Vegetation and Ecological Sites

4.2.1.2.1. Direct and Indirect Effects

Most direct and indirect effects to ecological sites and vegetation are discussed in the PRB FEIS (pp. 4-153 to 4-164). The proposed action would impact the common plant communities that occur on the site and the transition between the communities.

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

Reservoir locations are in intermittent channels and in areas with good reclamation potential. The

vegetation at the reservoir locations has fairly large stands of grass or sagebrush. For all locations the topsoil will be stripped from the deepest part of the reservoir and the dam built from the borrowed material during the deepening of the reservoir. However, due to construction costs associated with topsoil stripping not all topsoil and vegetation will be stripped up to the high water line (HWL) at each reservoir location. Consequently the vegetation will be inundated when the reservoir is filled to the HWL.

Sagebrush does not regenerate easily after human disturbance such as urban or agricultural development, or even after natural occurrences such as wildfire. It takes years, even generations, for sagebrush to fully grow back. Sagebrush still has not returned to some areas of the Columbia Basin burned by a large fire 40 years ago (Pacific Northwest National Laboratory Shrub Steppe Ecology Series May 2010).

Vegetation along the Lani CS Federal 1 road route is thin and susceptible to wind and water erosion. This is primarily due to unstable soils and physical and chemical properties that limit plant growth along the access route. This location has very thin fragile topsoil with fragile root systems used to stabilize the surface and allow plant growth. BLM calculated the entire road disturbance would amount to a total of 0.3 miles (1,426 feet) of road constructed to reach the Lani CS Federal 1 well. Of that length 0.13 miles or 600 linear feet are constructed through very thin top soil, badlands, blown-out lands and rock outcrops. This road section will disturb 0.6 acres through these features where there is 1-2 inches of topsoil and in other areas where there is zero (0) topsoil. Authorizations for surface disturbing actions are based upon the assumptions that a disturbance can ultimately be successfully reclaimed. BLM has evaluated the operator's proposal and determined the disturbance should be avoided for the following reasons:

1. The amount of quality topsoil salvaged along this access road will be inadequate to prepare the seed bed for interim and final reclamation. The soils at this location will not provide suitable surface and subsurface physical, chemical, and biological properties to support the long term establishment and viability of the desired plant community.

2. Blade work along this route would remove root zones which have held in place a fragile and naturally unstable landform, a disturbance in this landform would create an erosional condition that will preclude BLM and the operator from reaching goals set forth the in the Wyoming Reclamation policy. The fragile plant communities will along this route will be difficult if not impossible to restore, which is why these land form are commonly recommended to be avoided.

3. There is an approvable location 127 meters (416 feet) on the same lease which would completely avoid disturbance to these landforms and fragile plant communities that the Operator chose not to accept.

4.2.1.2.2. Cumulative Effects

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

4.2.1.2.3. Mitigation Measures

Impacts to ecological sites and vegetation from surface disturbance would be reduced through the implementation of the mitigation measures in Appendix D; COAs, Napier Road POD, and its associated plans including the Integrated Weed and Pest Management Plan, the WMP, and the MSUP (specifically Section 10, Plans for Reclamation of the Surface). Some of these documents are in the administrative record for the Napier Road POD at the BFO.

If applied correctly, BLM selected seed mixes which contain native grasses and forbs could restore disturbed areas to properly functioning vegetation communities with the exception of sage-brush since it's

not in the current seed mixes. BLM offers the same protections to privately owned surfaces as those administered by the BLM and therefore BLM developed a site specific seed mix for the Napier 2 well location and the access/pipeline corridors in the north half of Section 11 and south half of Section 2 T47N R75W. These mitigation measures will be applied to 1.5 miles or 7,920 feet of sandy ecological sites (Sandy 10-14NP) or shallow loamy (Shallow Loamy 10-14NP) which will require expedient reclamation. BLM can only require their use on BLM surface. The seed mix for private land is selected by the surface owner and may be more beneficial to cattle grazing.

The Operator will follow the reclamation requirements in Appendix C. See mitigation section in the soils section above for full description of the policy as it applies equally to ecological sites.

4.2.1.2.4. Residual Effects

Residual effects were also identified in the PRB FEIS, p. 4-408 such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

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

Lani CS Federal 1 and its associated access road would present a long term challenge for BLM and the operator to reclaim, and stabilize according to guidance provided in the Wyoming Reclamation Policy – particularly with the likely loss of biological soil crusts due to the proposed construction and maintenance required for the proposed well.

BLM developed a site specific sandy seed mix for the Napier 2 well location and the access/pipeline corridors in the north half of Section 11 and south half of Section 2 T47N R75W. BLM can only require their use on BLM surface. The seed mix selected on private land is selected by the surface owner and may be more beneficial to cattle grazing than it is to soil stabilization. The result may be long term wind and water erosion on the sandy soils with little or no re-vegetation success.

4.2.2. Wetlands/Riparian

4.2.2.1. Direct and Indirect Effects

The PRB FEIS identified direct and indirect effects to wet lands and riparian areas, p. 4-175. Additionally, the PRB FEIS identified effects to gallery forests of mature cottonwood trees (ROD, p. A-30). The Napier Road POD will use 2 water management strategies. Yates will manage produced water from the CBNG wells through a combination of the following: 1) containment within 12 on-channel reservoirs (See Chapter 4 Water Resources for explanation of primary and secondary reservoirs as not all 12 of the reservoirs are expected to be constructed), and 2) reinjection to the Fort Union formation using 3 deep injection disposal wells. A portion of the effluent will be discharged to the on-channel reservoirs via outfalls permitted through the Wyoming Pollutant Discharge Elimination System (WYPDES), administered by the WDEQ.

4.2.2.2. Cumulative Effects

The PRB FEIS adequately covered the potential cumulative effects to the wetland and riparian areas in Chapter 4, pp. 4-178 to 179.

4.2.2.3. Mitigation Measures

Mitigation measures that will help to protect the riparian and wetland habitat potentially affected by the activities described in this EA include, but are not limited to, the control of noxious weeds, adherence to the WYPDES permit requirements for the water quality and quantity monitoring of the discharges tied to this POD development, road crossing maintenance, and enforcement of the COA's and BMP's associated with this CBNG development.

4.2.2.4. Residual Effects

There will be changes to wetland and riparian areas through alterations in volume, velocity, timing, and quality of the stream flow due to direct discharge. Turbidity and solids loading in the streams would probably increase due to erosion of project disturbed areas and sediment transport to the associated drainages. These impacts would be mitigated by expediently stabilizing the disturbance and reducing the amount of sediment reaching the streams.

4.2.3. Invasive Species

4.2.3.1. 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.

4.2.3.2. Cumulative Effects

Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry 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 salt cedar, Canada thistle, and perennial pepperweed.

4.2.3.3. Mitigation Measures

BFO identified no additional mitigation measures.

4.2.3.4. Residual Effects

It is reasonable to limit the operator's control efforts 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 in the project area.

4.2.4. Wildlife

4.2.4.1. Habitat Types

4.2.4.1.1. Direct and Indirect Effects

The Napier Road project will result in direct loss of sagebrush shrublands. Fragmentation would increase, as measured by smaller and more frequent patches with an increased amount of edge. Fragmentation of habitats is one of the primary threats to wildlife (USFWS 2010, Nicholoff 2003, Hebblewhite 2008). Fragmentation of shrubsteppe habitat is a major disruption that has consequences for sagebrush-obligate species (Braun et al. 1976; Rotenberry & Wiens 1980). In fragmented habitats, suitable habitat area remains only as remnants surrounded by unusable environments (Urban and Shugart 1984; Fahrig and Paloheimo 1988).

When there is loss or fragmentation of sagebrush habitats, sagebrush-obligate species decline through several mechanisms: areas of suitable habitat decreases (Temple & Cary 1988), lower reproduction rates ensue, and/or higher mortality occurs in remaining habitats (Robinson 1992; Porneluzi et al. 1993). Density of sagebrush-obligate birds within 100 meters (328 ft) of roads constructed for natural gas development in Wyoming was 50% lower than at greater distances (Ingelfinger 2001). Fragmentation of shrubsteppe has the further potential to affect the conservation of sagebrush-obligate species because of the permanence of disturbance (Knick and Rotenberry 1995). Several decades are required to reestablish ecologically functioning, mature sagebrush communities. Thus sagebrush obligate species may not return for many years after completion of reclamation activities.

The development of the CBNG well pads will remove approximately 37 acres of sagebrush habitat. The associated access roads to the wells will remove approximately 18.5 acres. Seven cross-country utility pipelines will remove approximately 15.2 acres of sagebrush habitat. Twelve proposed water impoundments and associated access roads will remove approximately 60.7 acres of sagebrush habitat.

4.2.4.1.2. Cumulative Effects

Cumulative effects would include impacts associated with additional fee development and ongoing livestock grazing. Fee development in the vicinity would further exacerbate loss of sagebrush habitat through direct loss and effects of additional fragmentation and degradation of habitat quality. Appropriate levels of livestock grazing would not contribute to loss of sagebrush habitat, but inappropriate grazing can cause detrimental impacts to sagebrush habitats through alterations in understory communities, relative abundance of species, and changes in structure of the sagebrush canopy. Areas treated to eliminate sagebrush in order to favor herbaceous growth for livestock can result in direct loss of sagebrush habitat.

4.2.4.1.3. Mitigation Measures

BLM will consider expedient reclamation with appropriate seed mixes as a mitigation measure for habitat; in conjunction with BLM's consider of requesting a plan to stabilize topsoil within a 30-day period from the start of construction in those areas.

4.2.4.1.4. Residual Effects

The residual effect of diminished sage brush habitat will continue since by sage brush's very nature and the limits of modern plant science it may take years and even generations to promote sage brush re-population.

4.2.4.2. Threatened, Endangered, Proposed and Candidate Species

4.2.4.2.1. Threatened and Endangered Species

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

Common Name (scientific name)	Habitat	Project Effects	Rationale
Endangered			
Black-footed ferret	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NE	No suitable habitat present. 2011 USFWS block-cleared PRB for black-footed ferret.
Blowout penstemon	Sparsely vegetated, shifting sand dunes	NE	No suitable habitat present.
Threatened			
Ute ladies'-tresses orchid	Riparian areas with permanent water	NLAA	Suitable habitat present. No flowers observed during survey. Project more than 40 miles from known populations.
Candidate			
Greater Sage-grouse	Basin-prairie shrub, mountain-foothill shrub	MIIH	Sagebrush cover will be affected.

Project Effects
LAA - Likely to adversely affect
NE - No effect
NLAA - May effect, not likely to adversely affect individuals or habitat.
MIIH – May impact individuals and health

4.2.4.2.1.1. Black-Footed Ferret

4.2.4.2.1.1.1. Direct and Indirect Effects

The PRB FEIS discussed direct and indirect effects to black-footed ferret. Black-footed ferret habitat is

not present in the project area. Implementation of the proposed development will have "***no effect***" on black-footed ferret.

4.2.4.2.1.1.2. Cumulative Effects

The proposed project will have no effect on black-footed ferret populations.

4.2.4.2.1.1.3. Mitigation Measures

BFO proposes no mitigation measures.

4.2.4.2.1.1.4. Residual Effects

None identified.

4.2.4.2.1.2. Blowout penstemon

4.2.4.2.1.2.1. Direct and Indirect Effects

Suitable habitat is not present in the project area. Implementation of the proposed coal bed natural gas project will have "***no effect***" on blowout penstemon.

4.2.4.2.1.2.2. Cumulative Effects

The proposed project will have no effect on blowout penstemon.

4.2.4.2.1.2.3. Mitigation Measures

BFO proposes no mitigation measures.

4.2.4.2.1.2.4. Residual Effects

None identified.

4.2.4.2.1.3. Ute Ladies'-Tresses Orchid

4.2.4.2.1.3.1. Direct and Indirect Effects

Threats to the Ute ladies'-tresses orchid (ULT) in the PRB come from energy developments, noxious weeds, and water developments. Prolonged idle conditions in the absence of disturbance (flooding, grazing, mowing) may be a threat just as repeated mowing and grazing during flowering may lead to decline (Hazlett 1996, 1997, Heidel 2007). Heavy equipment used in energy development construction could dig up plants. Invasive weeds transplanted by vehicle and foot traffic in habitat could out-compete this fragile species.

Reservoir seepage may create suitable habitat if historically ephemeral drainages become perennial, however no historic seed source is known to occur within the project area. The proposed project is more than 40 miles from known populations. The survey observed no flowers during the flowering period. Implementation of the proposed CBNG project "***may effect, but is not likely to adversely effect***" ULT individuals or habitat.

4.2.4.2.1.3.2. Cumulative Effects

The proposed project "***may effect, but is not likely to adversely effect***" ULT individuals or habitat..

4.2.4.2.1.3.3. Mitigation Measures

No mitigation measures are proposed.

4.2.4.2.1.3.4. Residual Effects

None identified.

4.2.4.2.2. Candidate Species

4.2.4.2.2.1. Greater Sage-grouse

4.2.4.2.2.1.1. Direct and Indirect Effects

The, *12-Month Findings for Petitions to List the Greater Sage-Grouse (Centrocercus urophasianus) as Threatened or Endangered* (USFWS 2010) offers a detailed discussion of impacts to sage-grouse associated with energy development. The best available science describing both the range-wide and PRB current status, habitat needs, threats, and projections for the species can be found in the USFWS Proposed Rule (USFWS 2010). Of particular interest for the current status of greater sage-grouse as related to the project area are those sections of the Proposed Rule addressing habitat characteristics (p. 13917), connectivity (pp. 13923 to 41392), energy development (pp. 13942 to 13949), and projections of future populations (pp. 13958 to 13961). Impacts to sage-grouse are generally a result of loss and fragmentation of sagebrush habitats associated with roads and infrastructure. Research indicates that sage-grouse hens also avoid nesting in developed areas.

Implementation of the Napier Road project will adversely impact nesting and winter habitat through direct loss, fragmentation, and avoidance of habitats. The development of the CBNG well pads will remove approximately 5 acres of sage-grouse habitat. The associated access roads to the wells will remove approximately 18.5 acres of sage-grouse habitat. Seven cross-country utility pipelines will remove approximately 15.2 acres of sage-grouse habitat. Twelve water impoundments and associated access roads will remove approximately 60.7 acres of sage-grouse habitat. The existing road within 0.25 mile of the Kauffman Lek will receive additional traffic throughout the year to access portion of the Napier Road POD. The Napier Road POD area includes 3,303 acres of high quality nesting habitat and 4,989 acres of high quality winter habit (some of which overlap each habitat use).

During onsites, Yates' representative moved the following proposed well locations within the drilling window to reduce impacts to sagebrush obligate species. The following changes were made during the onsite process to reduce fragmentation of sage grouse habitats.

- Moved well #10 Waikiki 200ft toward an existing access road.
- Moved well #7 Waikiki near the #13 Waikiki Injection well and both wells will utilize one pad.
- Moved well #9 Waikiki back 300ft away from sage-grouse brood rearing habitat.
- Moved well #6 Waikiki back toward an existing access road.
- Moved injection well #7 Waikiki onto an existing plugged and abandoned well pad.
- Moved well #7 Niche 200ft back toward an existing access road.
- Moved the access road to the well # 3 Pine toward an existing overhead power line.
- Moved the access road to the well # 1Waikiki
- Moved well #2 Schofield 150ft toward a proposed impoundment.
- Moved well # 1 Napier 150ft toward an existing access road.
- Moved well #8 Niche 260 ft toward an existing access road.
- Moved well #9 Niche 100 ft toward an existing access road.

The occupied 38-Kauffman Draw lek is adjacent to, yet outside the POD boundary, and is the most productive lek within 4 miles of the project. While this POD has no direct effect on the lek grounds per se, BLM discloses that POD activities will have negative direct and indirect effects on the sage-grouse population that uses the lek through nesting habitat disturbances that are well documented to occur outside the immediate vicinity of the lek grounds; see below, and see the sage-grouse analysis in Yates' Veranda and Lazurite POD EAs, WY-070-09-039 and WY-070-09-095, respectively, which are incorporated here by reference.

BLM further recognizes the best sage-grouse science (as distilled in a maintenance action to the Buffalo RMP and expounded upon in WY Instruction Memorandum (IM) No. WY-2010-012), recognizes that

nesting sage-grouse avoid infrastructure by up to 0.6 miles and therefore a timing limitation attaches on all activities indentified nesting habitat within 2 miles of any occupied lek.[1] This affects the southern portion of the POD; see the sage-grouse mitigation map in the COAs.

4.2.4.2.2.1.2. Cumulative Effects

Recent research suggests that the cumulative and synergistic effects of current and foreseeable CBNG development in the vicinity of the project area and the impacts from West Nile virus on the birds are likely to impact the local sage-grouse population, cause declines in lek attendance, and may result in local extirpation. (Walker and Naugle 2011, Walker, et. al. 2007, and Zou 2006) The cumulative impact assessment area for this project encompasses the project area and the area that is encompassed by a 4 mile radius around the 4 sage-grouse leks that occur within 4 miles of the project boundary. Analysis of impacts up to 4 miles was recommended by the State Wildlife Agencies' Ad Hoc Committee for Consideration of Oil and Gas Development Effects to Nesting Habitat (2008).

Currently, there are 1,394 wells within the cumulative effects analysis area (208 sq mi), a well density of 6.7 wells per square mile. Excluding the Napier Road project, there are 691 proposed wells (Automated Fluid Minerals Support System (AFMSS), October 15, 2010) within the cumulative effects analysis area. The existing and proposed wells yield a well density increase of 10 wells per square mile. The addition of the wells from the Napier Road POD increases the well density to 10.3 wells per square mile.

The PRB FEIS (BLM 2003) reads 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 PRB or the entire range of the species is not likely to be compromised (p. 4-270)." [Emphasis added] Based on the impacts described in the PRB Oil and Gas Project FEIS and the findings of more recent research (see above citations), the proposed action may contribute to a decline in male attendance at the 8 leks that occur within 4 miles of this POD, and, potentially, extirpation of the local grouse population in those 8 leks.

4.2.4.2.2.1.3. Mitigation Measures

BFO will consider adoption of a conditions of approval that were incorporated into the BFO RMP as a maintenance action on September 17, 2010 resultant from the above IM. They read, "Disruptive activity is restricted on or within on quarter (0.25) mile radius of the perimeter of occupied or undetermined sage-grouse leks from 6 pm to 8 am from March 15-May 15;" and "Surface disturbing activities are prohibited from March 15 – June 30 in suitable sage-grouse nesting and early brood-rearing habitat within mapped habitat important for connectivity or within 2 miles of any occupied or undetermined sage-grouse lek." Additionally BFO recommends the application of other sage-grouse mitigation measures found in Appendix A of the 2003 ROD to this POD.

4.2.4.2.2.1.4. Residual Effects

A timing limitation does not mitigate loss and fragmentation of habitat or changes in disease mechanisms, nor does a timing limitation preclude maintenance activities (such as a work over rig, well enhancement, etc.) during breeding and nesting season. Suitability of the project area for sage-grouse will be negatively affected due to habitat loss and fragmentation and proximity of unrestricted human activities associated with CBNG operations and maintenance activities.

4.2.4.3. Sensitive Species

BLM will take necessary actions to meet the policies set forth in sensitive species policy (BLM Manual

[1] Some researchers found the best-fit spatial scale of impact from the lek 2 miles to over 8 miles, presumed as a function of the differing levels of oil and gas development in the analyzed region. (Harju, Walker, Holloran 2005)

6840). BLM Manual 6840.22A requires 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.

4.2.4.3.1. Bald Eagle

4.2.4.3.1.1. Direct and Indirect Effects

The presence of overhead power lines may impact foraging bald eagles. Bald eagles forage opportunistically throughout the PRB, particularly during the winter when migrant eagles join the small number of resident eagles. Power lines not built to Avian Power Line Interaction Committee (APLIC) standards pose an electrocution hazard for eagles and other raptors perching on them especially when overhead power is near roosting and nesting habitats. The USFWS developed additional specifications improving on the APLIC suggestions. Constructing power lines to the APLIC suggestions and USFWS standards minimizes but does not eliminate electrocution potential. The proposed Turtle Reservoir is under an existing overhead power line. A mid-span collision with the power line is likely to occur when eagles are flying over the open water.

Typically two-tracks and improved project roads pose minimal eagle and vehicle collision risk while moving vehicles travel the road. In one year of monitoring road-side carcasses the BLM BFO reported 439 carcasses, 226 along Interstates (51%), 193 along paved highways (44%), 19 along gravel county roads (4%), and one along an improved CBNG road (<1%) (Bills 2004). No road-killed eagles were reported. BFO observed eagles (bald and golden) feeding on 16 of the reported road-side carcasses (<4%). The risk of big-game vehicle-related mortality along CBNG project roads is so insignificant or discountable that when combined with the lack of bald eagle mortalities associated with highway foraging leads to the conclusion that CBNG project roads do not effect bald eagles.

Produced water will be potentially stored in up to 12 proposed reservoirs which may attract eagles if reliable prey is present, most likely in the form of waterfowl. The effect of the reservoirs on eagles is unknown. The reservoirs could prove to be a benefit (e.g. increased food supply) or an adverse effect (e.g. contaminants, proximity of power lines and/or roads to water). BFO will consider whether to require reporting of eagle use of reservoirs when or if any the Bureau receives a sundry to use the reservoirs for federal water in order to determine the need for any future management. Bald eagles are sensitive to human activities and tend to seek nesting and roosting areas away from human disturbance. See Section 4, Water Resources for explanation of primary and secondary reservoirs as not all 12 of the reservoirs are expected to be used for federal water.

BFO recommends that companies limit the construction of aboveground power lines near streams, water bodies, and wetlands to minimize the potential for eagles, raptors, or waterfowl colliding with power lines. PRB EIS ROD, p. A-10 #s 23, 27, and 37. BLM made the recommendation at the onsite to move the Turtle Reservoir, which is a non-bonded secondary reservoir, out from under the existing overhead power line or installing markers on the overhead power lines. Yates chose not to make the move or offer any additional mitigation measure to decrease the likelihood of eagles, raptors, and waterfowl colliding with the power lines. BFO will take this under consideration upon receipt of a sundry application to use federal water in this proposed reservoir.

4.2.4.3.1.2. Cumulative Effects

The PRB FEIS discusses impacts to sensitive bald eagles on pp. 4-251 to 4-253.

4.2.4.3.1.3. Mitigation Measures

There are no mitigation measures necessary at this time for secondary reservoirs.

4.2.4.3.1.4. Residual Effects

None identified.

4.2.4.3.2. Brewer's Sparrow

4.2.4.3.2.1. Direct and Indirect Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273. BFO expects the project impacts to Brewer's sparrow habitat to be similar to those described for and discussed in the greater sage-grouse section and the Loss or Degradation of Habitats and Habitat Fragmentation paragraphs for the sparrow is also a sage-brush obligate species.

4.2.4.3.2.2. Cumulative Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273.

4.2.4.3.2.3. Mitigation Measures

BFO recommends applying no further mitigation measures.

4.2.4.3.2.4. Residual Effects

None identified.

4.2.4.3.3. Ferruginous Hawk

4.2.4.3.3.1. Direct and Indirect Effects

The PRB FEIS discussed impacts to ferruginous hawks, p. 4-262. BFO provides updated information here.

The BLM must comply with the terms and conditions set forth in the Migratory Bird Treaty Act (MBTA) (1918), and the Bald and Golden Eagle Protection Act (1940) - both administered by the USFWS. The BLM is also required to comply with BLM MOU WO-230-2010-04, 50 CFR 22.

The USFWS Ecological Services Office issued recommendations for species specific spatial and seasonal buffers for breeding raptors in December 2009. That office recommends implementing a 1.0 mile -buffer around ferruginous hawk nests in which would ban long-term land-use activities.

BLM BFO coordinated with USFWS to receive site-specific recommendations, (see Section 2.4, Alternatives Considered but not Analyzed in Detail), for avoidance and minimization of impacts to ferruginous hawk nests and golden eagle nests located within and 0.5 mile from the Napier Road POD. See Appendix A, for the recommendations provided in a letter by USFWS dated October 25, 2010 (ES-61411/WY10CPA0202). The USFWS recommended relocating the following wells and infrastructure:

- Relocate 12 wells (Hamlet CS Federal Com #2, Mandarin CS Federal #6, Pineapple CS Federal #1, Pineapple CS Federal #4, Pineapple Injector Federal #6, Pineapple CS Federal #5, Mahalo CS Federal #3, Niche CS Federal Com #1, Niche CS Federal #8, Niche CS Federal #12, and Waikiki CS Federal #4) outside a 1.0 mile buffer from ferruginous hawk nests found near those wells.
- The Lani CS Federal #2 well be moved 0.5 mile away from nest #10279 (golden eagle nest) or for the well to be moved southeast (back) toward an existing overhead power line.
- Lani CS Federal #1 to moved away from nest #10279 (golden eagle nest) and on the other side of Napier Road; and

The USFWS strongly recommends:

- Moving the Turtle Reservoir 1.0 mile from nests #10297 and #10298.
- Moving Niche CS Federal Com #9 well outside of a 1.0 mile spatial buffer to protect the ferruginous hawk nest #8354).

The BLM considered the USFWS site specific recommendations, the PRB RMP and its ROD, the ESA and the Bureau's sensitive species policy, and the Operator's lease rights. The BLM did not carry these USFWS site specific recommendations forward in total as a viable alternative because: the 1 Pineapple, 4 Pineapple, 5 Pineapple, 6 Pineapple Injector, 1 Lani, 2 Lani, 1 Niche, and 4 Waikiki wells are not proposed within 1.0 mile of any ferruginous hawk nests or golden eagle nest that were active in the previous 3 years. This rule is in the Buffalo RMP. Recall that an active nest is "a nest that has been used once during the past three years" (RMP 1985, 2001, 2003). Additionally moving wells 1.0 mile from active ferruginous hawk nests moves the proposed wells outside of the Operator's lease rights; though biologically preferable and fully supportable given BLM's multiple use and conservation charters – is legally impracticable. However BLM found that the last 2 USFWS site-specific recommendations, above, had great merit within the project area.

Mitigation for potential impacts to ferruginous hawks can occur in at least two ways: 1) reduction of physical habitat disturbance by minimizing vertical and linear disruption and, 2) reducing human activity during breeding season. Minimizing physical intrusion can be done by reducing the overall amount of infrastructure within proximity of the nests, and by spatially arranging that infrastructure so as to create the least amount of visual disturbance to incubating adults while they are on a nest. This type of mitigation occurs during the planning phase, prior to construction. The intent of this type of mitigation is to preserve the physical integrity of the area such that the pair of ferruginous hawks will continue to select and occupy the breeding territory and produce young. Such mitigation may include removing infrastructure from an area and relocating infrastructure so that it is out of line-of-sight of nests during well maintenance activities (BLM 2010).

The intent of reducing human activity also addresses initial site selection; but, in addition, this type of mitigation may be necessary when physical disturbance is not reduced to an extent to avoid human activity altogether. This type of mitigation addresses potential impacts to adults once they initiated courtship in an area, indicating that the physical disturbance was designed adequately such that it did not cause avoidance. At this point, impacts on breeding activity may be caused by human activities associated with the new infrastructure. This type of mitigation reduces disturbance that may affect nest-related activities that start with maintenance of nests and continue on all the way through fledging and post-fledging activities in any given year (BLM 2010).

BLM ID Team determined the Niche CS Federal Com 9 was too close to (inside a biological buffer) the #8354 ferruginous nest even after the operator moved the well 100 feet away from the ferruginous hawk nest. Therefore, BLM suggested an alternate well location which would greatly reduce impacts to the breeding/nesting pair of ferruginous hawks. The BLM suggested well location moved the disruptive activities (described in the paragraphs above), across an existing disturbance (a county road), and down a hill, and approximately 160 feet further from Nest #8354 to reduce impacts and reduce the potential for an MBTA violation or a likely taking. BLM compared the Niche CS Federal Com 9 proposed well location to other wells which had similar issues relative to ferruginous hawk nests namely Beaver Creek Add II, Beaver Creek Add II SGP PODS approved 2009. Wells in these PODs were approved within 0.5 miles of active ferruginous hawk nests. BLM found this decision had several distinct differences. 1) To reduce impacts to ferruginous hawks from human activity associated with well maintenance, that operator committed to limit the number, length, and timing of well visitation throughout the life of the project, from drilling through production, 2) Beginning on February 1, annually, that operator will limit activities associated with the wells listed above by visiting them no more than once per week, limiting visits to

between 9 a.m. and 3 p.m., and keeping visits to no longer than 10 minutes. Because well visits usually occur twice per week, this will result in a 50% reduction in the amount of disturbance normally associated with well visitation. 3) That operator will also refrain from activities outside of normal well visitations that do not present a safety hazard at these well locations. These situations may include fixing a well pump, addressing subsidence, and well clean-outs. Limitation of activities will continue through July 31, annually, at all well locations within 0.5 miles of an active ferruginous hawk nest. 4) That operator also committed to an adaptive management strategy to evaluate the effectiveness of mitigation measures on an annual basis. 5) That operator and BLM will meet each year to determine how mitigation will be implemented in the following year based on the results of prior years. 6) That operator committed to using viewshed analyses, enhanced monitoring, and installation of artificial nest structures to contribute to researching the response of ferruginous hawks to development.

To reduce the risk of decreased productivity or nest failure, the PRB FEIS has a generic 0.5 mile radius timing limitation during the breeding season around active raptor nests of any species. Once wells are in the production phase, timing stipulations only apply to surface disturbing activities and will not adequately protect nesting/breeding raptors during maintenance activities which may take up to days to complete unlike what was written in the 2003 FEIS, p. 4-218, under *Harassment and Displacement* reads, "Construction may result in displacement from affected habitats during the entire construction phase (a time frame of weeks to months), while production would result in displacement only during well visits (a time frame of hours)." The second paragraphs continues; "Timing stipulations would not allow new disturbance during the breeding season within species-specific distances of active nest." Maintenance activity will allow new disturbance during nest/breeding season (multiple days of semi trucks on location, a back hoe to dig a pit, a drill rig erected (above 30 feet), and multiple people at the location). The proposed project will impact the following nests (also noted in Appendix B) given the above best science.

Table 4.3. Active Ferruginous Hawk Nests within 0.5 mile of Proposed Wells and Infrastructure

Nest #	Well #	Infrastructure
2531	10 Niche-Com, 11Niche,12 Niche, and 11 Mahalo-Com	Access Road, Buried Utility
8354	9 Niche,11 Niche,12 Niche	Power Drop, Access Road, Buried Utility
10288	2 Hamlet-Com	Access Road
4095	6 Mandarin well	none
4596	none	Buried Utility Corridor
6355	6 Mandarin well	none

Nest #2531 is 1 of 3 ferruginous hawk nests within an active territory. The nest was active, then it failed, in 2010. Portions of Napier Road are visible from the nest. The proposed access road to the 11 Niche and 12 Niche wells is northwest and out of line of sight from the nest. The 1 Mahalo Com well is proposed within 0.35 mile of nest #2531, and out of line of sight of the nest, as well as tucked into which provides an adequate spatial and topographic buffer of this well in relation to the nest.

Nest #8354 was active in 2009. It is a ground nest found approximately 0.13 mile (686 feet) from and is situated below the proposed Niche CS Federal Com 9 well. The nest is in excellent condition. Napier Road and the traffic associated with it are visible for about 60 feet from the nest. Napier Road runs along the top of a ridge and receives daily traffic. The Operator proposes overhead power lines directly over the

nest that would serve the Napier Road POD. The BLM wildlife biologist strongly encouraged the Operator to move the well to the other side of Napier Road to give the nesting pair an adequate biological buffer to preclude a very likely taking.
During the onsite the proposed well location was moved 100 feet (of a possible 656 feet (200 meters) west from its original location toward the edge of the drilling window (toward Napier Road), but an inadequate distance from this nest to avoid disruptive activities that will impact breeding/nesting pairs of ferruginous hawks. Such activities include: noise, out of vehicle activities from well operations, additional traffic, human and equipment disruption associated with maintenance activities (workover/drilling rig, frac-tanks, water trucks, multiple large vehicles on the well pad at one time) occurring throughout the year. Out-of-vehicle activities are generally considered more disturbing to raptors than in-vehicle activities (French 1972, Garber 1972, Kahl, 1972, Shagen 1980, Fraser et al. 1985, Holmes et al. 1993). Stopped vehicles, particularly when occupants leave the vehicle, provoke negative responses from nesting or perching raptors more often than moving vehicles (Steenhof 1076, Beck 1980, Scott 1985, White and Thurow 1985). Allowing a well location to remain in such close proximity to this nest (686 feet) also increases the potential for nest predation - as well houses create ideal denning locations for most mammalian predators as witnessed throughout the PRB by BLM employees during field inspections. Though this is a concern for raptor nesting in general, predation potential is of heightened concern for ground nest builders such as ferruginous hawks.

The proposed access road to the 11 Niche and 12 Niche wells will pass within 0.16 miles (850 feet) south and in line of sight of nest #8354. The traffic that will occur on this access road during the breeding season will likely impact the nesting pairs' foraging opportunities and will detrimentally impact fledging.

The 10 Niche well is also proposed within 0.5 mile (2,640 feet) of nest #8354. The well is 0.36 mile, 1900 feet away, out of line of sight, and separated from the nest by Napier Road, all of which provide an adequate topographic buffer (being on the opposite side of ridge from Napier Road).

Nest #10288 was active in 2010 and has a history of use. The proposed location for the 2 Hamlet well is approximately 0.17 miles (898 feet) west and in-line of sight of the nest. A moving pump jack from an oil well is visible from the nest at approximately 300 feet.

Nest #4095 reported gone in 2010.

Nest #4596 reported gone in 2010.

Nest #6355 is located approximately 0.5 miles south and out of line of sight from the 6 Mandarin well. An existing overhead powerline is within 100ft of the nest. Also, an existing two-track is located approximately 0.35 miles north of the nest. It is more than likely that the nesting pair will not be impacted by the development of the 6 Mandarin well because of the topography and distance between the nest and the proposed well location.

Inactive Nests #s 10299, 10300, and 10303 received surveys for 2 years. All nests where inactive during the surveys. All 3 nests are in line of sight of the #6 Mandarin well. It is unlikely that nesting will occur in the future with the approval of the well.

Inactive Nest #10294 only received surveys for 2 years. The nest was inactive during the surveys. Yates did move the #1 Pineapple well approximately 300 feet away from the nest; however the well is still within line of sight of the nest. It is likely that a nesting pair will no longer use the nest in the future with the approval of the well.

Five other inactive ferruginous hawk nests located within the territory (#s 4091, 5873, 5874, 5875, and

6357), are within 0.7 mile of the proposed well location. These 5 nests cluster together within 0.25 miles of each other, suggesting a territory, however nest #10288 is more than 0.25 miles from (south side of Napier Road) the cluster of nests which is in a separate territory. The Operator rejected the wildlife biologists' recommendation of relocating the proposed 2 Hamlet well out of line of sight of the nest because the proposed well is on an existing plugged and abandoned well location.

4.2.4.3.3.2. Cumulative Effects

For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, p. 4-221. See also the Raptor Section under Alternative B of this EA. Existing and reasonably foreseeable CBNG development in the PBR would affect the ferruginous hawk population due to an increased human activity and maintenance activity occurring near nesting habitat during the production phase of CBNG wells.

4.2.4.3.3.3. Mitigation Measures

BLM will consider applying the following COA to active nests:

No surface disturbing activity shall occur within 0.5 mile of all identified (inside of round buffers, see map in the COAs) raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation will affect the wells and infrastructure depicted in the COA raptor map.

The BFO BLM wildlife biologist's recommendations:
BLM demonstrates that impacts to ferruginous hawk nesting habitat can be mitigated by alteration of operator practices, thereby making locations such as the Napier Road Niche CS Federal Com 9 well approvable. See Beaver Creek Add II, Add II SGP, and Little Buffalo 32-24 & 34-24, EA # WY-070-09-065, p. 10, para. 1-3. The BLM biologist proposed the same mitigation, moving the well, which was committed to in the project analyzed in EA WY-070-EA09-065 to preclude a very likely taking. Yates was unwilling to make a similar commitment to include moving the well 200 meters (686 feet), per 43 CFR 3101.1-2. (See correspondence section of the administrative record in project file.) Therefore in the absence of moving the proposed well to achieve an adequate biological buffer from the active nest (distance, line of sight, reduced apparent disturbance – the BLM will consider denying the Niche CS Federal Com 9 APD.

4.2.4.3.3.4. Residual Effects

Construction and maintenance activity in the production phase of the proposed Niche CS Federal Com 9, at its proposed site with inadequate biological spatial buffers during the breeding, nesting, and fledging seasons will have an adverse impact that most likely will rise to a taking of active nest #8354. The BLM will consider the strong recommendation from the USFWS, whether approval of Niche CS Federal Com 9 APD at Yates' proposed location causes the BLM to fall outside the parameters of the BLM Sensitive Species policy and governing directives, and the inadequate well move proposed by the Operator that did not mitigate the spatial boundary issue, and the Operator's rejection of the alternative well site proposed by BLM that comported to 43 CFR 3101.1-2.

BLM is concerned about the impacts that the proposed development near active ferruginous hawks nests may have on the future breeding behavior of ferruginous hawks that have nested in proximity of these areas in the past. The BLM BFO wildlife biologist is greatly concerned about the proposed well locations within the biological buffers of known active ferruginous hawk nests in which Yates accepted no additional mitigations measures. Timing stipulations only apply to surface disturbing activities and will not adequately protect nesting/breeding raptors during maintenance activities which may take up to days to complete unlike what was written in the 2003 FEIS, p. 4-218 under *Harassment and Displacement* reads, "Construction may result in displacement from affected habitats during the entire construction

phase (a time frame of weeks to months), while production would result in displacement only during well visits (a time frame of hours)."

The Buffalo RMP does not provide protections to inactive nests, with inactivity defined as 3 years without nesting activity. The BFO collected field office area raptor data since completion of the 2003 PRB FEIS ROD. In an evaluation of a sample data-set about 14% of the known ferruginous hawk nests would not be protected by applying the 3-year inactivity rule. For ferruginous hawks, which use multiple nests over multiple years, the period between activities for any given nest should be longer. Nests that were inactive in the past 3 years will more than likely not become active again in the future by permitting a CBNG well within the biological buffer of inactive nest.

4.2.4.3.4. Loggerhead Shrike

4.2.4.3.4.1. Direct and Indirect Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273. Expected project impacts to loggerhead shrike habitat are expected similar to those described for and discussed in the greater sage-grouse and the Loss or Degradation of Habitats and Habitat Fragmentation paragraphs, for the shrike is also a sage-brush obligate species.

4.2.4.3.4.2. Cumulative Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273.

4.2.4.3.4.3. Mitigation Measures

No further mitigation measure applied.

4.2.4.3.4.4. Residual Effects

None identified.

4.2.4.3.4.5. Mountain Plover

4.2.4.3.4.5.1. Direct and Indirect Effects

The PRB FEIS discussed impacts to mountain plover, pp. 4-254 to 4-255. See black-tailed prairie dog section for site specific direct and indirect effects to mountain plover habitat. In addition to impacts discussed in the PRB FEIS, mineral development has mixed effects on mountain plovers. Disturbed ground, such as buried pipeline corridors and roads, may provide suitable nesting habitat for mountain plovers. On the other hand, increased traffic, construction, and human activities within 0.25 mile may be disruptive to nesting.

4.2.4.3.4.5.2. Cumulative Effects

The PRB FEIS discussed cumulative impacts to mountain plovers.

4.2.4.3.4.5.3. Mitigation Measures

BLM recommends the application of the programmatic mitigation measures found in the PRB ROD, p. A-35 to A-37 to reduce impacts to nesting mountain plovers. This includes, but is not limited to, that a disturbance free buffer zone of 0.25 mile will be established around all mountain plover nesting locations between March 15 and July 31.

4.2.4.3.4.5.4. Residual Effects

Even with timing limitations on surface-disturbing activities, mountain plovers may be displaced by other activities associated with development. Traffic and construction activities that are not prohibited by the timing limitations may degrade habitat quality sufficiently to render the area unsuitable for some mountain plovers. BLM discloses that timing limitations do not mitigate habitat loss, therefore drilling and construction that takes place outside of nesting season will still likely result in habitat loss for this

species. The timing limitation will result in some decrease in direct mortalities that would occur with increased drilling traffic during the breeding season. Mortalities associated with maintenance and non-surface-disturbing activities will still occur.

4.2.4.3.5. Sage Sparrow

4.2.4.3.5.1. Direct and Indirect Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273. Expected project impacts to sage sparrow habitat are expected to be similar to those described for and discussed in the greater sage-grouse section and the Loss or Degradation of Habitats and Habitat Fragmentation paragraphs for the sparrow is also a sage-brush obligate species.

4.2.4.3.5.2. Cumulative Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273.

4.2.4.3.5.3. Mitigation Measures

No further mitigation measure applied.

4.2.4.3.5.4. Residual Effects

None identified.

4.2.4.3.6. Sage Thrasher

4.2.4.3.6.1. Direct and Indirect Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273. Expected project impacts to sage thrasher habitat are expected to be similar to those described for and discussed in the greater sage-grouse section and the Loss or Degradation of Habitats and Habitat Fragmentation paragraphs for the sage thrasher is also a sage-brush obligate species.

4.2.4.3.6.2. Cumulative Effects

The PRB FEIS discusses impacts to sensitive species on pp. 4-257 to 4-273.

4.2.4.3.6.3. Mitigation Measures

No further mitigation measure applied.

4.2.4.3.6.4. Residual Effects

None identified.

4.2.4.3.7. Western Burrowing Owl

4.2.4.3.7.1. Direct and Indirect Effects

The PRB FEIS discussed impacts to burrowing owls on p. 4-263. Nest #5865 is an inactive burrowing owl nest located along an existing two-track. Three wells (5 Mahalo, 6 Mahalo, and 7 Mahalo-inject), and 0.23 miles of buried utility pipeline will also be built within the 0.25 miles buffer of this nest. Annual surveys should continue for nest activity. If the nest should become active then mitigation measures will apply (please see mitigation section below) to reduce impacts toward the breeding/nesting pair of burrowing owls.

4.2.4.3.7.2. Cumulative Effects

In addition to the federal development, there will be fee development associated with the project that will have similar impacts on burrowing owls as those discussed in the PRB FEIS. Practices such as poisoning or shooting of prairie dogs or other intentional methods of extermination in order to increase forage for livestock can potentially affect burrowing owl productivity through a reduction in nest site availability.

4.2.4.3.7.3. Mitigation Measures

BLM will consider application of the standard programmatic survey mitigation measure for nest #5865, per the PRB ROD, p. A-34, para. A.5.11.1 in the event it is found active. If nest #5865, or any other burrowing owl nest is found in the POD, then the BLM recommends the following mitigation measure as the least restrictive measure. The Thunder Basin National Grassland (TBNG) which is partially in Campbell County, WY, cooperated with the BLM in the creation of the 2003 PRB FEIS. TBNG recommends a 0.25 mile timing restriction buffer zone for burrowing nest locations during their nesting season (April 15 to August 31). BLM WO Instruction Memorandum No. 2006-197, directs the field offices to "use the least restrictive stipulations that effectively accomplish the resource objectives or uses." BFO alters its general raptor nest timing limitation (February 1 to July 31) to a more specific burrowing owl nesting season timing limitation that effectively reduces the vulnerability of owls to collision while shortening the timing restriction period to 4 1/2 months (see Section 3 for breeding, nesting, and migration chronology), from 6 1/2 months and from 0.5 mile to 0.25 mile. BLM recommends a survey to be conducted during breeding season and if the nest is active then a timing limitation (April 15 to August 31) will be applied to nest #5865.

4.2.4.3.7.4. Residual Effects

The timing limitation will not mitigate loss of nesting habitat. Wells, pipelines, and roads that are built in prairie dog colonies will directly impact nesting habitat and may reduce the quality of adjacent habitats for burrowing owls, regardless of the timing of their construction. Nor does a timing limitation preclude maintenance activities (work over rig, well enhancement, etc) during breeding and nesting season. Suitability of the project area for burrowing owls will be negatively affected due to habitat loss and fragmentation and proximity of unrestricted human activities associated with CBNG operations and maintenance activities.

4.2.4.3.8. Black-tailed Prairie Dog

4.2.4.3.8.1. Direct and Indirect Effects

Within the Napier Road POD, there is an inactive prairie dog colony located in S7 T47N R75W. Within the perimeter of that prairie dog colony 3 wells (Mahalo CS Federal 5, Mahalo CS Federal 6, and Mahalo Injector Federal 7) are proposed; 0.5 miles of an existing two-track is proposed to be upgraded into an access road into the before mentioned 3 wells, approximately 400 feet of a buried utility pipeline is proposed to be trenched through the colony. No impacts are anticipated to the remaining two prairie dog colonies.

4.2.4.3.8.2. Cumulative Effects

The PRB FEIS discussed the cumulative effects for black-tailed prairie dogs associated with circumstances similar with those in Alternative B, (pp. 4-255 to 4-256).

4.2.4.3.8.3. Mitigation Measures

No mitigation measures are required.

4.2.4.3.8.4. Residual Effects

No residual impacts are anticipated if overhead power is not built within active prairie dog colonies

4.2.4.3.9. Swift Fox

4.2.4.3.9.1. Direct and Indirect Effects

The project will impact swift fox habitat. The construction of well pads, roads, and pipelines in and adjacent to prairie dog colonies and grasslands will cause direct habitat loss. During construction of these facilities, there is the possibility that swift foxes may be killed as a direct result of the earth moving equipment. Constant noise and movement of equipment and the destruction of burrows puts considerable stress on the animals and is likely to cause an increase in swift fox mortalities. Individuals are exposed

more frequently to predators and have less protective cover. Mineral related traffic on the adjacent roads may result in swift fox road mortalities. Additional impacts to swift fox are discussed in the PRB FEIS on p. 4-265.

4.2.4.3.9.2. Cumulative Effects

In addition to the federal development, there is existing fee development associated with the project that will have similar impacts on swift fox. Activities associated with livestock grazing may harass or disturb swift fox, but these activities are often transient in nature and occur at low enough frequencies that disturbance will be minimal. Practices such as poisoning or shooting of prairie dogs or other intentional methods of extermination in order to increase forage for livestock can potentially affect swift fox through a reduction in prey availability.

4.2.4.3.9.3. Mitigation Measures

The PRB FEIS produced a sensitive species mitigation measure requiring clearance surveys for sensitive species at appropriate times (see FEIS ROD, A.5.11.1, p. A-34). The Thunder Basin National Grasslands (TBNG) in Campbell County, WY, cooperated with the BLM in the creation of the 2003 PRB EIS and applied a standard condition to oil and gas activities in association with swift fox dens. Therefore, in order to protect the species, the BLM BFO incorporated the following condition from the TBNG Land Resource Management Plan in order to implement the PRB FEIS ROD, A.5.11.1, programmatic mitigation. “To reduce disturbances to swift fox during the breeding and whelping seasons, prohibit the following activities within 0.25 miles of their dens from March 1 to August 31: Construction (e.g. roads, water impoundments, oil and gas facilities), reclamation, gravel mining operations, drilling of water wells, and oil and gas drilling.” This timing restriction, based on the best available science and coordination with the Operator, will reduce direct impacts to swift foxes within the project area during the pupping season. Additional site-specific methods and procedures were analyzed, such as habitat protection without surveys for the animal and track-plate survey methodology (Dark-Smiley and Keinath 2003). However, after coordination with the Operator, the above condition of approval was agreed upon to provide for protection of swift fox during their most vulnerable time (pupping), while providing the least restrictive conditions possible to meet the conservation objectives.

4.2.4.3.9.4. Residual Effects

BLM discloses that timing limitation will not mitigate habitat loss. Swift fox dens and prey availability will be impacted through loss of prairie dog colonies, despite the restriction on the timing of construction.

4.2.4.4. Big Game

4.2.4.4.1. Direct and Indirect Effects

BLM discloses that yearlong range for pronghorn and yearlong and winter yearlong range for mule deer would be directly disturbed with the construction of wells, pipelines and roads. Table 4.1 summarizes the proposed activities. Items identified as long term disturbance would cause direct habitat loss. Short-term disturbances also result in direct habitat loss; however, they may provide some habitat value as they are reclaimed, and native vegetation becomes established.

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

Big game animals are expected to return to the project area following construction; however, populations

will likely be reduced lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and, as the Pinedale Anticline study suggests, mule deer do not readily habituate. A study in North Dakota stated, "Although the population (mule deer) had over seven years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long term and chronic" (Lustig 2003). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

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

Reclamation activities that occur within big game habitats during the spring will likely displace does and fawns due to the human presence in the area. This may cause reduced survival rate of does and fawns that must expend increased energies to avoid such activities.

4.2.4.4.2. 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, pp. 4-181 to 4-215.

4.2.4.4.3. Mitigation Measures

BLM recommends no further mitigation measures.

4.2.4.4.4. Residual Impacts

While big game animals are expected to return to the project area following construction, likely in reduced numbers, the 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.

4.2.4.5. Aquatics

4.2.4.5.1. Direct and Indirect Effects

Some of the produced water from the Napier Road POD will be injected back into an aquifer. The remaining water will be stored in impoundments for livestock use. If a reservoir were to discharge, it is unlikely that the produced water would reach a fish-bearing stream or that downstream species would be affected.

The WDEQ regulates effluent discharge through the Wyoming Pollution Discharge Elimination System in compliance with the Federal Water Pollution Control Act and the Wyoming Environmental Quality Act. The WDEQ has established effluent limits for the protection of game and non-game, aquatic life other than fish, wildlife, and other water uses.

4.2.4.5.2. Cumulative Effects

The cumulative effects associated with Alternative B are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts refer to the PRB FEIS, (pp. 4-247 to 4-249).

4.2.4.5.3. Mitigation Measures

No mitigation measures are required.

4.2.4.5.4. Residual Impacts

None identified.

4.2.4.6. Migratory Birds

4.2.4.6.1. Direct and Indirect Effects

Direct and indirect effects to migratory birds are discussed in the PRB FEIS (pp. 4-231 to 4-235).

Stock water tanks will be constructed at each water impoundment proposed within the Napier Road POD. Some migratory birds will more than likely drown in stock water tanks if a bird escape ramp is not installed. Migratory birds drowning in a stock water tanks that receives water from the Napier Road wells will have the operator in violation of MBTA.

Disturbance of habitat within the project area is likely to impact migratory birds. Native habitats will be lost directly with the construction of wells, roads, and pipelines. Reclamation and other activities that occur in the spring may be detrimental to migratory bird survival. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Activities will likely displace migratory birds farther than the immediate area of physical disturbance. Drilling and construction noise can be troublesome for songbirds by interfering with the males' ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003).

Habitat fragmentation will result in more than just a quantitative loss in the total area of habitat available; the remaining habitat area will also be qualitatively altered (Temple and Wilcox 1986). Ingelfinger (2004) identified that the density of breeding Brewer's sparrows declined by 36% and breeding sage sparrows declined by 57% within 100 m (328 feet) of dirt roads within a natural gas field. Effects occurred along roads with light traffic volume (<12 vehicles per day). The increasing density of roads constructed in developing natural gas fields exacerbated the problem creating substantial areas of impact where indirect habitat losses through displacement were much greater than the direct physical habitat losses.

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

Migratory bird species within the PRB 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. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable.

Overhead power lines may affect migratory birds in several ways. Power poles provide raptors with perch sites and may increase predation on migratory birds. Power lines placed in flight corridors may result in collision mortalities. Some species may avoid suitable habitat near power lines in an effort to avoid predation.

Placement of Turtle Reservoir beneath overhead power (OHP) presents an attractant for waterfowl use and increases the risk of collisions with OHP; BLM identified this particular problem at the onsite in the

presence of Yates company personnel. Yates offered no mitigation measures to reduce the risk of waterfowl collisions.

4.2.4.6.2. Cumulative Effects

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

4.2.4.6.3. Mitigation Measures

Where sage-grouse or raptor nesting timing limitations are applied, nesting migratory birds will also receive protection. A COA requiring all stock tanks include effective wildlife escape devices will reduce potential bird mortality from drowning. No additional mitigation measures are required.

Yates proposes building the Turtle Reservoir under an existing 3-phase OHP. This site will increase the risk of bird collisions and mortality. Mitigation measures defined in the PBR 2003 ROD, p. A-10, #27 reads; "The companies will limit the construction of above ground power lines near streams, water bodies, and wetlands to minimize the potential for waterfowl colliding with power poles." BLM will take this under consideration in the event the Operator requests a sundry and posts bond for this reservoir.

4.2.4.6.4. Residual Effects

Those species and individuals that are nesting in areas unprotected by sage-grouse timing limitations or raptor timing limitations may have nests destroyed, or be disturbed, by construction activities. This is also the case for migratory birds that are still nesting after sage-grouse timing limitations are over (after 30 June). Protections around active raptor nests (Feb 1- July 31) extend past most migratory bird nesting seasons, but only a small portion of known nests are active in any given year, so the protections for migratory birds from June 30 - July 31 will only be in place for those that are nesting within 0.5 miles of that small portion of active nests.

4.2.4.7. Raptors

4.2.4.7.1. Direct and Indirect Effects

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

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.

OHP lines may affect raptors. Power lines placed in flight corridors may result in collision mortalities. Some species may avoid suitable habitat near power lines in an effort to avoid predation. For further impacts on raptors from OHP, see the above section on bald eagle direct and indirect effects.

<u>Power drop moves made</u>: Locations of power drops become potential locations for generators and generators create concerns with increased average daily traffic(ADT)/ frequent refueling of 500 gallon fuel storage tanks on location (up to 3 times a week), potential irrecoverable diesel spills into drainages and a dramatic increase in steady noise. It is important to locate these power drops in locations which will reduce impacts to drainages, roads, and wildlife. BLM and Yates worked together to reduce impacts to raptor nests by relocating the following power drops locations, (see deficiency letter dated September 24, 2010 and Map D dated December 14 2010:

1. Power drop for Niche 9, Niche 11 and Niche 12 is relocated to the east side of Napier Road.
2. Power drop for Mahalo 1, Mahalo 2 and Mahalo 4 is relocated to the west side of Napier Road.
3. Power drop for Hamlet 2 and Napier 1 is relocated next to Napier Road.
4. Power drop for Mandarin 3 and Pineapple 1 is relocated next to intersection of Pineapple 1.
5. Power drop for Waikiki 10 and Waikiki 11 is relocated back to intersection.
6. Power drop for Waikiki 2 is relocated north of Waikiki 2 under over head power.
7. Power drop for Niche 4, Niche 5, and Niche 6 is relocated on the north side of Napier Road.

4.2.4.7.2. Cumulative Effects

The PRB FEIS analyzed the cumulative effects associated with raptors, p. 4-221.

4.2.4.7.3. Mitigation Measures

To reduce the risk of decreased productivity or nest failure (PRB FEIS, p. 4-218), the PRB FEIS analyzed a 0.5 mile radius timing limitation during the breeding season around active raptor nests. In order to further understand the degree of potential population effects to raptor species (PRB FEIS, p. 4-219 to 4-220), BLM recommends that annual surveys for new raptor nests and nest occupancy checks shall be completed, see also PRB 2003 ROD, A-12, #38.

4.2.4.7.4. Residual Impacts

The timing restrictions analyzed in the PRB ROD can only be applied to surface disturbing activities. These restrictions do not protect nesting raptors from human disturbance or maintenance actions (disruptive activity that can last from several days to weeks) associated with later phases of CBNG operations at well locations during breeding/nesting season. Impacts associated with noise, additional traffic, human presence, and equipment disruption associated with maintenance actions from well operations remain.

4.2.5. Water Resources

The operator 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 Napier Road POD will use 2 water management (WMP) strategies. Produced water from the CBNG wells will be managed through a combination of the following: 1) containment within 12 on-channel reservoirs (2 primary, 10 secondary), and 2) reinjection to the Fort Union at 4,600 feet below surface formation using 3 deep injection disposal wells. A portion of the effluent will be discharged to the on-channel reservoirs via outfalls permitted through the WYPDES, administered by the WDEQ. (See WYPDES Permit WY0056782.)

The maximum water production is predicted to be 52.0 gpm per well or 2600 gpm (5.79 cubic feet per second (cfs) or 4193 acre-feet per year) for this POD. The PRB FEIS projected the total amount of water that anticipated from CBNG development per year, (Table 2-8, Projected Amount of Water Produced from CBM Wells under Alternatives 1, 2A, and 2B p. 2-26). For the Upper Powder River drainage, the projected volume produced within the watershed area was 44,169 acre-feet in 2011 (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 9.4% of the total volume projected for 2011. This volume of produced water is within the predicted parameters of the PRB FEIS.

4.2.5.1. Groundwater

4.2.5.1.1. Direct and Indirect Effects

The PRB FEIS predicts an infiltration rate of 40% to groundwater aquifers and coal zones in the Upper Powder River drainage area (PRB FEIS, p. 4-5). For this action it may be assumed that a maximum of 1040 gpm will infiltrate at or near the discharge points and impoundments (1677 acre feet per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater 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, p. 4-54) Therefore, the chemical nature and the volume of the discharged water may not degrade the groundwater quality.

The PRB FEIS predicts that one of the environmental consequences of CBNG production is possible impacts to the groundwater. "The effects of development of CB[NG] 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, p. 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 permitted CBNG wells produce from depths which range from 1,500 to 1,800 feet compared to 120 and 589 feet deep Wasatch sands in the water wells. The operator committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence (0.5 mile of a federal CBNG producing well) of the proposed wells.

The PRB FEIS anticipated that recovery of the coal bed aquifer should ". . . 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 [found in 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, p. 4-38)

4.2.5.1.2. 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, p. 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, p. 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, p. 4-65)

4.2.5.1.3. 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 using 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.

The Wyoming DEQ developed a guidance document to address the potential impacts from infiltration on shallow ground water, "Compliance Monitoring and Siting Requirements for Unlined Impoundments Receiving Coalbed Methane Produced Water" (November, 2008). For all new WYPDES permits, the

WDEQ requires that the proponent investigate the shallow groundwater at the proposed impoundment locations. Drilling at proposed impoundments began in the spring of 2004. Based on information received from the WDEQ, as of December, 2010, over 2016 impoundment sites were investigated with more than 2305 borings. Of these impoundments, 257 met the criteria to require "compliance monitoring" if constructed and used for CBNG water containment. Only 132 impoundments requiring monitoring are presently used. As of the fourth quarter of 2010 only 24 of those monitored impoundments (13.6%), caused a change in the "Class of Use" of any parameter in the underlying aquifer water.

4.2.5.1.4. Residual Effects

As described in Section 3.4.1, the production of CBNG in this project area may cause groundwater levels to drop due to the CBNG dewatering. The PRB FEIS analyzed groundwater recharge post-CBNG development. An estimated 40 percent of the groundwater removed would infiltrate the surface and recharge the shallow aquifers above the coal, PRB FEIS, p. 4-68.

4.2.5.2. Surface Water

4.2.5.2.1. 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 detailed in the project area WYPDES permit, and the concentrations found in the POD's representative water sample.

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

Sample location or Standard	TDS mg/l	SAR	EC µmhos/cm
Primary Watershed at Arvada, WY Gauging Station Historic Data Average at Maximum Flow Historic Data Average at Minimum Flow		 4.76 7.83	 1,797 3,400
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8) Drinking Water (Class I) Agricultural Use (Class II) Livestock Use (Class III)	 500 2,000 5,000	 8	
WDEQ Water Quality Requirement for WYPDES Permit #WY0056782 At discharge point At Irrigation Monitoring point (IMP1-IMP9)	 2,000 NR*	 AC* <7.10 x EC-2.48	 NR*
Predicted Produced Water Quality Coal Zone (Big George)	 1,080	 14.5	 1,750

AC* = Assimilative Capacity Requirements
NR* = Not Reported

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the PRB is the irrigation of crops, p. 4-69). However, irrigation use is not proposed in the WMP, rather the water will be stored in on channel reservoirs or disposed of in deep injection wells.

The water quality projected for this POD is 1,080 mg/l TDS. 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 52.0 gallons per minute (gpm) is projected is to be produced from these 50 wells, for a total of 2,600 gpm for the POD.

The proposed method for surface discharge provides passive treatment through the aeration supplied by the energy dissipation configuration at each discharge point outfall. Aeration adds dissolved oxygen to the produced water which can oxidize susceptible ions, which may then precipitate. This is particularly true for dissolved iron. Because iron is one of the key parameters for monitoring water quality, the precipitation of iron oxide near the discharge point will improve water quality at downstream locations.

The operator obtained a WYPDES permit for the discharge of water produced from this project from the WDEQ. Permit effluent limits were set at (WYPDES Permit WY0056782, p. 2):

pH	6.5 to 9.0
Specific Conductance	5,075 µmhos/cm max
Dissolved Iron	1000 µg/l max
Total Barium	1800 µg/l max
Total Arsenic	8.4 µg/l max
Chlorides	150 mg/l

The WYPDES permit also addresses existing downstream concerns, such as irrigation use, in the COA for the permit. The 9 designated points of compliance identified for this permit are shown in WMP WYPDES Permit Number WY0056782, Table 1, pp. 13-14.

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 committed to designate a reference well to each coal zone within the POD boundary. BLM will consider having sample the reference well at the wellhead for analysis within 60 days of initial production and submit a copy of the water analysis to the BLM Authorized Officer. For more information refer to this POD's WMP.

Produced Water Control

Management of produced water: 3 injections wells will be drilled via re-entry into the well bore on P&A well locations, 2 primary impoundments (Firecracker and Nobama) associated with the proposed injection wells will be built during the time the injection wells are completed. Ten remaining impoundments would potentially be built in the project area. If all 12 impoundments are constructed, these impoundments will disturb approximately 60.7 acres, including the dam structures, and have the ability to store 503.9 acre feet of produced water. Twelve half-tire stock tanks and aeration outfalls connected to the reservoirs disturb approximately 1.2 acre. All 12 water impoundments would be on-channel reservoirs. The on-channel impoundments would result in evaporation and infiltration of CBNG water.

The primary reservoirs associated with the proposed injection wells provide 2 main functions in the water management strategy.

1. The injection filters need to be back-flushed on a regular basis to keep the system running smoothly. During the back-flush cycle the back-flush water is routed to the associated reservoir or pit. This removes the coal fines and sand from the filters and the system.
2. They will also serve as emergency water storage in case the injection wells stop operating.

Yates may submit a sundry and bond for the use of federally produced water in the secondary impoundments if the project requires additional water storage and to confirm whether there are any changes in features or use not analyzed in this EA. Monitoring may be required based upon shallow groundwater investigations required for new impoundments by the WDEQ. Bonding of all reservoirs will occur prior to beginning reservoir construction.

BFO evaluated all water management facilities for compliance with best management practices during the onsite.

As stated in the PRB FEIS, sediments exposed to CBNG-produced water and stored in impoundments and downstream channels may require special handling during reclamation due to the potential to concentrated compounds in those materials (see PRB FEIS, p. 4- 120). In order to establish soil chemistry target ranges for reclamation, baseline soil samples will be collected from the proposed impoundments and analyzed for the standard WYPDES permit suite of parameters plus soil specific characteristics.

Produced Water Quantity

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow, p. 4-74). Consequently, the volume of water produced from these wells may result in the addition of 0.9 cfs below the lowest reservoir if all the water were discharged to the surface (after infiltration and evapotranspiration losses). The operator committed to monitor the condition of channels and address any problems resulting from discharge. Discharge from the impoundments will potentially allow for streambed enhancement through wetland-riparian species establishment. Sedimentation will occur in the impoundments, but would be controlled through a concerted monitoring and maintenance program. BFO recommends that the Operator submit phased reclamation plans for the impoundments and that BFO approve these on a site-specific, case-by-case basis as the impoundment(s) are no longer needed for disposal of CBNG water, see BLM applied COAs.

Alternative (2A) of the approved alternative in the Record of Decision for the PRB FEIS, states that the peak production of water discharged to the surface will occur in 2006 at a total contribution to the main-stem of the Upper Powder River of 68 cfs, p. 4-86). The predicted maximum discharge rate from these wells is anticipated to be a total of 2,600 gpm or 5.79 cfs to impoundments and injection wells. Using an assumed conveyance loss of 20% (PRB FEIS, p. 4-74) and full containment, the produced water re-surfacing in Beaver Creek from this action (0.9 cfs) may add a maximum 0.7 cfs to the Upper Powder River flows, or 1.0% of the predicted total CBNG produced water contribution For more information regarding the maximum predicted water impacts resulting from the discharge of produced water, see Table 4-6 (PRB-FEIS, p. 4-85).

The Operator provided an analysis of the potential development in the watershed above the project area in the WMP, p. 5. Based on the area of the Beaver Creek watershed above the POD (56.37 sq mi) and an assumed density of 1 wells per location every 80 acres, the potential exists for the development of 451 wells which could produce a maximum flow rate of 23,452 gpm (52.3 cfs) of water. The BLM agrees with the Operator that this is not expected to occur because:

1. Some of these wells are drilled and are producing.
2. The phasing in of new wells takes several years; and
3. A decline in well water discharge generally occurs after several months of operation.

The potential maximum flow rate of produced water within the watershed upstream of the project area, 52.3 cfs, is much less than the volume of runoff estimated from the 2-year storm event for 418.00 cfs of the drainage (WMP, p. 5).

Springs

There were no natural springs identified by the operator for the Napier Road POD within 0.5 mile radius of the POD boundary.

The WMP for the Napier Road POD addressed in-channel downstream impacts.

4.2.5.2.2. Cumulative Effects

This analysis 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).

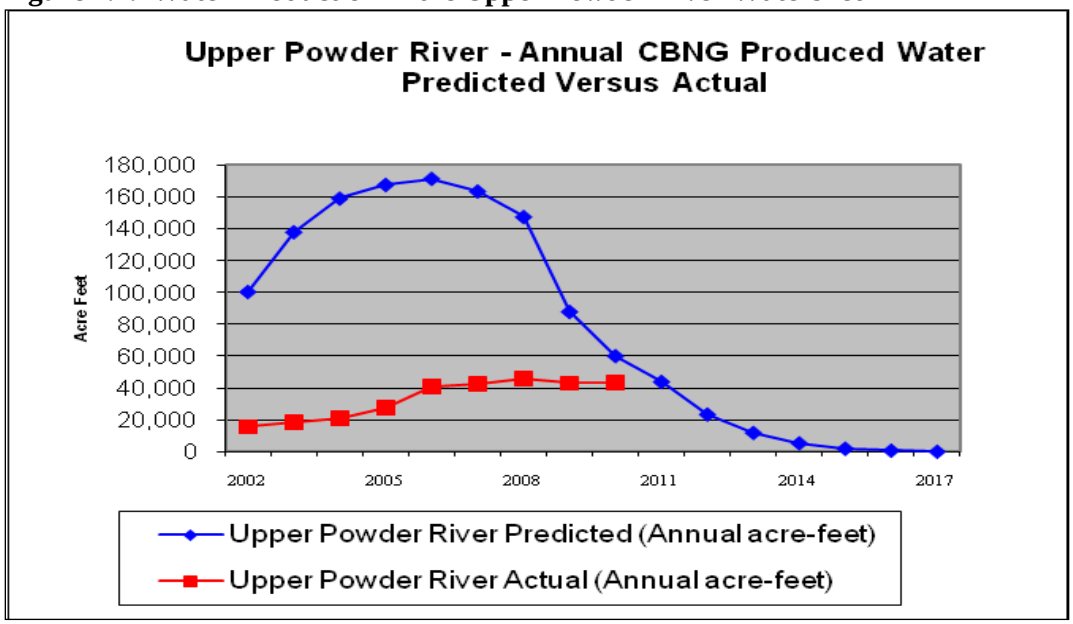
As of December 2009, all producing CBNG wells in the Upper Powder River watershed discharged a cumulative volume of 298,864 acre-feet of water compared to the predicted 1,195,886 acre-feet disclosed in the PRB FEIS (Table 2-8, p. 2-26). These figures are presented graphically in Figure 4.2 and Table 4.5., following. This volume is 25.0 % 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

2010 Data Update 04-06-11

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
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	43,079	48.9	255,601	22.5
2010	60,319	1,195,886	43,263	71.7	298,864	25.0
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				
Total	1,285,233		298,864			

Figure 4.2. 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 10 primary watersheds in the PRB. 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 25.0% of the total predicted in the PRB FEIS.
2. The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect downstream irrigation.
3. The commitment by the operator to manage the volume of water discharged.

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

4.2.5.2.3. Mitigation Measures

Mitigation measures the BFO should consider include the following. 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 committed to monitor the water discharge points and the channels downstream for stability. If erosion is noted, the operator will be required to repair and stabilize the area using selected mitigation techniques. The operator also committed to expediently stabilize and revegetate disturbance within channel and floodplain associated with this project.

4.2.5.2.4. Residual Effects

"Streams enhanced by large volumes of CBNG produced water may begin to establish meander patterns on longer wavelengths in response to increased flows. Stream drainages would readjust to their existing natural flows at the end of the project's life. Down cutting (stream erosion) and sediment deposition (aggradation) are natural processes that occur as stream drainages age through time. Down cutting occurs within the upper reaches of a drainage system as the stream channel becomes incised through erosion, until the slope of the stream and its velocity are reduced and further erosion is limited. Sediment is deposited within the lower, slower reaches of a stream.

Surface drainages could be degraded from erosion caused by increased surface flow, unless rates of CBNG produced water discharge and outfall locations are carefully controlled. Increased flows could cause down cutting in fluvial environments, resulting in increased channel capacity over time within the upper and middle reaches of surface drainages." (PRB FEIS, p. 4-118)

4.2.6. Economics of CBNG Resource Extraction

4.2.6.1. Direct and Indirect Effects

Alternative B includes the proposed roads and pipeline networks needed to support the proposed gas wells. Under Alternative B 50 wells with TL's, COA's applied would be approved. The project would potentially produce (in the course of project life span approximately 10-15 years) 13,689,263 MCF of CBNG and would generate about $49.4 million in measured in the present value (PV) of the revenue stream. Payments in the form of the PV of the royalty stream would amount to nearly $5.2 million paid to the US Government general treasury. Of those federal royalties, the State of Wyoming would receive a little over $2.5 million.

Napier Road POD proposed 50 CBNG wells, Table 2.1. BLM petroleum engineers reviewed well logs from within or near the project area to determine what Napier Road CBNG wells potentially could produce. It is worth noting that many of the CBNG wells in the project vicinity were not producing gas long enough to determine peak values for gas production and therefore no production curves were analyzed. Since all wells do not produce the same amount of gas due to the thickness or quality of coal formation which lie below each well, BLM grouped the wells in the POD boundary into areas where data was obtainable and created a weighted average for predicting CBNG production resulting from Napier Road wells. The BLM findings are in Table 4.6 and Table 4.7.

Table 4.6. Prediction of Total Produced CBNG by Section

Section #	Number of Wells in Section	Average MCF Per Well	Total Gas (MCF)
22, 23, 24, 25, 26	11	273,785	3,011,635
17, 21, 22	11	273,785	3,011,635
17, 7, 8	9	273,785	2,464,065
2, 10, 11, 14	8	273,785	2,190,280
30, 31, 6	11	273,785	3,011,635

Table 4.7. Prediction of Total Revenue

Number of Wells	Total Gas (MCF)	Total Revenue @ $4.00/MCF	PV of Total Revenue Stream Discounted @ 3.00%	Federal Royalties @ 12.5%	PV of Federal Royalties Discounted @ 3.00%	State of Wyoming - (49% of PV of Federal Royalty)
50	13,689,263	$54,757,051	$49,392,025	$6,844,631	$5,170,980	$2,533,780

4.2.6.2. 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 referenced PRB FEIS, Volume 2, Chapter 4, p. 4-336.

4.2.6.3. Mitigation Measures

Management actions specific to Alternative B require that drilling and construction activities are subject to timing restrictions and limitations for wildlife values such as timing limitations for special status species: raptors, sage-grouse, and swift fox. Additionally, COAs and BMPs for exploration, development, production, and reclamation will be applied to ensure that activities would not impact other resource values in the project area.

4.2.6.4. Residual Effects

The PRB FEIS described residual effects that fall within the analysis parameters for Alternative B.

4.2.7. Cultural Resources

4.2.7.1. Direct and Indirect Effects

The project will impact non-eligible sites 48CA3368, 48CA5053, 48CA5142, 48CA5172, 48CA5173, 48CA5175, 48CA6913, and 48CA6914. The project will not impact any historic properties. The BLM BFO followed the Wyoming State Protocol Section VI(A)(1) and electronically notified the Wyoming State Historic Preservation Officer (SHPO) on October 25, 2010 that no historic properties exist within the area potential effect. 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. The Standard COAs (General)(A)(1) explain further discovery procedures.

4.2.7.2. Cumulative Effects

Construction and development of oil and gas resources impacts cultural resources through ground disturbance, unauthorized collection, and visual intrusion of the setting of historic properties. This results in fewer archaeological resources available for study of past human life-ways, changes in human behavior through time, and interpreting the past to the public. Additionally, these impacts may compromise the aspects of integrity that make a historic property eligible for the National Register of Historic Places.

Recording and archiving basic information about archaeological sites and the potential for subsurface cultural materials in the proposed project area serve to partially mitigate potential cumulative effects to cultural resources.

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

4.2.7.3. 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).

When a project is constructed in an area with a high potential for buried cultural material, archaeological monitoring is often included as a condition of approval. Construction monitoring is performed by a qualified archeologist working in unison with construction crews. If buried cultural resources are located by the archeologist, construction is halted and the BLM consults with the State Historic Preservation Office (SHPO) on mitigation or avoidance. Due to the presence of alluvial deposits the operator will be required to have an archeologist monitor all earth moving activities associated with certain construction, as described in the site specific COA's.

4.2.7.4. 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.

4.3. Alternative C – Modified Action

Alternative C is a modification of Alternative B based on BLM removing 2 APDs, Lani CS Federal 1 and Niche CS Federal Com 9, and their infrastructure from the project proposal; as those APDs would will have exceptional direct and residual impacts to surface disturbance in an area which has little or no reclamation suitability or would impact the local ferruginous hawk population through a high likelihood of nest abandonment, respectively. Alternative C also analyzes economic projections of CBNG extraction and cultural resources based on the denial of the above 2 APDs. Alternative C incorporates by reference all the mitigation measures and their analysis from Alternative B – except that for the 2 denied APDs and the changes inherent in Alternative C's economic and cultural resource analysis.

4.3.1. Soils

4.3.1.1. Direct and Indirect Effects

The impacts to soils under Alternative C will be the within the parameters for surface disturbance and surface disturbance reclamation found in PRB FEIS and ROD.

4.3.1.1.1. Limited Reclamation Potential (LRP)

The impacts to LRP areas under Alternative C will be the within the parameters for surface disturbance and surface disturbance reclamation found in PRB FEIS and ROD.

4.3.1.1.1.1. Miscellaneous Areas

Construction impacts discussed specific to Lani CS Federal 1 (See Section 4, Soils Direct and Indirect Effects, Alternative B) will be avoided with the denial of this APD. Thus impacts under Alternate C to miscellaneous areas have reasonable likelihood of minimizing adverse effects from surface disturbance and are likely to receive successful reclamation.

<u>Badlands, Blown-out Lands, and Rock Outcrops</u>:
Most landscapes can be reclaimed using established conventional reclamation methods. However, some areas have unique characteristics that make achieving all the reclamation requirements unrealistic. Areas posing the most extreme reclamation challenges will be identified as having Limited Reclamation Potential (LRP). Such is the case with access road to Lani CS Federal 1; this location has highly sensitive and erosive soils, extremely sensitive vegetation types, soils with severe physical or chemical limitations

(See WY Reclamation Policy, Appendix C of this EA). Alternatives considered throughout the process were avoidance or unconventional site specific reclamation. BLM did not evaluate an unconventional site specific reclamation plan as one was not provided. Since an unconventional site specific reclamation plan was not provided, BLM will strongly consider avoidance in order to retain the project within the parameters of the PRB ROD and the Wyoming Reclamation Policy. This is in line with BFOs current policy to avoid impacts to badland and rock outcrop components. Authorizations for surface disturbing actions are based upon the assumption that a disturbance can ultimately be successfully reclaimed. BLM evaluated the operator's proposal and determined the disturbance associated with Lani CS Federal 1 could not be successfully reclaimed; see Section 4, Soils, Alternative B.

4.3.1.2. Cumulative Effects

The cumulative effects associated with Alternative C are likely inside analysis parameters and impacts described in the PRB RMP Amendment's ROD and the Wyoming BLM Reclamation Policy because the project's features under this alternative, avoid the most fragile LRP areas. For details on expected cumulative impacts, refer to the referenced PRB FEIS, Volume 2, Chapter 4.

The designation of the duration of disturbance is defined in the PRB FEIS (pp. 4-1 and 4-151). Most soil disturbances would be short term impacts with expedient interim reclamation and site stabilization.

4.3.1.3. Mitigation Measures

COAs, mitigation measures, surface upgrades, and applicant committed measures discussed in the MSUP would help to mitigate or reduce the impacts described above areas of this POD. In POD areas of steep topography, erosive soils and/or poor reclamation suitability, BLM will consider requesting a plan to stabilize topsoil within a 30-day period from the start of construction in those areas.

4.3.1.3.1. Residual Effects

Residual effects across the POD under Alternative C would include a long-term loss of soil productivity associated with well pads and roads. Residual effects were identified in the PRB FEIS (p. 4-408) such as the loss of vegetative cover, despite expedient reclamation, for several years until reclamation is successfully established.

4.3.2. Wildlife

4.3.2.1. Sensitive Species

4.3.2.1.1. Ferruginous Hawk

4.3.2.1.1.1. Direct and Indirect Effects

The PRB FEIS discussed impacts to ferruginous hawks, p. 4-262. The updated information here provided in the section on ferruginous hawks in Alternative B also applies under Alternative C. The BLM must comply with the terms and conditions in the MBTA and Alternative C supports that compliance and the BLM's compliance with the PRB RMP Amendment's ROD and the BLM's sensitive species policy.

Alternative C minimizes physical intrusion toward ferruginous hawks by reducing the overall amount of infrastructure within proximity of an active nest, and by spatially arranging that infrastructure so as to create the least amount of visual disturbance to incubating adults while they are on a nest. This type of measure is best accomplished through design features that occur during the project planning phase, prior to construction. This type of design feature preserved the physical integrity of the area such that the ferruginous hawk pair will continue to select and occupy the breeding territory and produce young. Such design features as found in Alternative C emphasize relocating infrastructure so that it is out of line-of-sight of nests during well maintenance activities (BLM 2010).

Alternative C reduces the likelihood of decreased nest productivity and abandonment and markedly reduces the likelihood of a causal or inadvertent taking.

4.3.2.1.1.2. Cumulative Effects

Refer to the referenced PRB FEIS, Volume 2, Chapter 4, p. 4-221 or details on expected cumulative impacts. See also the Raptor Section under Alternative B of EA. Existing and reasonably foreseeable CBNG development in the PBR would affect the ferruginous hawk population due to an increased human activity and maintenance activity occurring near nesting habitat during the production phase of CBNG wells.

4.3.2.1.1.3. Mitigation Measures

BLM will consider applying the following COA to active nests:
No surface disturbing activity shall occur within 0.5 mile of all identified (inside of round buffers, see map in the COAs) raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation will affect the wells and infrastructure depicted in the COA raptor map.

4.3.2.1.1.4. Residual Effects

Maintenance activity in the production phase during the nesting/breeding season will have an adverse impact toward active nests as described in ALT B. Nest that were inactive in the past 3 years will more than likely not become active again in the future by permitting a CBNG well within the biological buffer of inactive nest.

Yet even with the design features found in Alternative C the project-level disturbance may cause some ferruginous hawks abandon nests – though under this alternative nest abandonment is reduced. Timing stipulations apply only to surface disturbing activities and inadequately protect nesting or breeding raptors during necessary well or infrastructure maintenance activities which may take up to days to complete – markedly different from what appears in the 2003 FEIS, p. 4-218 under *Harassment and Displacement* reads, "Construction may result in displacement from affected habitats during the entire construction phase (a time frame of weeks to months), while production would result in displacement only during well visits (a time frame of hours)." Since about 14% of the known ferruginous hawk nests would not be protected by applying the 3-year inactivity rule since the hawks are prone to return to nests 3 or more years after apparent abandonment (see the ferruginous hawk section under Alternative B). Ferruginous hawks use multiple nests over multiple years the period between activities for any given nest should be longer. Nests that were inactive in the past 3 years will more than likely not become active again in the future by permitting a CBNG well within the biological buffer of inactive nest.

4.3.3. Economics of CBNG Resource Extraction

4.3.3.1. Direct and Indirect Effects

Alternative C includes much of the proposed roads and pipeline networks needed to support the proposed wells but would result in the elimination of up to 2 wells and associated infrastructure. Under Alternative C, 51 wells with timing limitations and / or COAs applied (largely analyzed under Alternative B) would be approved. The project would potentially produce 13,141,692 MCF of CBNG reserves and would generate about $45.6 million measured in the PV of the total revenue stream. The PV of the royalty stream would be nearly $5 million paid to the US Government general treasury. Of those federal royalties, the State of Wyoming would receive about $2.4 million.

Table 4.8. Comparison of Impacts of Fluid Minerals

Management Action	Total Gas (MCF)	Total Revenue @ $4.00/MCF	PV of Total Revenue Stream Discounted @ 3.00%	Federal Royalties @ 12.5 %	PV of Federal Royalties Discounted @ 3.00%	State of Wyoming - (49% of PV of Federal Royalty)
Alternative B	13,689,263	$54,757,051	$49,392,025	$6,844,631	$5,170,980	$2,533,780

Management Action	Total Gas (MCF)	Total Revenue @ $4.00/MCF	PV of Total Revenue Stream Discounted @ 3.00%	Federal Royalties @ 12.5 %	PV of Federal Royalties Discounted @ 3.00%	State of Wyoming - (49% of PV of Federal Royalty)
Alternative C (Modified Action)	13,141,692	$52,566,769	$45,592,639	$6,570,846	$4,964,140	$2,432,429

Alternative C will yield approximately 4% less revenue measured in the PV of the revenue stream to the Operator and about 4% less discounted royalties to the federal government and the State of Wyoming.

BLM located an alternative location for each well (Lani CS Federal 1 and Niche CS Federal Com 9) not approved within 200 meters (656 feet) of the proposed APD. If Yates chose to submit an APD for these locations there will be no loss in revenue stream to the operator and no reduction in royalties to the federal government and the State of Wyoming.

4.3.3.2. Cumulative Effects

Cumulative effects for Alternative C are similar to those identified in Alternative B, but it is important to acknowledge there would be a reduction in revenue associated with not approving up to 2 wells, which translates into about a 7.7% reduction in the PV of the total revenue stream associated with these wells.

The impact from the reduction in wells would reduce the drilling activities in conjunction with lowering production and associated revenue to the operators. Moreover, there would be a loss of about $207 thousand dollars in the PV of federal and state royalties, which translates into a loss of about 4 percent. Property taxes and severance taxes would also go down as a result of not approving these wells. The reduction in drilling and subsequent production would also produce a minor impact on the local economy measured in terms of the loss in personal income and employment. But without running a regional economic model, those impacts cannot be quantified. However, the loss in economic activity would be, to some unknown extent, offset by the benefits to other resources and activities. For example, there are both market and non-market benefits associated with the preservation of wildlife habitat, maintenance of open space, maintaining buffer zones around nesting areas for ferruginous hawks and creating and maintaining wildlife viewing areas for nonconsumptive recreation use. But in the absence of quantifying these values, the benefits and costs associated with the reduction in oil wells compared to enhancing the area for wildlife and wildlife viewing cannot be made. Nonetheless, these tradeoffs need to be considered, at least qualitatively, when making these decisions. And while the Napier Road POD project is primarily on private surface and/or landlocked federal surface, the benefit of a reduction in the number of wells approved is not just limited to private ranchers and those individuals that have access to the area, but there is also a non-use value component that would also add to the overall benefits of protecting this area.

4.3.3.3. Mitigation Measures

Mitigation measures for Alternative C are the same as those identified in Alternative B.

4.3.3.4. Residual Effects

Residual effects for Alternative C are the same as those identified in Alternative B.

4.3.4. Cultural

4.3.4.1. Direct and Indirect Effects

The impacts to cultural resources under Alternative C will be the same as Alternative B with the following exceptions: Non-eligible site 48CA6913 will not be impacted by the proposed project.

4.3.4.2. Cumulative Effects

Cumulative effects for Alternative C are the same as those identified in Alternative B.

4.3.4.3. Mitigation Measures

Mitigation measures Alternative C are the same as those identified in Alternative B.

4.3.4.4. Residual Effects

Residual effects for Alternative C are the same as those identified in Alternative B.

4.4. Summary of Wildlife Effects

Table 4.9. A Comparison of the Wildlife Cumulative Effects Associated with the Alternatives.

Resource/Species	Alternative A	Alternative B	Alternative C
Wildlife			
Big Game	No habitat loss or fragmentation. Would likely see increased traffic passing through due to surrounding mineral development	Greatest habitat loss.	Least habitat loss.
		Greatest habitat fragmentation.	Least habitat fragmentation.
Raptors	No habitat loss.	Greatest foraging habitat fragmentation.	Least foraging habitat fragmentation. Some nests will become precluded from future use.
	No wells authorized near nests.		
Migratory Birds	No habitat loss.	Greatest habitat loss.	Least habitat loss.
		Greatest habitat fragmentation.	Least habitat fragmentation.
	No habitat fragmentation.		
		Overhead electric poses predation & collision risk.	Overhead electric poses predation & collision risk.

Resource/Species	Alternative A	Alternative B	Alternative C
Threatened and Endangered Species			
Bald eagle	No habitat loss	Overhead electricity increasing mortality risk from electrocution. Reduce overhead electricity will eliminate risk from electrocution.	Same as B.
Sensitive Species			
Greater Sage Grouse	No habitat loss.	Greatest habitat loss.	Least habitat loss.
	No decision on overhead electricity. Overhead power could be routed through project area on private surface without BLM discretion increasing predation and collision risk. Grouse may avoid overhead power lines.	Greatest predation and collision risk associated with overhead power lines.	Same as B.
West Nile Virus	No Impact	Likely to have effect on the overall spread of WNV.	Same as B.

5. CONSULTATION & COORDINATION

BFO consulted with the agencies summarized in Table 5.1, on this proposed project to confirm compliance with applicable laws, regulations, and landowner wishes.

Table 5.1 Consultations

Contact	Title	Organization	Present at Onsite
Pauline Schuette	Biologist	US Fish and Wildlife Service	No
Rachel Matchin	Environmental Compliance Coordinator	Bill Barrett Corporation	No
Trigg Marquis	Landowner	Private Ranch	No
Eric Barlow	Landowner	Private Ranch	No

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 ROD.

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APPENDIX A: USFWS Letter

USFWS Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
5353 Yellowstone Road, Suite 308A
Cheyenne, Wyoming 82009

OCT 25 2010

In Reply Refer To:
ES-61411/WY10CPA0202

Memorandum

To: Field Manager, Bureau of Land Management, Buffalo Field Office, Buffalo, Wyoming

From: Acting Field Supervisor, U.S. Fish and Wildlife Service, Wyoming Field Office, Cheyenne, Wyoming Scott Hicks

Subject: Comments on Napier Road Plan of Development

We received an electronic mail dated September 22, 2010, from Travis Kern of your staff regarding the Napier Road Plan of Development (POD) to drill 50 coalbed methane (CBM) wells. This POD is located in T. 47-48 N., R. 75 W. in Campbell County, Wyoming. Mr. Kern requested recommendations from the U.S. Fish and Wildlife Service (Service) for 14 wells and 2 reservoirs proposed near raptor or eagle nests.

General Recommendations

We are providing you with recommendations concerning migratory birds in accordance with the Migratory Bird Treaty Act (MBTA), 16 U.S.C. 703, and the Bald and Golden Eagle Protection Act (BGEPA), 16 U.S.C. 668.

The MBTA, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations, and does not require intent to be proven. Section 703 of the MBTA states, "Unless and except as permitted by regulations ... it shall be unlawful at any time, by any means or in any manner, to ... take, capture, kill, attempt to take, capture, or kill, or possess ... any migratory bird, any part, nest, or eggs of any such bird..." The BGEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing.

Work that could lead to the take of a migratory bird or eagle, their young, eggs, or nests (for example, if you are going to erect new roads, or power lines in the vicinity of a nest), should be coordinated with our office before any actions are taken. Enclosed please find our general

recommendations for the protection of eagles and other raptor species. We strongly encourage project proponents to fully implement the protective measures described in the enclosures in order to help ensure compliance with the MBTA and the BGEPA. We are also available to assist you in developing a project specific plan to address the MBTA and BGEPA concerns. Removal or destruction of such nests or causing abandonment of a nest could constitute violation of one or both of the above statutes.

Ferruginous Hawk Status in Wyoming

There is broad concern over the conservation status of the ferruginous hawk. Therefore, in addition to helping ensure compliance with the MBTA, implementing protective measures for this species now is likely to maintain or improve its conservation status and may help to preclude the need for additional protections in the future.

Several efforts have highlighted the concern for the conservation status of the ferruginous hawk. The Service's *Birds of Conservation Concern (2008)* (BCC) report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are ***likely to become candidates for listing***" under the Endangered Species Act. The BCC report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners. The *Wyoming Partners in Flight Wyoming Bird Conservation Plan* identifies priority bird species and habitats, and establishes objectives for bird populations and habitats in Wyoming. This plan assigns the ferruginous hawk as a "Conservation Priority Level I (Conservation Action): Species clearly needs conservation action." Lastly, the Wyoming Game and Fish Department (WGFD) currently lists the ferruginous hawk as NSS3, indicating a restricted or declining population with extirpation possible, but not necessarily imminent. This designation generally recognizes suitable habitat as vulnerable to ongoing disturbance and loss.

As you are aware, the Wyoming State Office of the Bureau lists the ferruginous hawk as a Sensitive Species. The Bureau developed this designation to "ensure that any actions on public lands consider the overall welfare of these sensitive species and do not contribute to their decline." Sensitive species management will include: determining the distribution and current habitat needs of sensitive species; incorporating sensitive species in land use and activity plans; developing conservation strategies; ensuring that sensitive species are considered in National Environmental Policy Act analyses; and prioritizing necessary conservation work (USDI Bureau of Land Management 2001).

Specific Recommendations

<u>Hamlet CS Federal Com. #2 (NENW S14, T47N, R75W)</u>

According to the Bureau's GIS database, there are a total of seven ferruginous hawk nests within 1.0 mile of this well (one within 0.25 mile, two within 0.5 mile, and four within 1.0 mile). Nest #4091 was active in 2005 and 2007, and nest #5873 was occupied in 2007. The Service recommends that the Hamlet CS Federal Com. #2 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Mahalo CS Federal #3 (NESW S6, T47N, R75W)
According to the Bureau's GIS database, there are eight raptor nests within 1.0 mile of this well (one red-tailed hawk nest at 0.25 mile, and three unknown raptor nests and four ferruginous hawk nests within 1.0 mile). The red-tailed hawk nest (#4708) was active in 2008 and 2006; however, it is located near the Service's 0.25-mile recommended buffer. The Service recommends a 1.0-mile spatial buffer around the ferruginous hawk nests.

Niche CS Federal Com. #1 (NESE S2, T47N, R75W)
According to the Bureau's GIS database, there are two ferruginous hawk nests located within 0.25 mile of this well (#5222 is only 0.06 mile from the well, and #10286 is only 0.12 mile from the well). Additionally, there is another ferruginous hawk nest within 0.5 mile, and six more within 1.0 mile. The Service recommends that the Niche CS Federal Com. #1 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Niche CS Federal Com. #8 (SWSE S8, T47N, R75W)
There are no raptor or eagle nests within the Service's recommended buffers; therefore, the Service does not have concerns with the location of this well.

Niche CS Federal Com. #9 (SWNE S31, T48N, R75W)
According to the Bureau's GIS database, there is one ferruginous hawk nest at 0.11 mile of the well (nest #8354 was active in 2009), one ferruginous hawk nest within 0.5 mile, and eight more ferruginous hawk or unknown raptor nests within 1 mile. During a field visit October 3, 2010, two of these ferruginous hawk nests were identified as in very good or excellent condition, and one had eggs remaining in it. Both of these nests were documented by Jones and Stokes as being inactive this season. It seems likely that these nests are part of the same territory as nest #8354, and the pair that nested at that nest in 2009 may have nested at this alternate nest location in 2010. Because of the ferruginous hawk nest activity in this area, the Service strongly recommends that the Niche CS Federal Com. #9 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Niche CS Federal #12 (SWSE S31, T48N, R75W)
According to the Bureau's GIS database, there are three ferruginous hawk nests within 0.25 mile of the well (nest #8353 was inactive/good condition, nest #2531 was active in 2010 with five eggs/failed, and nest #8356 was inactive in 2010). The road to this well is proposed less than 0.1 mile from ferruginous hawk nest #8354, which is in excellent condition and was active in 2009. Because of the ferruginous hawk nest activity in this area, the Service strongly recommends that the Niche CS Federal #12 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area. Since the access road for the #12 well is the same proposed for the Niche CS Federal #11 well, the Service also recommends moving the #11 well and access road outside of the 1-mile buffer.

Waikiki CS Federal #4 (SWSE S17, T47N, R75W)
According to the Bureau's GIS database, there are three ferruginous hawk nests within 0.25 mile of the well; one was active in 2007 (nest #3879). There are three other ferruginous hawk nests within 1 mile, and one unknown nest. None of these nests were surveyed in 2010, but one was

active in 2007 and another was occupied with ferruginous hawks in 2007. The Service recommends that the Waikiki CS Federal #4 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Mandarin CS Federal #6 (NENW S25, T47N, R75W)
According to the Bureau's GIS database, there are three ferruginous hawk nests within 0.25 mile of the well, four more within 0.5 mile, and five more within 1 mile. Additionally, there are two man-made nest structures within 1 mile. In 2008, one nest within 0.5 mile was occupied, and one of the nest structures was active (failed) in 2008. The Service recommends that the Mandarin CS Federal #6 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Pineapple CS Federal #1 (NENE S23, T47N, R75W)
According to the Bureau's GIS database, there are nine ferruginous hawk nests within 1 mile of the well; two within 0.25 mile, and five within 1 mile. One nest within 1 mile was active in 2005 and 2007, and another was occupied in 2007. The Service recommends that the Pineapple CS Federal #1 well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Pineapple CS Federal #4 and Pineapple Injector Federal #6 (NESW S23, T47N, R75W)
According to the Bureau's GIS database, there are seven ferruginous hawk nests within 1 mile of the wells; one within 0.25 mile, one within 0.5 mile, and five within 1 mile. One nest within 1 mile was active in 2005 and 2007 and another was active in 2007 and 2008. The Service recommends that the wells be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Pineapple CS Federal #5 (SWSE S23, T47N, R75W)
According to the Bureau's GIS database, there are ten ferruginous hawk nests within 1 mile of the well; two within 0.25 mile and eight within 1 mile. Two nests on man-made structures were active in 2008, and another was occupied in 2008. The Service recommends that the well be moved outside of a 1.0-mile spatial buffer to protect the ferruginous hawk nests in this area.

Lani CS Federal #1 (SWNW S30, T48N, R75W)
There is a golden eagle nest (#10279) only 0.3 mile from this well location. The nest is in line of sight of the well and the access to the well. The Service recommends that the well be moved outside of a 0.5-mile spatial buffer to protect the golden eagle nest. During an onsite on October 3, Pauline Schuette of my staff observed that the well, as proposed, did not appear to be adequately out of line of sight of the nest (typically out of line of sight refers to intervening topography or vegetation that screens the nest site from the proposed disturbance and thus allows for a reduced buffer recommendation). During this onsite, we recommended that this well be moved to the other side of Napier Road to create an acceptable buffer for the nest. If the well is moved to the other side of the road, a January 15 through July 31 seasonal buffer is also recommended.

Lani CS Federal #2 (SWSW S30, T48N, R75W)
There is a golden eagle nest (#10279) only 0.1 mile from this well location, and is in direct line of sight. The Service recommends that this well be moved outside of a 0.5-mile spatial buffer to protect the nest. However, during an onsite on October 3, Pauline Schuette recommended that the well location could be moved southeast back towards an existing power line. Although it would not be outside the 0.5-mile buffer, it would likely be adequately buffered by a hill and also near an existing disturbance. With this move, a January 15 through July 31 seasonal buffer is also recommended.

Reservoirs
There are several reservoirs proposed within this POD. In general, the Service recommends that disturbances not occur within 1 mile of ferruginous hawk nests, or that a seasonal buffer of February 15 through July 31 be attached to these reservoirs, so that sampling or other disruptive activities not occur during the nesting season. The Turtle Reservoir is proposed between two ferruginous hawk nests (#10297 and #10298) and the edges will be only 20 feet from each nest. The Service strongly recommends that this reservoir be moved away from the nests.

Overhead Power Lines and Power Drops
The overhead power line in Section 31, T48N, 75W, is proposed along the west side of Napier Road. There are several active ferruginous hawk nests in this section and the power line is proposed only a few meters from these nests. A power drop is also proposed next to an active ferruginous hawk nest. The Service recommends that this power line and power drop be moved to the east side of Napier Road, where no raptor nests are located.

Thank you for your efforts to ensure the conservation of migratory birds and eagles in Wyoming. If you have any questions regarding this letter or your responsibilities under the MBTA or BGEPA, please contact Pauline Schuette at (307) 684-1069.

Attachment (1)

cc: WGFD, Statewide Habitat Protection Coordinator, Cheyenne, WY (M. Flanderka)
WGFD, Non-Game Coordinator, Lander, WY (B. Oakleaf)
BLM, Wildlife Biologist, Buffalo, WY (S. Jawors)
BLM, Natural Resources Specialist, Buffalo, WY (T. Kern)
BLM, T&E Species Coordinator, Cheyenne, WY (T. Abbott)

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Literature Cited

U.S. Bureau of Land Management. 2001. Instruction memorandum no. WY-2001-040, sensitive species policy and list. U.S. Bureau of Land Management, Cheyenne, Wyoming.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <http://www.fws.gov/migratorybirds/>]

U.S. Fish and Wildlife Service, Wyoming Ecological Services Field Office

Protections for Raptors

Raptors, or birds of prey, and the majority of other birds in the United States are protected by the Migratory Bird Treaty Act, 16 U.S.C. 703 (MBTA). A complete list of migratory bird species can be found in the Code of Federal Regulations at 50 CFR 10.13. Eagles are also protected by the Bald and Golden Eagle Protection Act, 16 U.S.C. 668 (Eagle Act).

The MBTA protects migratory birds, eggs and nests from possession, sale, purchase, barter, transport, import, export, and take. The regulatory definition of take, defined in 50 CFR 10.12, means to pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to hunt, shoot, wound, kill, trap, capture, or collect a migratory bird. Activities that result in the unpermitted take (e.g., result in death, possession, collection, or wounding) of migratory birds or their eggs are illegal and fully prosecutable under the MBTA. Removal or destruction of active nests (i.e., nests that contain eggs or young), or causing abandonment of an active nest, could constitute a violation of the MBTA, the Eagle Act, or both statutes. Removal of any active migratory bird nest or any structure that contains an active nest (e.g., tree) where such removal results in take is prohibited. Therefore, if nesting migratory birds are present on or near a project area, project timing is an important consideration during project planning. As discussed below, the Eagle Act provides additional protections for bald and golden eagles and their nests. For additional information concerning nests and protections under the MBTA, please see the U.S. Fish and Wildlife Service's (Service) Migratory Bird Permit Memorandum, MBMP-2.

The Service's Wyoming Ecological Services Field Office works to raise public awareness about the possible occurrence of birds in proposed project areas and the risk of violating the MBTA, while also providing guidance to minimize the likelihood that take will occur. We encourage you to coordinate with our office before conducting actions that could lead to the take of a migratory bird, their young, eggs, or active nests (e.g., construction or other activity in the vicinity of a nest that could result in a take). If nest manipulation is proposed for a project in Wyoming, the project proponent should also contact the Service's Migratory Bird Office in Denver at 303-236-8171 to see if a permit can be issued. Permits generally are not issued for an active nest of any migratory bird species, unless removal of the nest is necessary for human health and safety. If a permit cannot be issued, the project may need to be modified to ensure take of migratory birds, their young or eggs will not occur.

For infrastructure (or facilities) that have potential to cause direct avian mortality (e.g., wind turbines, guyed towers, airports, wastewater disposal facilities, transmission lines), we recommend locating structures away from high avian-use areas such as those used for nesting, foraging, roosting or migrating, and the travel zones between high-use areas. If the wildlife survey data available for the proposed project area and vicinity do not provide the detail needed to identify normal bird habitat use and movements, we recommend collecting that information prior to determining locations for any infrastructure that may create an increased potential for avian mortalities. We also recommend contacting the Service's Wyoming Ecological Services office for project-specific recommendations.

Additional Protections for Eagles

The Eagle Act protections include provisions not included in the MBTA, such as the protection of unoccupied nests and a prohibition on disturbing eagles. Specifically, the Eagle Act prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, chicks or eggs, which includes collection, possession, molestation, disturbance, or killing. The term "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.3 and see also 72 FR 31132).

The Eagle Act includes limited exceptions to its prohibitions through a permitting process. The Service has issued regulations concerning the permit procedures for exceptions to the Eagle Act's prohibitions (74 FR 46836), including permits to take golden eagle nests which interfere with resource development or recovery operations (50 CFR 22.25). The regulations identify the conditions under which a permit may be issued (i.e., status of eagles, need for action), application requirements, and other issues (e.g., mitigation, monitoring) necessary in order for a permit to be issued.

For additional recommendations specific to Bald Eagles please see our Bald Eagle information web page (http://www.fws.gov/wyominges).

Recommended Steps for Addressing Raptors in Project Planning

Using the following steps in early project planning, agencies and proponents can more easily minimize impacts to raptors, streamline planning and permitting processes, and incorporate measures into an adaptive management program:

1. Coordinate with appropriate Service offices, Wyoming Game and Fish Department, Tribal governments, and land-management agencies at the earliest stage of project planning.
2. Identify species and distribution of raptors occurring within the project area by searching existing data sources (e.g., Wyoming Game and Fish Department, Federal land-management agencies) and by conducting on-site surveys.
3. Plan and schedule short-term and long-term project disturbances and human-related activities to avoid raptor nesting and roosting areas, particularly during crucial breeding and wintering periods
4. Determine location and distribution of important raptor habitat, nests, roost sites, migration zones and, if feasible, available prey base in the project impact area.
5. Document the type, extent, timing, and duration of raptor activity in important use areas to establish a baseline of raptor activity.
6. Ascertain the type, extent, timing, and duration of development or human activities proposed to occur, and the extent to which this differs from baseline conditions.
7. Consider cumulative effects to raptors from proposed projects when added to past, present, and reasonably foreseeable actions. Ensure that project mitigation adequately addresses cumulative effects to raptors.
8. Minimize loss of raptor habitats and avoid long-term habitat degradation. Mitigate for unavoidable losses of high-valued raptor habitats, including (but not limited to) nesting, roosting, migration, and foraging areas.
9. Monitor and document the status of raptor populations and, if feasible, their prey base post project completion, and evaluate the success of mitigation efforts.
10. Document meaningful data and evaluations in a format that can be readily shared and incorporated into wildlife databases (contact the Service's Wyoming Ecological Services office for details).

Protection of nesting, wintering (including communal roost sites), and foraging activities is considered essential to conserving raptors. In order to promote the conservation of migratory bird populations and their habitats, Federal agencies should implement those strategies directed by Executive Order 13186, "Responsibilities of Federal Agencies To Protect Migratory Birds" (66 FR 3853).

Recommended Seasonal and Spatial Buffers to Protect Nesting Raptors

Because many raptors are particularly sensitive to disturbance (that may result in take) during the breeding season, we recommend implementing spatial and seasonal buffer zones to protect individual nest sites/territories (Table 1). The buffers serve to minimize visual and auditory impacts associated with human activities near nest sites. Ideally, buffers would be large enough to protect existing nest trees and provide for alternative or replacement nest trees. The size and shape of effective buffers vary depending on the topography and other ecological characteristics surrounding the nest site. In open areas where there is little or no forested or topographical separation, distance alone must serve as the buffer. Adequate nesting buffers will help ensure activities do not take breeding birds, their young or eggs. For optimal conservation benefit, we recommend that no temporary or permanent surface occupancy occur within species-specific spatial buffer zones. For some activities with very substantial auditory impacts (e.g., seismic exploration and blasting) or visual impacts (e.g., tall drilling rig), a larger buffer than listed in Table 1 may be necessary, please contact the Service's Wyoming Ecological Services office for project specific recommendations on adequate buffers.

As discussed above, for infrastructure that may create an increased potential for raptor mortalities, the spatial buffers listed in Table 1 may not be sufficient to reduce the incidence of raptor mortalities (for example, if a wind turbine is placed outside a nest disturbance buffer, but inadvertently still within areas of normal daily or migratory bird movements); therefore, please contact the Service's Wyoming Ecological Services office for project specific recommendations on adequate buffers.

Buffer recommendations may be modified on a site-specific or project-specific basis based on field observations and local conditions. The sensitivity of raptors to disturbance may be dependent on local topography, density of vegetation, and intensity of activities. Additionally, individual birds may be habituated to varying levels of disturbance and human-induced impacts. Modification of protective buffer recommendations may be considered where biologically supported and developed in coordination with the Service's Wyoming Ecological Services Field Office.

Because raptor nests are often initially not identified to species (e.g., preliminary aerial surveys in winter), we first recommend a generic raptor nest seasonal buffer guideline of January 15th – August 15th. Similarly, for spatial nesting buffers, until the nesting species has been confirmed, we recommend applying a 1-mile spatial buffer around the nest. Once the raptor species is confirmed, we then make species-specific and site-specific recommendations on seasonal and spatial buffers (Table 1).

Activities should not occur within the spatial/seasonal buffer of any nest (occupied or unoccupied) when raptors are in the process of courtship and nest site selection. Long-term land-use activities and human-use activities should not occur within the species-specific spatial buffer of occupied nests. Short-term land use and human-use activities proposed to

occur within the spatial buffer of an occupied nest should only proceed during the seasonal buffer after coordination with the Service, State, and Tribal wildlife resources management agencies, and/or land-management agency biologists. If, after coordination, it is determined that due to human or environmental safety or otherwise unavoidable factors, activities require temporary incursions within the spatial and seasonal buffers, those activities should be planned to minimize impacts and monitored to determine whether impacts to birds occurred. Mitigation for habitat loss or degradation should be identified and planned in coordination with applicable agencies.

Please contact the Service's Wyoming Ecological Services Field Office if you have any questions regarding the status of the bald eagle, permit requirements, or if you require technical assistance regarding the MBTA, Eagle Act, or the above recommendations. The recommended spatial and seasonal buffers are voluntary (unless made a condition of permit or license) and are not regulatory, and they do not supersede provisions of the MBTA, Eagle Act, Migratory Bird Permit Memorandum (MBMP-2), and Endangered Species Act. Assessing legal compliance with the MBTA or the Eagle Act and the implementing regulations is ultimately the authority and responsibility of the Service's law enforcement personnel. Our recommendations also do not supersede Federal, State, local, or Tribal regulations or permit conditions that may be more restrictive.

Table 1. Service's Wyoming Ecological Services Field Office's Recommended Spatial and Seasonal Buffers for Breeding Raptors

Raptors of Conservation Concern (see below for more information)

Common Name	Spatial buffer (miles)	Seasonal buffer
Golden Eagle	0.5	January 15 - July 31
Ferruginous Hawk	1	March 15 - July 31
Swainson's Hawk	0.25	April 1 - August 31
Bald Eagle	see our Bald Eagle information web page	
Prairie Falcon	0.5	March 1 - August 15
Peregrine Falcon	0.5	March 1 - August 15
Short-eared Owl	0.25	March15- August 1
Burrowing Owl	0.25	April 1 – September 15
Northern Goshawk	0.5	April 1 - August 15

Additional Wyoming Raptors

Common Name	Spatial buffer (miles)	Seasonal buffer
Osprey	0.25	April 1 - August 31
Cooper's Hawk	0.25	March 15 – August 31
Sharp-shinned Hawk	0.25	March 15 – August 31
Red-tailed Hawk	0.25	February 1 – August 15
Rough-legged Hawk (winter resident only)	----	----
Northern Harrier	0.25	April 1 - August 15
Merlin	0.5	April 1 - August 15
American Kestrel	0.125	April 1 – August 15
Common Barn Owl	0.125	February 1 – September 15
Northern Saw-whet Owl	0.25	March 1 - August 31
Boreal Owl	0.25	February 1 – July 31
Long-eared Owl	0.25	February 1 – August 15
Great Horned Owl	0.125	December 1 – September 30
Northern Pygmy-Owl	0.25	April 1 – August 1
Eastern Screech -owl	0.125	March 1 – August 15
Western Screech-owl	0.125	March 1 – August 15
Great Gray Owl	0.25	March 15 – August 31

Raptors of Conservation Concern

The Service's Birds of Conservation Concern (2008) report identifies "species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing" under the Endangered Species Act (16 U.S.C 1531 et seq.). This report is intended to stimulate coordinated and proactive conservation actions among Federal, State, and private partners. The Wyoming Partners in Flight Wyoming Bird Conservation Plan identifies priority bird species and habitats, and establishes objectives for bird populations and habitats in Wyoming. This plan also recommends conservation actions to accomplish the population and habitat objectives.

We encourage project planners to develop and implement protective measures for the Birds of Conservation Concern as well as other high-priority species identified in the Wyoming Bird Conservation Plan. For additional information on the Birds of Conservation Concern that occur in Wyoming, please see our Birds of Conservation Concern web page.

Additional Planning Resources

Avian Power Line Interaction Committee (APLIC). 2006. Suggested Practices for Avian Protection on Power Lines: The State of the Art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Edison Electric Institute and the Raptor Research Foundation. 1996. Suggested Practices for Raptor Protection on Power Lines - The State of the Art in 1996. Washington, D.C.

Edison Electric Institute's Avian Power Line Interaction Committee and U.S. Fish and Wildlife Service. 2005. Avian Protection Plan Guidelines.

Edison Electric Institute and the Raptor Research Foundation. 1994. Mitigating Bird Collisions with Power Lines - The State of the Art in 1994. Washington, D.C.

U.S. Fish and Wildlife Service. 2000. Siting, Construction, Operation and Decommissioning of Communications Towers and Tower Site Evaluation Form (Directors Memorandum September 14, 2000). Arlington, Virginia.

U.S. Fish and Wildlife Service. 2007. National Bald Eagle Management Guidelines. United States Department of Interior, Fish and Wildlife Service, Arlington, Virginia. 23 pp.

Wyoming Game and Fish Department Internet Link to Raptor Information

References

50 CFR 10.12 – Code of Federal Regulations. Title 50--Wildlife and Fisheries, Chapter I--United States Fish and Wildlife Service, Department of the Interior, Part 10--General Provisions.

50 CFR 10.13– Code of Federal Regulations. Title 50--Wildlife and Fisheries, Chapter I--United States Fish and Wildlife Service, Department of the Interior, Part 10--General Provisions.

50 CFR 22.3 – Code of Federal Regulations. Title 50--Wildlife and Fisheries, Chapter I--United States Fish and Wildlife Service, Department of the Interior, Part 22—Eagle Permits.

50 CFR 22.25– Code of Federal Regulations. Title 50--Wildlife and Fisheries, Chapter I--United States Fish and Wildlife Service, Department of the Interior, Part 22—Eagle Permits.

66 FR 3853 - Presidential Documents. Executive Order 13186 of January 10, 2001. Responsibilities of Federal Agencies To Protect Migratory Birds. Federal Register, January 17, 2001.

72 FR 31132 - Protection of Eagles; Definition of "Disturb". Final Rule. Federal Register, June 5, 2007.

74 FR 46836 - Eagle Permits; Take Necessary To Protect Interests in Particular Localities. Final Rule. Federal Register, September 11, 2009.

U.S. Fish and Wildlife Service. 2003. Migratory Bird Permit Memorandum, MBMP-2, Nest Destruction (Directors Memorandum April 15, 2003), Washington, D.C.

U.S. Fish and Wildlife Service. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp.

APPENDIX B: Raptor Nest Tables, Affected Resource List, Threatened and Endangered Species Worksheet, Sensitive Species Worksheet

Table 3.8. Active nests within 0.5 miles of the Napier POD

	BLM ID	UTMs	Legal	Sub-strate	Year	Condition	Status	Species
1	2528	427568E 4878109N	S17 T47N R75W	CTL	2010	Nest Gone	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Remnants	ACTI	GRHO
					2007	Nest Gone	INAC	n/a
					2006	Nest Gone	INAC	n/a
					2005	Nest Gone	INAC	n/a
					2004	Good	ACTI	GOEA
2	2531	426735E 4881817N	S31 T47N R75W	GHS	2010	Excellent	ACTI	FEHA
					2009/2006	Unknown	INAC	n/a
					2005	Excellent	ACTI	FEHA
3	3383	434961E 4875834N	S24 T47N R75W	CTL	2010	Nest Gone	INAC	n/a
					2009	Remnants	INAC	n/a
					2008	Good	ACTF	RETA
					2007	Good	INAC	n/a
					2006	Good	INAC	n/a
					2005	Good	ACTI	RETA
					2004	Nest Gone	INAC	n/a
					2003	Good	ACTI	RETA
4	3384	428287E 4879170N	S8 T47N R75W	CTL	2010	Fair	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	ACTI	RETA
					2007	Poor	INAC	n/a
					2006	Good	ACTI	RETA
					2005	Good	ACTI	RETA
					2004	Nest Gone	INAC	n/a
5	3385	428666E 4878042N	S16 T47N R75W	CTL	2010	Unknown	INAC	n/a
					2009	Unknown	INAC	n/a
					2008	Unknown	ACTI	AMKE
					2007	Nest Gone	INAC	n/a
					2006	Nest Gone	INAC	n/a
					2005	Good	ACTI	AMKE
					2004	Nest Gone	INAC	n/a

	BLM ID	UTMs	Legal	Sub-strate	Year	Condition	Status	Species
6	3386	429415E 4877681N	S16 T47N R75W	CTL	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	ACTI	GOEA
					2007	Good	ACTI	GOEA
					2006	Good	ACTI	GOEA
					2005	Fair	INAC	n/a
					2004	Nest Gone	INAC	n/a
7	3846	397299E 4892844N	S31 T49N R78W	CTL	2010	Poor	INAC	n/a
					2009	Nest Gone	INAC	n/a
					2008	Fair	ACTI	GRHO
					2007	Fair	INAC	n/a
					2006	Fair	INAC	n/a
					2005	Fair	INAC	n/a
					2004	Good	ACTI	RETA
8	4095	433882E 4874239N	S25 T47N R75W	MMS	2010	Nest Gone	INAC	n/a
					2009	Nest Gone	INAC	n/a
					2008	Good	ACTF	FEHA
					2007	Good	ACTI	FEHA
					2006	Good	ACTI	FEHA
					2005	Good	ACTI	FEHA
9	4596	431656E 4874618N	S27 T47N R75W	MMS	2010	Gone	INAC	n/a
					2008	Excellent	ACTI	FEHA
					2007	Excellent	ACTI	FEHA
10	4704	427216E 4880138N	S5 T47N R75W	CTL	2010	Good	INAC	n/a
					2009	Good	ACTI	RETA
					2008	Good	ACTI	RETA
					2007	Poor	INAC	n/a
					2006	Good	ACTI	RETA
11	4708	425825E 4881084N	S6 T47N R75W	CTL	2010	Fair	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	ACTI	RETA
					2008	Poor	INAC	n/a
					2007	Good	INAC	n/a
					2006	Good	ACTI	RETA
12	5867	425020E 4879917N	S12 T47N R76W	CTL	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	ACTI	GOEA
13	5868	426000E 4880980N	S6 T47N R75W	CTL	2010	Poor	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Good	ACTI	RETA

	BLM ID	UTMs	Legal	Sub-strate	Year	Condition	Status	Species
14	5870	424872E 4877992N	S13 T47N R76W	CTL	2010	Fair	INAC	n/a
					2009	Excellent	INAC	n/a
					2008	Good	ACTI	RETA
15	6355	433858E 4874303N	S25 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Fair	OCCU	FEHA
					2007	Unknown	INAC	n/a
16	6405	424881E 4881662N	S1 T47N R76W	CTL	2010	Good	INAC	n/a
					2009	Good	ACTI	RETA
					2008	Good	ACTI	GRHO
17	6406	424830E 4881456N	S1 T47N R76W	CTL	2010	Good	INAC	n/a
					2009	Good	ACTI	GRHO
					2008	Good	ACTI	RETA
18	8354	426372E 4882573N	S31 T48N R75W	GHS	2010	Good	INAC	n/a
					2009	Excellent	ACTI	FEHA
					2008	Good	ACTI	FEHA
19	10271	425307E 4884697N	S25 T48N R76W	CTL	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	ACTI	RETA
20	10281	426950E 4883510N	S30 T48N R75W	CTL	2010	Good	ACTI	RETA
					2009	Good	ACTI	RETA
21	10288	432241E 4878305N	S14 T47N R75W	CKB	2010	Good	ACTI	FEHA
					2009	Remnants	INAC	n/a
					2008	Remnants	INAC	n/a

Notes:
ABB = Abandoned burrow; CTD = Cottonwood - dead; CTL = Cottonwood – live; CKB = Creek bottom; MMS=Man made structure; ROK-Rock outcrop; JUN=Juniper tree; ACB= Active Burrow; GHS=Ground/Hillside
ACTF = Active failed; ACTI = Active; INAC = Inactive
BUOW = Burrowing Owl; FEHA=Ferruginous Hawk; GOEA = Golden Eagle; GRHO = Great horned Owl; RETA = Red-tailed Hawk

Table 3.9. Inactive Raptor Nests Occur Within 0.5 miles of the Napier POD,

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
1	673	431286E 4875586N	S22 T47N R75W	CTL	2010	Substrate Gone	INAC	n/a
					2009	Nest Gone	INAC	n/a
					2008	Nest Gone	INAC	n/a
					2007	Nest Gone	INAC	n/a
					2006	Unknown	ACTI	RETA

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
2	684	434338E 4874946N	S25 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Poor	INAC	n/a
3	1452	433341E 4874394N	S26 T47N R75W	GHS	2009	Nest Gone	INAC	n/a
					2008	Fair	OCCU	FEHA
					2007	Unknown	DNLO	n/a
					2006	Nest Gone	INAC	n/a
					2003	Good	INAC	n/a
4	2529	429248E 4878025N	S16 T47N R75W	CTL	2010	Nest Gone	INAC	n/a
					2009	Nest Gone	INAC	n/a
					2008	Nest Gone	INAC	n/a
					2005	Nest Gone	INAC	n/a
					2004	Good	ACTI	RETA
5	2782	434182E 4880697N	S1 T47N R75W	GHS	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
					2008	Good	INAC	n/a
6	3735	428030E 4876639N	S20 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Fair	INAC	n/a
7	3829	424896E 4884718N	S25 T48N R76W	CTL	2010	Poor	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Poor	INAC	n/a
8	3879	427984E 4876869N	S17 T47N R75W	CKB	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Poor	INAC	n/a
					2007	Good	ACTI	FEHA
9	3884	430138E 4874875N	S28 T47N R75W	CKB	2010	Remnants	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Poor	INAC	n/a
					2007	Poor	INAC	n/a
					2006	Good	ACTF	FEHA
10	3885	429995E 4874825N	S28 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Unknown	UNK	n/a

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
11	4091	432730E 4877301N	S14 T47N R75W	GHS	2010	Good	INAC	n/a
					2009	Excellent	INAC	n/a
					2008	Excellent	INAC	n/a
					2007	Good	ACTI	FEHA
					2006	Fair	INAC	n/a
					2005	Good	ACTI	FEHA
12	4291	425087E 4878320N	S13 T47N R76W	CTL	2009	Fair	INAC	n/a
					2008	Good	INAC	n/a
					2006	Unknown	ACTI	RETA
13	4563	435133E 4876768N	S19 T47N R74W	MMS	2009	Nest Gone	INAC	n/a
					2008	Nest Gone	INAC	n/a
					2007	Good	ACTI	FEHA
14	4567	435127E 4875918N	S19 T47N R74W	MMS	2009	Nest Gone	INAC	n/a
					2008	Nest Gone	INAC	n/a
					2007	Good	ACTI	RETA
15	4568	434920E 4874738N	S25 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Fair	INAC	n/a
					2007	Good	INAC	n/a
16	4569	434898E 4874909N	S25 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Poor	INAC	n/a
					2007	Good	INAC	n/a
17	4570	435166E 4876766N	S19 T47N R74W	GHS	2009	Poor	INAC	n/a
					2008	Remnants	INAC	n/a
					2007	Fair	INAC	n/a
18	4597	431612E 4875238N	S22 T47N R75W	CTL	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Good	INAC	n/a
					2007	Good	ACTI	RETA
19	4705	428665E 4878037N	S16 T47N R75W	CTL	2010	Nest Gone	INAC	n/a
					2009	Unknown	INAC	n/a
					2008	Unknown	UNK	n/a
					2006	Remnants	INAC	n/a

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
20	4707	432836E 4881492N	S2 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Poor	INAC	n/a
					2008	Poor	INAC	n/a
					2007	Fair	INAC	n/a
21	5222	433299E 4880892N	S2 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Unknown	INAC	n/a
					2008	Fair	INAC	n/a
					2007	Good	ACTF	FEHA
22	5863	424951E 4878113N	S13 T47N R76W	CTL	2009	Nest Gone	INAC	n/a
					2008	Fair	INAC	n/a
23	5864	434640E 4875514N	S24 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
					2008	Remnants	INAC	n/a
24	5865	426481E 4878847N	S7 T47N R75W	ACB	2010	Unknown	INAC	n/a
					2009	Unknown	INAC	n/a
					2008	Unknown	INAC	n/a
					2007	Unknown	OCCU	BUOW
					2006	Unknown	ACTI	BUOW
25	5871	426101E 4880067N	S7 T47N R75W	CTL	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Poor	INAC	n/a
26	5873	432717E 4877449N	S14 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
					2008	Remnants	INAC	n/a
					2007	Unknown	OCCU	FEHA
27	5874	432743E 4877587N	S14 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Fair	INAC	n/a
					2007	Unknown	INAC	n/a
28	5875	432498E 4877811N	S14 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
					2008	Remnants	INAC	n/a
29	5876	431028E 4878630N	S10 T47N R75W	GHS	2009	Poor	INAC	n/a
					2008	Unknown	UNK	n/a
30	6059	426481E 4878847N	S7 T47N R75W	ABB	Unknown	Unknown	UNK	n/a

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
31	6357	432663E 4877325N	S14 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Excellent	INAC	n/a
					2008	Good	INAC	n/a
32	6411	425281E 4879170N	S12 T47N R76W	CTL	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
					2008	Fair	INAC	n/a
33	6630	434153E 4874935N	S25 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Good	INAC	n/a
34	8355	425706E 4882278N	S31 T48N R75W	CTD	2010	Fair	INAC	n/a
					2009	Good	INAC	n/a
35	8356	426605E 4881984N	S31 T48N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
36	8358	425315E 4884697N	S25 T48N R76W	CTL	2010	Fair	INAC	n/a
					2009	Good	INAC	n/a
37	8365	424745E 4882172N	S36 T48N R76W	CTL	2010	Nest Gone	INAC	n/a
					2009	Good	INAC	n/a
38	8366	425041E 4882003N	S36 T48N R76W	CTD	2010	Nest Gone	INAC	n/a
					2009	Good	INAC	n/a
39	10272	425287E 4884570N	S25 T48N R76W	JUN	2010	Poor	INAC	n/a
					2009	Good	INAC	n/a
40	10273	426964E 4884427N	S30 T48N R75W	CTL	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
41	10274	426455E 4884392N	S30 T48N R75W	CTL	2010	Substrate Gone	INAC	n/a
					2009	Fair	INAC	n/a
42	10276	426789E 4883998N	S30 T48N R75W	CTL	2010	Poor	INAC	n/a
					2009	Fair	INAC	n/a
43	10277	425391E 4883843N	S25 T48N R76W	CTL	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
44	10279	425631E 4883643N	S30 T48N R75W	CTL	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
45	10282	426371E 4882572N	S31 T48N R75W	ERR	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
46	10283	426606E 4881986N	S31 T48N R75W	ROK	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
47	10284	426617E 4881744N	S31 T48N R75W	GHS	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a

#	BLM ID	UTMs	Legal	Substrate	Year	Condition	Status	Species
48	10285	432863E 4881494N	S2 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
49	10286	433486E 4880823N	S2 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
50	10294	433307E 4876664N	S23 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
51	10297	432796E 4875667N	S23 T47N R75W	GHS	2010	Good	INAC	n/a
					2009	Good	INAC	n/a
52	10298	432957E 4875491N	S23 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
53	10299	434477E 4875167N	S25 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
54	10300	434461E 4875090N	S25 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
55	10301	434381E 4875016N	S25 T47N R75W	GHS	2010	Remnants	INAC	n/a
					2009	Remnants	INAC	n/a
56	10302	429876E 4875005N	S28 T47N R75W	GHS	2010	Fair	INAC	n/a
					2009	Fair	INAC	n/a
57	10303	434150E 4874935N	S25 T47N R75W	GHS	2010	Poor	INAC	n/a
					2009	Poor	INAC	n/a
58	12166	428242E 4877071N	S 17 T47N R75W	GHS	2010	Remnants	INAC	n/a
59	12167	426058E 4883560N	S 30 T48N R75W	CTD	2010	Poor	INAC	n/a
60	12168	433841E 4880625N	S7 T47N R75W	GHS	2010	Fair	INAC	n/a
61	12169	434149E 4880483N	S1 T47N R75W	GHS	2010	Good	INAC	n/a
62	12170	433552E 4876635N	S24T47N R75W	GHS	2010	Remnants	INAC	n/a
63	12171	433307E 4874239N	S 26T47N R75W	MMS	2010	Nest Gone	INAC	n/a
64	12172	427016E 4884392N	S30 T48N R75W	CTL	2010	Nest Gone	INAC	n/a

Notes:
ABB = Abandoned burrow; CTD = Cottonwood - dead; CTL = Cottonwood – live; CKB = Creek bottom; MMS=Man made structure; ROK-Rock outcrop; JUN=Juniper tree; ACB= Active Burrow; GHS=Ground/Hillside
ACTF = Active failed; ACTI = Active; INAC = Inactive
BUOW = Burrowing Owl; FEHA=Ferruginous Hawk; GOEA = Golden Eagle; GRHO = Great horned Owl; RETA = Red-tailed Hawk

Table A.1. Affected Resources Worksheet

Resource	Resource Present	Resource Affected	PRB FEIS Sufficient	Notes
Air quality	Yes	Yes	Yes	See PRB FEIS 3-291, 3-298, 4-404-4-406, 4-377, 4-386.
Cultural	Yes	Yes	No	Analyze in EA.
Native American religious concerns	No	No	No	Analyze in EA.
Traditional Cultural Properties	No	No	No	Analyze in EA.
Mineral Potential	-	-	-	See PRB FEIS 3-66, 3-70, 3-230, 4-127 through 4-129.
Coal	Yes	No	Yes	See PRB FEIS 3-66.
Fluid Minerals	Yes	Yes	Yes	See PRB FEIS 3-68, 3-69.
Locatable Minerals	Yes	No	Yes	Analyze in EA.
Other leasables	Yes	No	Yes	
Salable minerals	Yes	Yes	Yes	
Paleontology				See PRB FEIS 3-65-66, 4-125-127.
PFYC 3	-	-	-	
PFYC 5	-	-	-	
Rangeland management	Yes	Yes	Yes	
Existing range improvements	NA	NA	NA	
Proposed range improvements	NA	NA	NA	
Realty	No	No	NA	
Recreation	Yes	Yes	Yes	See PRB FEIS 3-263, 3-273, 4-319 -4-328.
Developed site	No	No	NA	See PRB FEIS 3-266, 4-326.
Walk-in-Area (2009 data)	No	No	NA	
Social & Economic	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-275-3-289, 4-336-4-370.
Soils & Vegetation	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-80-3-107, 4-134-4-152, 4-153-4-164, 4-343-4-391, 4-406.
Erosion Hazard	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-82, 4-35.
Poor Reclamation Potential	Yes	Yes	No	Analyze in EA.
Slope hazard	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-81, 4-135.
Forest products	Yes	Yes	Yes	
Invasive Species	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-103-3-108, 4-153.
Wetlands/Riparian	Yes	Yes	No	Analyze in EA. See PRB FEIS 3-108-3-111, 4-172-4-178, 4-406, 4-395-4-396.
Special	No	NA	NA	

Table A.1. Affected Resources Worksheet

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

Table A.2. Threatened, Endangered, Proposed, and Candidate Species Worksheet

Common Name	Habitat	Habitat Present?	Individual Presence	Project Effects	Impacts anticipated beyond the level analyzed within the PRB FEIS?
Endangered					
Black-footed ferret	Black-tailed prairie dog colonies or complexes >1,000 acres	No	NP	NE	Northeast Wyoming has been block cleared for presence of black-footed ferret by the USFWS.
Blowout penstemon	Sparsely vegetated, shifting sand dunes	No	NP	NE	Not in FEIS; brief EA treatment required
Threatened					
Ute ladies'-tresses orchid	Riparian areas with permanent water	No	NP	NE	4-253 & BA; brief EA treatment required
Proposed					
Candidate					
Greater sage-grouse	Basin-prairie shrub, mountain-foothill shrub	Yes	K	NJ	4-257 to 4-273; required treatment in EA relative to 12-month finding (USFWS) and recent PRB research

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

Effect Determinations

Listed Species
LAA Likely to adversely affect
NE No Effect.
NLAA May Affect, not likely to adversely affect individuals or habitat.

Candidate Species
J Is likely to jeopardize candidate.
NJ Is not likely to jeopardize candidate species.

Table A.3 Sensitive Species Worksheet

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

Table A.3 Sensitive Species Worksheet

Common Name	Habitat	Habitat Present?	Individual Presence	Project Effects	Direct, Indirect, and/or Cumulative Impacts Anticipated Beyond the Level Analyzed within the PRB FEIS?
Long-billed curlew	Grasslands, plains, foothills, wet meadows	Yes	NS	MIIH	No
Mountain plover	Short-grass prairie with slopes < 5 percent	Yes	NS	MIIH	4-254, 4-255 & BA; EA treatment required
Northern goshawk	Conifer and deciduous forests	No	NP	NI	No
Peregrine falcon	Cliffs	No	NP	NI	No
Sage sparrow	Basin-prairie shrub, mountain-foothill shrub	Yes	NS	MIIH	No
Sage thrasher	Basin-prairie shrub, mountain-foothill shrub	Yes	NS	MIIH	EA treatment required
Trumpeter swan	Lakes, ponds, rivers	No	NP	NI	No
Western Burrowing owl	Grasslands, basin-prairie shrub	Yes	NS	MIIH	No
White-faced ibis	Marshes, wet meadows	No	NP	NI	No
Yellow-billed cuckoo	Open woodlands, streamside willow and alder groves	No	NP	NI	No
Mammals					**4-264 &4-265**
Black-tailed prairie dog	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	Yes	K	MIIH	4-255, 4-256; EA treatment required
Fringed myotis	Conifer forests, woodland chaparral, caves and mines	No	NP	NI	No
Long-eared myotis	Conifer and deciduous forest, caves and mines	No	NP	NI	No
Spotted bat	Cliffs over perennial water.	No	NP	NI	No
Swift fox	Grasslands	YES	S	MIIH	No

Table A.3 Sensitive Species Worksheet

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

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

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

Appendix C. RECLAMATION REQUIREMENTS, WY BLM

The following Reclamation Requirements apply to all surface disturbing activities, including BLM initiated activities, and must be addressed in each reclamation plan. These requirements also must be met prior to release of the bond and/or the reclamation liability. Where these Reclamation Requirements differ from other applicable federal, laws, rules, and regulations, those requirements supersede this policy. State and/or local statutes or regulations may also apply.

1. **Manage all waste materials:**
   a. Segregate, treat, and/or bio-remediate contaminated soil material.
   b. Bury only authorized waste materials on site. Buried material must be covered with a minimum of three feet of suitable material or meet other program standards.
   c. Ensure all waste materials moved off-site are transported to an authorized disposal facility.

2. **Ensure subsurface integrity, and eliminate sources of ground and surface water contamination.**
   a. Properly plug all drill holes and other subsurface openings (mine shafts, adits etc.).
   b. Stabilize, properly back fill, cap, and/or restrict from entry all open shafts, underground workings, and other openings.
   c. Control sources of contamination and implement best management practices to protect surface and ground water quality.

3. **Re-establish slope stability, surface stability, and desired topographic diversity.**
   a. Reconstruct the landscape to the approximate original contour or consistent with the land use plan.
   b. Maximize geomorphic stability and topographic diversity of the reclaimed topography.
   c. Eliminate highwalls, cut slopes, and/or topographic depressions on site, unless otherwise approved.
   d. Minimize sheet and rill erosion on/or adjacent to the reclaimed area. There shall be no evidence of mass wasting, head cutting, large rills or gullies, down cutting in drainages, or overall slope instability on/or adjacent to the reclaimed area.

4. **Reconstruct and stabilize water courses and drainage features.**
   a. Reconstruct drainage basins and reclaim impoundments to maintain the drainage pattern, profile, and dimension to approximate the natural features found in nearby naturally functioning basins.
   b. Reconstruct and stabilize stream channels, drainages, and impoundments to exhibit similar hydrologic characteristics found in stable naturally functioning systems.

5. **Maintain the biological, chemical, and physical integrity of** the **topsoil and subsoil** (where appropriate).
   a. Identify, delineate, and segregate all salvaged topsoil and subsoil based on a site specific soil evaluation, including depth, chemical, and physical characteristics.
   b. Protect all stored soil material from erosion, degradation, and contamination.
   c. Incorporate stored soil material into the disturbed landscape.
   d. Seed soils to be stored beyond one growing season, with desired vegetation.
   e. Identify stockpiles with appropriate signage.

6. **Prepare site for revegetation.**
   a. Redistribute soil materials in a manner similar to the original vertical profile.
   b. Reduce compaction to an appropriate depth (generally below the root zone) prior to redistribution of topsoil, to accommodate desired plant species.
   c. Provide suitable surface and subsurface physical, chemical, and biological properties to support

the long term establishment and viability of the desired plant community.

d. Protect seed and seedling establishment (e.g. erosion control matting, mulching, hydro-seeding, surface roughening, fencing, etc.)

7. **Establish a desired self-perpetuating native plant community.**
   a. Establish species composition, diversity, structure, and total ground cover appropriate for the desired plant community.
   b. Enhance critical resource values (e.g. wildlife, range, recreation, etc.), where appropriate, by augmenting plant community composition, diversity, and/or structure.
   c. Select genetically appropriate and locally adapted native plant materials based on the site characteristics and ecological setting.
   d. Select non-native plants only as an approved short term and non-persistent alternative to native plant materials. Ensure the non-natives will not hybridize, displace, or offer long-term competition to the endemic plants, and are designed to aid in the re-establishment of native plant communities.

8. **Reestablish complementary visual composition**
   a. Ensure the reclaimed landscape features blend into the adjacent area and conform to the land use plan decisions.
   b. Ensure the reclaimed landscape does not result in a long term change to the scenic quality of the area.

9. **Manage Invasive Plants**
   a. Assess for invasive plants before initiating surface disturbing activities.
   b. Develop an invasive plant management plan.
   c. Control invasive plants utilizing an integrated pest management approach.
   d. Monitor invasive plant treatments.

10. **Develop and implement a reclamation monitoring and reporting strategy.**
   a. Conduct compliance and effectiveness monitoring in accordance with a BLM (or other surface management agency) approved monitoring protocol.
   b. Evaluate monitoring data for compliance with the reclamation plan.
   c. Document and report monitoring data and recommend revised reclamation strategies.
   d. Implement revised reclamation strategies as needed.
   e. Repeat the process of monitoring, evaluating, documenting/reporting, and implementing, until reclamation goals are achieved.