FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Williams Production, RMT
Long Draw Unit 2
ENVIRONMENTAL ASSESSMENT –WY-070-**07-208**

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Williams Production, RMT's Long Draw Unit 2 Coal Bed Natural Gas (CBNG) POD comprised of the following 105 Applications for Permit to Drill (APDs):

*****These wells have been analyzed in the EA but are not approved because they have not been posted for the required 30 days which ends on October 12, 2007.

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
1	LONG DRAW 2 LDU	34-9LC	SWSE	9	53N	74W	WYW130791
2	LONG DRAW 2 LDU	34-9WA	SWSE	9	53N	74W	WYW130791
3	LONG DRAW 2 LDU	14-9LC	SWSW	9	53N	74W	WYW130791
4	LONG DRAW 2 LDU	14-9WA	SWSW	9	53N	74W	WYW130791
5	LONG DRAW 2 LDU	14-14LC	SWSW	14	53N	74W	WYW135217
6	LONG DRAW 2 LDU	14-14WA	SWSW	14	53N	74W	WYW135217
7	LONG DRAW 2 LDU	23-14LC	NESW	14	53N	74W	WYW143956
8	LONG DRAW 2 LDU	23-14WA	NESW	14	53N	74W	WYW143956
9	LONG DRAW 2 LDU	32-14LC	SWNE	14	53N	74W	WYW135217
10	LONG DRAW 2 LDU	32-14WA	SWNE	14	53N	74W	WYW135217
11	LONG DRAW 2 LDU	34-14LC	SWSE	14	53N	74W	WYW143956
12	LONG DRAW 2 LDU	34-14WA	SWSE	14	53N	74W	WYW143956
13	LONG DRAW 2 LDU	41-14LC	NENE	14	53N	74W	WYW143956
14	LONG DRAW 2 LDU	41-14WA	NENE	14	53N	74W	WYW143956
15	LONG DRAW 2 LDU	43-14LC	NESE	14	53N	74W	WYW143956
16	LONG DRAW 2 LDU	43-14WA	NESE	14	53N	74W	WYW143956
17	LONG DRAW 2 LDU	12-14LC	SWNW	14	53N	74W	WYW143956
18	LONG DRAW 2 LDU	12-14WA	SWNW	14	53N	74W	WYW143956
19	LONG DRAW 2 LDU	21-15LC	NENW	15	53N	74W	WYW135217
20	LONG DRAW 2 LDU	21-15WA	NENW	15	53N	74W	WYW135217
21	LONG DRAW 2 LDU	34-15LC	SWSE	15	53N	74W	WYW128596
22	LONG DRAW 2 LDU	34-15WA	SWSE	15	53N	74W	WYW128596
23	LONG DRAW 2 LDU	12-15LC	SWNW	15	53N	74W	WYW135217
24	LONG DRAW 2 LDU	12-15WA	SWNW	15	53N	74W	WYW135217
25	LONG DRAW 2 LDU	14-15LC	SWSW	15	53N	74W	WYW128596
26	LONG DRAW 2 LDU	14-15WA	SWSW	15	53N	74W	WYW128596
27	LONG DRAW 2 LDU	32-15LC	SWNE	15	53N	74W	WYW135217
28	LONG DRAW 2 LDU	32-15WA	SWNE	15	53N	74W	WYW135217
29	LONG DRAW 2 LDU	43-15LC	NESE	15	53N	74W	WYW128596
30	LONG DRAW 2 LDU	43-15WA	NESE	15	53N	74W	WYW128596
31	LONG DRAW 2 LDU	12-17LC	SWNW	17	53N	74W	WYW135217
32	LONG DRAW 2 LDU	12-17WA	SWNW	17	53N	74W	WYW135217
33	LONG DRAW 2 LDU	14-17LC	SWSW	17	53N	74W	WYW135217
34	LONG DRAW 2 LDU	14-17WA	SWSW	17	53N	74W	WYW135217
35	LONG DRAW 2 LDU	23-17LC	NESW	17	53N	74W	WYW128596

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
36	LONG DRAW 2 LDU	23-17WA	NESW	17	53N	74W	WYW128596
37	LONG DRAW 2 LDU	32-17LC	SWNE	17	53N	74W	WYW128596
38	LONG DRAW 2 LDU	32-17WA	SWNE	17	53N	74W	WYW128596
39	LONG DRAW 2 LDU	41-17LC	NENE	17	53N	74W	WYW128596
40	LONG DRAW 2 LDU	41-17WA	NENE	17	53N	74W	WYW128596
41	LONG DRAW 2 LDU	43-17LC	NESE	17	53N	74W	WYW128596
42	LONG DRAW 2 LDU	43-17WA	NESE	17	53N	74W	WYW128596
43	LONG DRAW 2 LDU	34-17LC	SWSE	17	53N	74W	WYW128596
44	LONG DRAW 2 LDU	34-17WA	SWSE	17	53N	74W	WYW128596
45	LONG DRAW 2 LDU	11-17LC*	NWNW	17	53N	74W	WYW135217
46	LONG DRAW 2 LDU	11-17WA*	NWNW	17	53N	74W	WYW135217
47	LONG DRAW 2 LDU	32-18LC	SWNE	18	53N	74W	WYW138437
48	LONG DRAW 2 LDU	32-18WA	SWNE	18	53N	74W	WYW138437
49	LONG DRAW 2 LDU	43-18LC	NESE	18	53N	74W	WYW138437
50	LONG DRAW 2 LDU	43-18WA	NESE	18	53N	74W	WYW138437
51	LONG DRAW 2 LDU	21-20LC	NENW	20	53N	74W	WYW143956
52	LONG DRAW 2 LDU	21-20WA	NENW	20	53N	74W	WYW143956
53	LONG DRAW 2 LDU	13-20LC	NWSW	20	53N	74W	WYW128596
54	LONG DRAW 2 LDU	13-20WA	NWSW	20	53N	74W	WYW128596
55	LONG DRAW 2 LDU	23-20WA	NESW	20	53N	74W	WYW128596
56	LONG DRAW 2 LDU	32-20LC	SWNE	20	53N	74W	WYW128596
57	LONG DRAW 2 LDU	32-20WA	SWNE	20	53N	74W	WYW128596
58	LONG DRAW 2 LDU	34-20LC	SWSE	20	53N	74W	WYW128596
59	LONG DRAW 2 LDU	34-20WA	SWSE	20	53N	74W	WYW128596
60	LONG DRAW 2 LDU	41-20LC	NENE	20	53N	74W	WYW128596
61	LONG DRAW 2 LDU	41-20WA	NENE	20	53N	74W	WYW128596
62	LONG DRAW 2 LDU	43-20LC	NESE	20	53N	74W	WYW128596
63	LONG DRAW 2 LDU	43-20WA	NESE	20	53N	74W	WYW128596
64	LONG DRAW 2 LDU	12-21LC	SWNW	21	53N	74W	WYW143956
65	LONG DRAW 2 LDU	12-21WA	SWNW	21	53N	74W	WYW143956
66	LONG DRAW 2 LDU	14-21LC	SWSW	21	53N	74W	WYW128596
67	LONG DRAW 2 LDU	14-21WA	SWSW	21	53N	74W	WYW128596
68	LONG DRAW 2 LDU	23-21LC	NESW	21	53N	74W	WYW128596
69	LONG DRAW 2 LDU	23-21WA	NESW	21	53N	74W	WYW128596
70	LONG DRAW 2 LDU	32-21LC	SWNE	21	53N	74W	WYW143562
71	LONG DRAW 2 LDU	32-21WA	SWNE	21	53N	74W	WYW143562
72	LONG DRAW 2 LDU	43-21LC	NESE	21	53N	74W	WYW128596
73	LONG DRAW 2 LDU	43-21WA	NESE	21	53N	74W	WYW128596
74	LONG DRAW 2 LDU	42-21LC*	SENE	21	53N	74W	WYW143562
75	LONG DRAW 2 LDU	42-21WA*	SENE	21	53N	74W	WYW143562
76	LONG DRAW 2 LDU	12-22LC	SWNW	22	53N	74W	WYW143563
77	LONG DRAW 2 LDU	12-22WA	SWNW	22	53N	74W	WYW143563
78	LONG DRAW 2 LDU	21-22LC	NENW	22	53N	74W	WYW143563
79	LONG DRAW 2 LDU	21-22WA	NENW	22	53N	74W	WYW143563
80	LONG DRAW 2 LDU	23-22LC	NESW	22	53N	74W	WYW143563

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
81	LONG DRAW 2 LDU	23-22WA	NESW	22	53N	74W	WYW143563
82	LONG DRAW 2 LDU	32-22LC	SWNE	22	53N	74W	WYW134219
83	LONG DRAW 2 LDU	32-22WA	SWNE	22	53N	74W	WYW134219
84	LONG DRAW 2 LDU	43-22LC	NESE	22	53N	74W	WYW134219
85	LONG DRAW 2 LDU	43-22WA	NESE	22	53N	74W	WYW134219
86	LONG DRAW 2 LDU	41-22LC	NENE	22	53N	74W	WYW134219
87	LONG DRAW 2 LDU	41-22WA	NENE	22	53N	74W	WYW134219
88	LONG DRAW 2 LDU	44-22LC*	SESE	22	53N	74W	WYW134219
89	LONG DRAW 2 LDU	44-22WA*	SESE	22	53N	74W	WYW134219
90	LONG DRAW 2 LDU	12-23LC	SWNW	23	53N	74W	WYW143956
91	LONG DRAW 2 LDU	12-23WA	SWNW	23	53N	74W	WYW143956
92	LONG DRAW 2 LDU	14-23LC	SWSW	23	53N	74W	WYW143563
93	LONG DRAW 2 LDU	14-23WA	SWSW	23	53N	74W	WYW143563
94	LONG DRAW 2 LDU	23-23LC	NESW	23	53N	74W	WYW143563
95	LONG DRAW 2 LDU	23-23WA	NESW	23	53N	74W	WYW143563
96	LONG DRAW 2 LDU	43-23LC	NESE	23	53N	74W	WYW143563
97	LONG DRAW 2 LDU	43-23WA	NESE	23	53N	74W	WYW143563
98	LONG DRAW 2 LDU	33-23LC*	NWSE	23	53N	74W	WYW143563
99	LONG DRAW 2 LDU	33-23WA*	NWSE	23	53N	74W	WYW143563
100	LONG DRAW 2 LDU	14-24LC	SWSW	24	53N	74W	WYW135217
101	LONG DRAW 2 LDU	14-24WA	SWSW	24	53N	74W	WYW135217
102	LONG DRAW 2 LDU	21-24LC	NENW	24	53N	74W	WYW135217
103	LONG DRAW 2 LDU	21-24WA	NENW	24	53N	74W	WYW135217
104	LONG DRAW 2 LDU	41-28LC	NENE	28	53N	74W	WYW134219
105	LONG DRAW 2 LDU	41-28WA	NENE	28	53N	74W	WYW134219

The following impoundments were inspected and approved for use in association with the water management strategy for the POD. Dams listed as secondary will not require bonding prior to plan approval, but, should the decision be made to construct them, a sundry will need to be submitted to BLM for review and approval.

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
1	LONG DRAW ENLARGEMENT	NWSE	20	53	74	42.1	4.7	WYW-128596
2	RANGLE ENLARGEMENT	NWSE	13	53	74	5.9	1.4	FEE
3	FIELD	NWSW	18	53	73	1.2	0.9	FEE
4	JACOB	NESE	17	53	74	13	2.7	WYW-128596
5	KIRK #2	SWSW	23	53	74	12	4	WYW-135217
6	MIDDLE PRONG	NWNW	16	53	74	4.7	2.4	STATE
7	MILLIE LAFLEUR	NWSW	13	53	74	16.5	2.9	WYW-144514
8	SCOTT 11-28-5374	NWNW	28	53	74	9.3	1.8	FEE
9	SCOTT 22-21-5374	SENW	21	53	74	1.4	1	WYW-143956
10	STACKYARD	NWSW	24	53	74	2.3	1.2	FEE

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
11	13-24-T53N R74W	SWSE	13	53	74	10.4	3.6	FEE
12	23-21-T53N R74W	NWNE	23	53	74	11.8	4.1	FEE
13	24-9A-T53N R74W	NESE	24	53	74	4.6	2.7	FEE
14	JOHNSON #2--secondary	SESE	22	53	74	2.1	1	WYW-134219
15	SCOTT 14-21-5374--secondary	SWSW	21	53	74	3.5	1	WYW-128596
16	SCOTT 13-09-5374--secondary	NWSW	9	53	74	9.1	2	WYW-130791

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

RATIONALE: The decision to authorize Alternative C, as described in the attached Environmental Assessment (EA), is based on the following:

1. The Operator, in their POD, has committed to:
    - Comply with all applicable Federal, State and Local laws and regulations.
    - 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.
    - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD.
    - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowner(s).
3. Alternative C will not result in any undue or unnecessary environmental degradation.
4. It is in the public interest to approve these wells, as the leases are being drained of federal gas, resulting in a loss of revenue for the government.
5. Mitigation measures applied by the BLM will alleviate or minimize environmental impacts.
6. Alternative C is the environmentally-preferred Alternative.
7. The proposed action is in conformance with the PRB FEIS and the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management (BLM), Buffalo Field Office, April 2001.

FINDING OF NO SIGNIFICANT IMPACT: Based on the analysis of the potential environmental impacts, I have determined that NO significant impacts are expected from the implementation of Alternative C and, therefore, an environmental impact statement is not required.

ADMINISTRATIVE REVIEW AND APPEAL: Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including

all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received.

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

Field Manager:_____ Date: _____

BUREAU OF LAND MANAGEMENT
BUFFALO FIELD OFFICE
ENVIRONMENTAL ASSESSMENT (EA)
FOR
Williams Production, RMT
Long Draw Unit 2
PLAN OF DEVELOPMENT
WY-070-07-208

INTRODUCTION

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

1. PURPOSE AND NEED

The purpose for the proposal is to define and produce coal bed natural gas (CBNG) on 8 federal oil and gas mineral leases issued to the applicant by the BLM. Analysis has determined that federal CBNG is being drained from the federal leases by surrounding fee or state mineral well development. The need exists because without approval of the Applications for Permit to Drill (APDs), federal lease royalties will be lost and the lessee will be deprived of the federal gas they have the rights to develop.

1.1. Conformance with Applicable Land Use Plan and Other Environmental Assessments:

The proposed action is in conformance with the terms and the conditions of the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management, Buffalo Field Office (BFO), April 2001 and the PRB FEIS, as required by 43 CFR 1610.5

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative A - No Action

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

2.2. Alternative B Proposed Action

Proposed Action Title/Type: Williams Production, RMT's Long Draw Unit 2 Plan of Development (POD) for 117 coal bed natural gas well APD`s and associated infrastructure.

Proposed Well Information: There are 117 wells proposed within this POD, the wells are vertical bores proposed on an 80 acre spacing pattern with 2 wells per location. Each well will produce from one coal seam, one from the Lower Canyon (LC) and the other from the Wall (WA). Wells are located as follows:

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
1	LONG DRAW 2 LDU	34-9LC	SWSE	9	53N	74W	WYW130791
2	LONG DRAW 2 LDU	34-9WA	SWSE	9	53N	74W	WYW130791
3	LONG DRAW 2 LDU	14-9LC*	SWSW	9	53N	74W	WYW130791
4	LONG DRAW 2 LDU	14-9WA	SWSW	9	53N	74W	WYW130791
5	LONG DRAW 2 LDU	14-14LC	SWSW	14	53N	74W	WYW135217
6	LONG DRAW 2 LDU	14-14WA	SWSW	14	53N	74W	WYW135217
7	LONG DRAW 2 LDU	23-14LC	NESW	14	53N	74W	WYW143956
8	LONG DRAW 2 LDU	23-14WA	NESW	14	53N	74W	WYW143956
9	LONG DRAW 2 LDU	32-14LC	SWNE	14	53N	74W	WYW135217
10	LONG DRAW 2 LDU	32-14WA	SWNE	14	53N	74W	WYW135217
11	LONG DRAW 2 LDU	34-14LC	SWSE	14	53N	74W	WYW143956
12	LONG DRAW 2 LDU	34-14WA	SWSE	14	53N	74W	WYW143956
13	LONG DRAW 2 LDU	41-14LC	NENE	14	53N	74W	WYW143956
14	LONG DRAW 2 LDU	41-14WA	NENE	14	53N	74W	WYW143956
15	LONG DRAW 2 LDU	43-14LC	NESE	14	53N	74W	WYW143956
16	LONG DRAW 2 LDU	43-14WA	NESE	14	53N	74W	WYW143956
17	LONG DRAW 2 LDU	12-14LC	SWNW	14	53N	74W	WYW143956
18	LONG DRAW 2 LDU	12-14WA	SWNW	14	53N	74W	WYW143956
19	LONG DRAW 2 LDU	21-15LC	NENW	15	53N	74W	WYW135217
20	LONG DRAW 2 LDU	21-15WA	NENW	15	53N	74W	WYW135217
21	LONG DRAW 2 LDU	34-15LC	SWSE	15	53N	74W	WYW128596
22	LONG DRAW 2 LDU	34-15WA	SWSE	15	53N	74W	WYW128596
23	LONG DRAW 2 LDU	12-15LC	SWNW	15	53N	74W	WYW135217
24	LONG DRAW 2 LDU	12-15WA	SWNW	15	53N	74W	WYW135217
25	LONG DRAW 2 LDU	14-15LC	SWSW	15	53N	74W	WYW128596
26	LONG DRAW 2 LDU	14-15WA	SWSW	15	53N	74W	WYW128596
27	LONG DRAW 2 LDU	32-15LC	SWNE	15	53N	74W	WYW135217
28	LONG DRAW 2 LDU	32-15WA	SWNE	15	53N	74W	WYW135217
29	LONG DRAW 2 LDU	43-15LC	NESE	15	53N	74W	WYW128596
30	LONG DRAW 2 LDU	43-15WA	NESE	15	53N	74W	WYW128596
31	LONG DRAW 2 LDU	12-17LC	SWNW	17	53N	74W	WYW135217
32	LONG DRAW 2 LDU	12-17WA	SWNW	17	53N	74W	WYW135217
33	LONG DRAW 2 LDU	14-17LC	SWSW	17	53N	74W	WYW135217
34	LONG DRAW 2 LDU	14-17WA	SWSW	17	53N	74W	WYW135217
35	LONG DRAW 2 LDU	23-17LC	NESW	17	53N	74W	WYW128596
36	LONG DRAW 2 LDU	23-17WA	NESW	17	53N	74W	WYW128596
37	LONG DRAW 2 LDU	32-17LC	SWNE	17	53N	74W	WYW128596
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42	LONG DRAW 2 LDU	43-17WA	NESE	17	53N	74W	WYW128596
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50	LONG DRAW 2 LDU	43-18WA	NESE	18	53N	74W	WYW138437
51	LONG DRAW 2 LDU	21-20LC	NENW	20	53N	74W	WYW143956
52	LONG DRAW 2 LDU	21-20WA	NENW	20	53N	74W	WYW143956
53	LONG DRAW 2 LDU	13-20LC	NWSW	20	53N	74W	WYW128596
54	LONG DRAW 2 LDU	13-20WA	NWSW	20	53N	74W	WYW128596
55	LONG DRAW 2 LDU	23-20WA	NESW	20	53N	74W	WYW128596
56	LONG DRAW 2 LDU	32-20LC	SWNE	20	53N	74W	WYW128596
57	LONG DRAW 2 LDU	32-20WA	SWNE	20	53N	74W	WYW128596
58	LONG DRAW 2 LDU	34-20LC	SWSE	20	53N	74W	WYW128596
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61	LONG DRAW 2 LDU	41-20WA	NENE	20	53N	74W	WYW128596
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73	LONG DRAW 2 LDU	43-21WA	NESE	21	53N	74W	WYW128596
74	LONG DRAW 2 LDU	41-21LC	SENE	21	53N	74W	WYW143562
75	LONG DRAW 2 LDU	41-21WA	SENE	21	53N	74W	WYW143562
76	LONG DRAW 2 LDU	12-22LC	SWNW	22	53N	74W	WYW143563
77	LONG DRAW 2 LDU	12-22WA	SWNW	22	53N	74W	WYW143563
78	LONG DRAW 2 LDU	21-22LC	NENW	22	53N	74W	WYW143563
79	LONG DRAW 2 LDU	21-22WA	NENW	22	53N	74W	WYW143563
80	LONG DRAW 2 LDU	23-22LC	NESW	22	53N	74W	WYW143563
81	LONG DRAW 2 LDU	23-22WA	NESW	22	53N	74W	WYW143563
82	LONG DRAW 2 LDU	32-22LC	SWNE	22	53N	74W	WYW134219
83	LONG DRAW 2 LDU	32-22WA	SWNE	22	53N	74W	WYW134219
84	LONG DRAW 2 LDU	43-22LC	NESE	22	53N	74W	WYW134219
85	LONG DRAW 2 LDU	43-22WA	NESE	22	53N	74W	WYW134219
86	LONG DRAW 2 LDU	41-22LC	NENE	22	53N	74W	WYW134219
87	LONG DRAW 2 LDU	41-22WA	NENE	22	53N	74W	WYW134219
88	LONG DRAW 2 LDU	34-22LC	SESE	22	53N	74W	WYW134219
89	LONG DRAW 2 LDU	34-22WA	SESE	22	53N	74W	WYW134219
90	LONG DRAW 2 LDU	12-23LC	SWNW	23	53N	74W	WYW143956
91	LONG DRAW 2 LDU	12-23WA	SWNW	23	53N	74W	WYW143956
92	LONG DRAW 2 LDU	14-23LC	SWSW	23	53N	74W	WYW143563

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
93	LONG DRAW 2 LDU	14-23WA	SWSW	23	53N	74W	WYW143563
94	LONG DRAW 2 LDU	23-23LC	NESW	23	53N	74W	WYW143563
95	LONG DRAW 2 LDU	23-23WA	NESW	23	53N	74W	WYW143563
96	LONG DRAW 2 LDU	43-23LC	NESE	23	53N	74W	WYW143563
97	LONG DRAW 2 LDU	43-23WA	NESE	23	53N	74W	WYW143563
98	LONG DRAW 2 LDU	34-23LC	NWSE	23	53N	74W	WYW143563
99	LONG DRAW 2 LDU	34-23WA	NWSE	23	53N	74W	WYW143563
100	LONG DRAW 2 LDU	14-24LC	SWSW	24	53N	74W	WYW135217
101	LONG DRAW 2 LDU	14-24WA	SWSW	24	53N	74W	WYW135217
102	LONG DRAW 2 LDU	21-24LC	NENW	24	53N	74W	WYW135217
103	LONG DRAW 2 LDU	21-24WA	NENW	24	53N	74W	WYW135217
104	LONG DRAW 2 LDU	41-28LC	NENE	28	53N	74W	WYW134219
105	LONG DRAW 2 LDU	41-28WA	NENE	28	53N	74W	WYW134219
106	LONG DRAW 2 LDU	13-15LC	NWSW	15	53N	74W	WYW128596
107	LONG DRAW 2 LDU	41-15LC	NENE	15	53N	74W	WYW135217
108	LONG DRAW 2 LDU	41-15WA	NENE	15	53N	74W	WYW135217
109	LONG DRAW 2 LDU	14-20LC	SWSW	20	53N	74W	WYW128596
110	LONG DRAW 2 LDU	14-20WA	SWSW	20	53N	74W	WYW128596
111	LONG DRAW 2 LDU	23-20LC	NESW	20	53N	74W	WYW128596
112	LONG DRAW 2 LDU	22-21LC	SENW	21	53N	74W	WYW143956
113	LONG DRAW 2 LDU	22-21WA	SENW	21	53N	74W	WYW143956
114	LONG DRAW 2 LDU	14-22LC	SWSW	22	53N	74W	WYW143563
115	LONG DRAW 2 LDU	14-22WA	SWSW	22	53N	74W	WYW143563
116	LONG DRAW 2 LDU	21-29LC	NENW	29	53N	74W	WYW143564
117	LONG DRAW 2 LDU	21-29WA	NENW	29	53N	74W	WYW143564

Water Management Proposal: The following impoundments were proposed for use in association with the water management strategy for the POD.

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
1	LONG DRAW ENLARGEMENT	NWSE	20	53	74	42.1	4.7	WYW-128596
2	RANGLE ENLARGEMENT	NWSE	13	53	74	5.9	1.4	FEE
3	FIELD	NWSW	18	53	73	1.2	0.9	FEE
4	JACOB	NESE	17	53	74	13	2.7	WYW-128596
5	KIRK #2	SWSW	23	53	74	12	4	WYW-135217
6	MIDDLE PRONG	NWNW	16	53	74	4.7	2.4	STATE
7	MILLIE LAFLEUR	NWSW	13	53	74	16.5	2.9	WYW-144514
8	SCOTT 11-28-5374	NWNW	28	53	74	9.3	1.8	FEE
9	SCOTT 22-21-5374	SENW	21	53	74	1.4	1	WYW-143956
10	STACKYARD	NWSW	24	53	74	2.3	1.2	FEE
11	13-24-T53N R74W	SWSE	13	53	74	10.4	3.6	FEE
12	23-21-T53N R74W	NWNE	23	53	74	11.8	4.1	FEE
13	24-9A-T53N R74W	NESE	24	53	74	4.6	2.7	FEE
14	Hill #1 Enlargement	SENE	16	53	74	19.8	4.7	STATE

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
15	Homestead	SWSW	22	53	74	1.8	0.7	WYW-143563
16	JOHNSON CORRAL	NWSW	23	53	74	1.25	0.4	WYW-143563

The following impoundments have been designated as Secondary by the operator. These impoundments will not require reclamation bonds prior to POD approval. However, should the operator decide to construct these impoundments, a sundry will be submitted to the BLM Authorized Officer for approval, along with verification of reclamation bond submittal.

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
1	JOHNSON #2--secondary	SESE	22	53	74	2.1	1	WYW-134219
2	SCOTT 14-21-5374--secondary	SWSW	21	53	74	3.5	1	WYW-128596
3	SCOTT 13-09-5374--secondary	NWSW	9	53	74	9.1	2	WYW-130791

County: Campbell

Applicant: Williams Production, RMT

Surface Owners: Bill Butcher, Marion & Mary Scott, Dudley & Marilyn Mackey, State of Wyoming, and the Bureau of Land Management

Project Description:
The proposed action involves the following:

- Drilling of 117 total federal CBM wells, 59 wells in the Lower Canyon (LC) and 58 wells in the Wall (WA) coal zones to depths of approximately 1071 feet for the LC wells and 1366 feet for WA wells. Multiple seams will be produced by co-locating wells (multiple wells at a single location each targeting a single formation).

  Drilling and construction activities are anticipated to be completed within two years, the term of an APD. Drilling and construction occurs year-round in the PRB. Weather may cause delays lasting several days but rarely do delays last multiple weeks. Timing limitations in the form of COAs and/or agreements with surface owners may impose longer temporal restrictions on portions of this POD, but rarely do these restrictions affect an entire POD.

- Well metering will be accomplished by telemetry and a central metering facility. Metering would entail 4 visits per month to each well.

- A Water Management Plan (WMP) that involves the following infrastructure and strategy: 7 discharge points and 7 stock water reservoirs within the Upper Powder River watershed and 9 discharge points and 9 stock water reservoirs within the Little Powder River watershed.

- An unimproved and improved road network.

- An above ground power line network to be constructed by a contractor. The proposed route has been reviewed by the contractor. If the proposed route is altered, then the new route will be

proposed via sundry application and analyzed in a separate NEPA action. Power line construction has not been scheduled and will not be completed before the CBNG wells are producing. If the power line network is not completed before the wells are in production, then temporary diesel generators shall be placed at the 8 power drops.

A storage tank of 1000 gallon capacity shall be located with each diesel generator. Generators are projected to be in operation for up to 12 months. Fuel deliveries are anticipated to be once per week. Noise level is expected to be between 54.4 and 76.2 decibels at 100 feet distance, depending on the size of the generator. The range of power produced by the generators is between 60 and 300 kilowatts.

- A buried gas, water and power line network, and 1 central gathering/metering facilities.

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

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

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

1. Comply with all applicable Federal, State and Local laws and regulations.
2. Obtain the necessary permits for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
3. Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD
4. Provide water analysis from a designated reference well in each coal zone.

The Operator has certified that a Surface Use Agreement has been reached with the Landowners.

2.3. Alternative C – Environmentally Preferred

Alternative C represents a modification of Alternative B based on the operator and BLM working cooperatively to reduce environmental impacts. The description of Alternative C is the same as Alternative B with the addition of the project modifications identified by BLM and the operator following the initial project proposal (Alternative B). At the on-sites, all areas of proposed surface disturbance were inspected to insure that the project would meet BLM multiple use objectives to conserve natural resources while allowing for the extraction of Federal minerals. In some cases, access roads were re-routed, and well locations, pipelines, discharge points and other water management control structures were moved, modified, mitigated or dropped from further consideration to alleviate environmental impacts. Alternatives to the different aspects of the proposed action are always considered and applied as pre-approval changes, site specific mitigation and/or Conditions of Approval (COAs), if they will alleviate environmental effects of the operator's proposal. The specific changes identified for the Long Draw Unit 2 POD are listed below under 2.3.1:

2.3.1. Changes as a result of the on-sites

Well Location	Surface	Road	Wildlife
14-9-5374 LC & WA	Wells moved down to saddle in ridge line ~300yds SW due to a better reclamation potential, Slot Location	Road moved to come up the ridge from the drainage for easier access (template road ok), LWC needed, drill rigs will come from 2-track on Kretchman's surface	Kestrel Nest. TLS for wells and road. minimize mowing on access and location (Mowing Diagram)
34-9-5374 LC & WA	Slot location	down scoria bluff, spot upgrade and turnout needed at the top	minimize mowing on access and location (Mowing Diagram)
12-14-5374 LC & WA	wells moved down to bench above drainage closer to the main road, slot location	engineered road	minimize mowing on access and location (Mowing Diagram)
23-14-5374 LC & WA	no slot or pad, will use pit dirt to level if necessary	no changes	
32-14-5374 LC & WA	no changes	road moved to along fence and up low and wide ridge to avoid crossing drainage	
34-14-5374 LC & WA	No Pad, slot location		
41-14-5374 LC & WA	no changes, pipeline will follow access, minimal dirt work at landowners request	Engineered spot 16% max grade upgrade on two-track road above and below upgraded section. Utilize existing two track.	
43-14-5374 LC & WA	slot location	LWC needed along fence line	minimize mowing on access and location
12-15-5374 LC & WA	moved ~350' from where the 13-15 well was staked up the ridge closer to main road and in area of less dense sagebrush	Along ridge to avoid disturbance to sagebrush	
13-15-5374 LC	Williams dropped location due to drainage issues		
14-15-5374 LC & WA	moved wells ~100' E to flatter location that can be slotted	Ok to template road to well. Stay next to fence line around bottom of hill	
32-15-5374 LC & WA	Wells were moved ~20 feet downhill, Slot location instead of Pad, utilizing the road and existing pipeline disturbance for drilling phase		
34-15-5374 LC & WA	Slot location instead of pad, road and pipeline through drainage	Road to 41-22 well will come from this location crossing drainage bottom to the east	minimize mowing on access and location (Mowing Diagram)

Well Location	Surface	Road	Wildlife
41-15-5374 LC & WA	Dropped due to excessive disturbance for access road, highly erosive soils and +25% slopes, and for lack of ability to reclaim		
43-15-5374 LC & WA	slid wells to the north to avoid erosive soils and slopes, keep spoils from going over ridge to west, staking did not match design		
12-17-5374 LC & WA	Slot instead of pad	LWC through drainage crossing	minimize mowing on access and location (Mowing Diagram)
14-17-5374 LC & WA	25' vegetative buffer from edge of drainage, lined pit	access moved to come out of drainage and go on the flat bench on west side of drainage, the section of road climbing out of drainage needs engineering, once on top it will curve around some headcuts and pass below a spreader dike, then continue to the next well, avoiding splitting the large stands of sagebrush	minimize mowing on access and location (Mowing Diagram)
21-17-5374 LC & WA	Wells moved to a slot location between the original proposed location and where it was first moved at the onsite at landowner's wishes, landowner wants a tire tank here, Changed Name to **11-17 location**.	Road changed since onsite due to Landowner request,	minimize mowing on access
23-17-5374 LC & WA	no changes	no changes	minimize mowing on access and location (Mowing Diagram)
32-17-5374 LC & WA	Slot instead of pad		
34-17-5374 LC & WA	moved to opposite side of drainage where the soils are better, and where landowner preferred, pad location ok	road moved to opposite side of drainage to a better grade and side slope and better soils and where landowner preferred, still requires engineering, road will go to drainage bottom but pipeline will stop at existing pipeline and follow it to the next location	

Well Location	Surface	Road	Wildlife
41-17-5374 LC & WA	slot location	access for rigs from existing 2-track off of Kretschman's property, pumper access will still come from proposed direction, may need engineered spot upgrade to maintain 16% grade	
43-17-5374 LC & WA	no changes	road changed to come around hill rather than up it, pretty good side slope to road and near some headcuts, template road	minimize mowing on access and location (Mowing Diagram)
32-18-5374 LC & WA	wells moved downhill to a flatter area and avoids putting on steeper slopes, slot location instead of pad	road changed up from bottom instead of from top	Kestrel nest in area - TLS. Minimize mowing
43-18-5374 LC & WA	swing WA well around to East side of LC to get a little further away from Kestrel Nest, landowner would like water tank here	road will be where there is openings in the stand of sagebrush	Kestrel nest - TLS. Minimize mowing
13-20-5374 LC & WA	shown as the 23-20 on the map, moved to shallow bowl off of existing pipeline to avoid the need of a pad, slot location, pipeline will follow existing pipeline	road changed to follow existing pipeline except where the slope increases and will need to cross up the hill, template road along pipeline ok, needs engineering where staked, Section that crosses pipeline before well location will need redesigned, stakes will be checked a pre-construction	
14-20-5374 LC & WA	Dropped due to excessive disturbance for access road, and move of 13-20 well makes it too close as far as drainage		
21-20-5374 LC & WA	slot location, pit downhill	engineered road, crosses main drainage, LWC or culvert(s) needed	minimize mowing on access and location (Mowing Diagram)
23-20-5374 LC & WA	shown as the 13-20 on map, changed to a single well location, also needs a turnaround incorporated so that trucks can make it back down the hill	Out slope template proposed - ok	
32-20-5374 LC & WA	moved across drainage, to avoid an engineered road, slot location	road will follow existing pipeline and pipeline will be corridored with it	

Well Location	Surface	Road	Wildlife
34-20-5374 LC & WA	slot design instead of pad, moved wells ~500' to a less steep area and less sagebrush	needs engineered road, rerouted to come from Long Draw impoundment and will follow cow trail up to well location	minimize mowing on access and location (Mowing Diagram)
41-20-5374 LC & WA	moved ~420' to other side of ridge and will be incorporated into the road, pad will be needed, this avoids good sagebrush and now requires less road	road will come from 34-17 well location around knob and up to and across ridge to a side cut road, which needs to be engineered and avoid headcuts, see diagram and description below	
43-20-5374 LC & WA	moved ~300' East to a location where a pad will not be required, slot location instead, pipeline will follow existing pipeline disturbance	road will be along existing 2-track	
12-21-5374 LC & WA	Slot instead of pad	engineered road	
22-21-5374 LC & WA	Dropped due to raptor nest within 1/4 mile and Line-of-Sight, also the pad would have needed large cuts and fills and access would be difficult and no pad design was submitted		
23-21-5374 LC & WA	Slot instead of pad	improved road with spot upgrades, instead of engineering	
32-21-5374 LC & WA	no changes	2-track instead of improved	
41-21-5374 LC & WA	Williams moved location to be next to road (landowner preference), no slot or pad, changed name to 42-21 location		
12-22-5374 LC & WA	no changes, lined pit	access changed to 2-track from improved	
14-22-5374 LC & WA	Dropped well due to road, 16% grade for over 1200 feet with 30+ foot of cuts	engineered road on steep slope, tough access	

Well Location	Surface	Road	Wildlife
21-22-5374 LC & WA	avoid highly erosive knob	Road moved back to original location, template for entire road, will cross narrow drainage at the top instead of paralleling it and will avoid and cutting into knob where road goes around and to the locations, near main road the access will follow fence line	minimize mowing on access
32-22-5374 LC & WA	minimize disturbance due to erosive soils	road adjusted to access location on east end of erosive knob, utilizing the natural topography, engineered road	
34-22-5374 LC & WA	moved wells ~350' to East to avoid kestrel nest Line-of-Sight, slot location, change name to 44-22 location	30 day COA for reclamation, idea to use 2-track and gravel the tracks, no engineering	minimize mowing on access
41-22-5374 LC & WA	moved wells downhill ~150', pipeline and road will now come from the 34-15 well location, pad design ok	Road changed to come from the road to the 34-15 well location	
43-22-5374 LC & WA	no changes		minimize mowing on access and location (Mowing Diagram)
12-23-5374 LC & WA	slot location, going to need to work around/fill in the old washed out cow/buffalo trail next to wells, pit moved out of existing pipeline disturbance		minimize mowing on access
14-23-5374 LC & WA	slot location	avoid headcuts	
23-23-5374 LC & WA	slot location instead of pad		minimize mowing on access and location (Mowing Diagram)
34-23-5374 LC & WA	moved ~100' onto old reclaimed oil pad, well will change to a 33 well location, slot location, changed name to a 33-23 location		
14-24-5374 LC & WA	no changes	road over old dam to cross drainage, will need to be enlarged and possibly need a LWC through a spillway or culvert through dam	
21-24-5374 LC & WA	slot location, COA to reclaim location within 30 days due to erosive soils	probably will need water bars	

Well Location	Surface	Road	Wildlife
41-28-5374 LC & WA	slot location instead of pad, pipeline to come from fee well location	main road passes over a highly erosive hill, this section will be covered with crushed rock., do not turn soil over	
21-29-5374 LC & WA	Dropped due to excessive disturbance for access road, highly erosive soils and +25% slopes		
Other			
Road between 41-28 and 14-21	pipeline to follow road	moved off of ridge to avoid erosive soils and steep slopes, template road	

Water Management

IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Remarks for damsite
JACOB	NESE	17	53	74	13	This was an old existing structure which has failed. It will be completely re-built.
KIRK #2	SWSW	23	53	74	12	Old existing dam. May require some maintenance to bring it up to snuff.
MIDDLE PRONG	NWNW	16	53	74	4.7	Old existing dam. Will require some maintenance.
SCOTT 11-28-5374	NWNW	28	53	74	9.3	Old existing damsite. Operator plans to build a new dam about 100' downstream. There is a springy area on the left gully embankment downstream of site. There is potential that this could lead to a seepage path. No obvious seepage just below existing dam. Gully further downstream has a lot of foxtail barley, which indicates presence of water for at least some times of the year. No changes.
SCOTT 22-21-5374	SENW	21	53	74	1.4	Old existing dam which washed out and was re-built in the 90's. No changes at onsite.
STACKYARD	NWSW	24	53	74	2.3	Old existing dam. May require some maintenance. No changes at onsite.
23-21-T53N R74W	NWNE	23	53	74	11.8	Old existing dam. Will require addition of a low-level outlet in order to satisfy the Wildcat Creek agreement.
JOHNSON CORRAL--dropped	NWSW	23	53	74	1.25	Old existing dam in close proximity to an old homesteader's dugout. Very small capacity. Landowner would prefer this one not be built because, as staked, the emergency spillway would take out what is left of the dugout.
JOHNSON #2	SESE	22	53	74	2.1	Old existing dam. There will be no changes to the pool area and reservoir capacity. However, a road is proposed to cross over the dam which will require widening the top. It is recommended that, where the road crosses the emergency spillway, a LWC be used without culverts.
SCOTT 14-21-5374	SWSW	21	53	74	3.5	This proposed dam is in a steep, narrow gully. There is foxtail barley in the larger

IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Remarks for damsite
						draw downstream. There are active headcuts moving upstream towards the damsite. Sandstone and coal outcrops were visible downstream of site which would very likely provide rapid seepage or piping failure pathways for stored water. The operator has chosen to list this dam as a secondary. If it is built, construction oversight will be required so that problems which might compromise the integrity of the structure can be identified and remedied or the site abandoned at that time. The operator has designated this as a "secondary" structure.
SCOTT 13-09-5374	NWSW	9	53	74	9.1	Old failed dam just above the Elizabeth #1 Spring. At the time of the onsite, the landowner was ambivalent about whether or not to re-habilitate this site. The operator has chosen to list this dam as a secondary.
Hill #1 Enlargement	SENE	16	53	74	19.8	This off-channel impoundment is located in a depression atop a highland area. It is not a "blowout" or a bonafide "playa". It may be a subsidence feature at the top of a scoria hill. There is potential that water impounded here could rapidly and adversely affect groundwater wells within a very large area and/or crop out around the base of this highland. Wildlife concerns also affect the choice of this location. During onsite visits, the landowner expressed a desire to NOT have this pit constructed. A discussion with Wyoming wildlife and land management agencies is ongoing, since this location is on State land. This impoundment and associated outfall have been dropped from the plan by the operator.
Homestead	SWSW	22	53	74	1.8	This old existing dam is at the bottom of a relatively steep, deep draw. There is a 10-20 foot headcut immediately downstream of the dam. Soils are highly erosive and prone to piping. There is a very high probability of dam failure. Therefore, it will not be included as part of the federal proposal and has been dropped by the operator.

The following impoundments were proposed with the operator's plan of development, but will not receive produce water from federal wells for the following reasons:

- Homestead—because of a significant headcut immediately downstream of the dam, highly erosive soils, and a high probability of failure.

- Hill #1 Enlargement—because of the presence of sage-grouse sign and the geology of the area which indicates that water impounded at this location will infiltrate rapidly into the substrate and subsequently rapidly affect groundwater wells in the area.

- Johnson Corral—dropped by the operator according to the landowner's wishes because of the presence of the remnants of an old homestead "dugout" dwelling which would be removed by the

proposed emergency spillway.

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturbance (Acres)	Lease #
1	Hill #1 Enlargement	SENE	16	53	74	19.8	4.7	STATE
2	Homestead	SWSW	22	53	74	1.8	0.7	WYW-143563
3	JOHNSON CORRAL	NWSW	23	53	74	1.25	0.4	WYW-143563

2.3.2. Programmatic mitigation measures identified in the PRB FEIS ROD

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

2.3.2.1. Groundwater

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring and Siting Requirements for Unlined Coalbed Methane Produced Water Impoundments" which was approved September, 2006. For WYPDES permits received by DEQ after the effective date, the BLM requires that operators comply with the current approved DEQ compliance monitoring guidance document prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

2.3.2.2. Surface Water

1. Channel Crossings:
   a) Minimize channel disturbance as much as possible by limiting pipeline and road crossings.
   b) Avoid running pipelines and access roads within floodplains or parallel to a stream channel.
   c) 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.
   d) Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.
2. Low water crossings will be constructed at original streambed elevation in a manner that will prevent any blockage or restriction of the existing channel. Material removed will be stockpiled for use in reclamation of the crossings.

3. Concerns regarding the quality of the discharged CBNG water on downstream irrigation use may require operators to increase the amount of storage of CBNG water during the irrigation months and allow more surface discharge during the non-irrigation months.

4. The operator will supply a copy of complete approved SW-4, SW-3, or SW-CBNG permits to BLM as they are issued by WSEO for impoundments.

5. The operator will supply a copy of complete approved WYPDES permits to BLM as they are issued by WDEQ.

2.3.2.3. Soils

1. The Companies, on a case by case basis depending upon water and soil characteristics, will test sediments deposited in impoundments before reclaiming the impoundments. Tests will include the standard suite of cations, ions, and nutrients that will be monitored in surface water testing and any trace metals found in the CBNG discharges at concentrations exceeding detectable limits.

2.3.2.4. Wetland/Riparian

1. Power line corridors will avoid wetlands, to the extent possible, in order to reduce the chance of waterfowl hitting the lines. Where avoidance can't occur, the minimum number of poles necessary to cross the area will be used.

2. Wetland areas will be disturbed only during dry conditions (that is, during late summer or fall), or when the ground is frozen during the winter.

3. No waste material will be deposited below high water lines in riparian areas, flood plains, or in natural drainage ways.

4. The lower edge of soil or other material stockpiles will be located outside the active floodplain.

5. Disturbed channels will be re-shaped to their approximate original configuration or stable geomorphologic configuration and properly stabilized.

6. Reclamation of disturbed wetland/riparian areas will begin immediately after project activities are complete.

2.3.2.5. Wildlife

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

2. All stock tanks shall include a ramp to enable trapped small birds and mammals to escape. See Idaho BLM Technical Bulletin 89-4 entitled Wildlife Watering and Escape Ramps on Livestock Water Developments: Suggestions and Recommendations.

2.3.2.6. Visual Resources

1. The Companies will mount lights at compressor stations and other facilities on a pole or building and direct them downward to illuminate key areas within the facility while minimizing the amount of light projected outside the facility.

2.3.2.7. Noise

1. Noise mufflers will be installed on the exhaust of compressor engines to reduce the exhaust noise.

2. Where noise impacts to existing sensitive receptors are an issue, noise levels will be required to be no greater than 55 decibels measured at a distance of one-quarter mile from the appropriate booster (field) compressor. When background noise exceeds 55dBA, noise levels will be no greater than 5dBA above background. This may require the installation of electrical compressor motors at these locations.

2.3.2.8. Air Quality

1. During construction, emissions of particulate matter from well pad and resource road construction will be minimized by application of water, or other dust suppressants, with at least 50 percent control efficiency. Roads and well locations constructed on soils susceptible to wind erosion could be

appropriately surfaced or otherwise stabilized to reduce the amount of fugitive dust generated by traffic or other activities, and dust inhibitors (surfacing materials, non-saline dust suppressants, and water) could be used as necessary on unpaved collector, local and resource roads that present a fugitive dust problem. The use of chemical dust suppressants on BLM surface will require prior approval form the BLM authorized officer.

2.3.3. Site specific mitigation measures

All changes made at the onsite will be followed. They have all been incorporated into the operator's POD.

1. Onshore Order #1, as revised effective 05-07-07, requires that all operators certify to the Field Office in writing that they have supplied a copy of the Surface Use Plan to each of the private surface owners affected by the project. This self-certification must be received by this office before construction on the project begins.

2. For the following wells, construction can not be initiated or the pre-construction meeting held until a site specific Slot Diagram is submitted and field checked at the pre-construction meeting:
    a. 14-9-5374LC & 14-9-5374WA
    b. 34-9-5374LC & 34-9-5374WA
    c. 12-14-5374LC & 12-14-5374WA
    d. 34-14-5374LC & 34-14-5374WA
    e. 43-14-5374LC & 43-14-5374WA
    f. 14-15-5374LC & 14-15-5374WA
    g. 32-15-5374LC & 32-15-5374WA
    h. 41-22-5374LC & 14-22-5374WA
    i. 34-15-5374LC & 34-15-5374WA
    j. 12-17-5374LC & 12-17-5374WA
    k. 21-17-5374LC & 21-17-5374WA
    l. 32-17-5374LC & 32-17-5374WA
    m. 41-17-5374LC & 41-17-5374WA
    n. 32-18-5374LC & 32-18-5374WA
    o. 13-20-5374LC & 13-20-5374WA
    p. 21-20-5374LC & 21-20-5374WA
    q. 32-20-5374LC & 32-20-5374WA
    r. 34-20-5374LC & 34-20-5374WA
    s. 43-20-5374LC & 43-20-5374WA
    t. 12-21-5374LC & 12-21-5374WA
    u. 23-21-5374LC & 23-21-5374WA
    v. 12-23-5374LC & 12-23-5374WA
    w. 14-23-5374LC & 14-23-5374WA
    x. 23-23-5374LC & 23-23-5374WA
    y. 34-23-5374LC & 34-23-5374WA
    z. 21-24-5374LC & 21-24-5374WA
    aa. 41-28-5374LC & 41-28-5374WA

3. For the following wells, construction can not be initiated or the pre-construction meeting held until the roads designs and staking can be reviewed in the field:
    a. 13-20-5374LC & 13-20-5374WA
    b. 34-20-5374LC & 34-20-5374WA
    c. 23-20-5374WA

4. Access to the following wells requires a monitoring program for erosion and stability. If erosion

occurs and/or the road becomes unstable immediate action needs to be taken to prevent further disturbance.

a. 23-20-5374WA
b. 41-14-5374LC & 41-14-5374WA

5. Access to the following wells is restricted to pickup-truck access only, drilling rig and large truck traffic is to come in from the road in Section 8, T53N, R74W that comes from Middle Prong Road:
    a. 14-17-5374LC & 14-17-5374WA
    b. 14-9-5374LC & 14-9-5374WA

6. For the access road to the 41-20-5374LC and 41-205374WA well location at approximately station 37+20, road is in fill across a large headcut. Construct so that fill is benched (like stair steps) into existing material and armor the fill slope.

7. Line the pit and maintain a 25 foot undisturbed vegetated buffer from edge of drainage at the 14-17-53LC and 14-17-5374WA well location to avoid possible siltation down ephemeral drainage.

8. Line pit at the 12-22-5374LC & 12-22-5374WA well location due to the erosive soils and being near the drainage.

9. Avoid any disturbance of the highly erosive knob on the east side of the access to the 21-22-5374LC & 22-5374WA well location.

10. Access to the 44-22-5374LC & 44-22-5374WA well location will be a 2 track road. For the part of the road over the sandy ridge, the tracks are to be graveled.

11. For those proposed disturbance areas identified below, there are lands with limited reclamation potential that shall be stabilized in a manner which eliminates accelerated erosion until a self-perpetuating non-weed native plant community has stabilized the site in accordance with the Wyoming Reclamation Policy. Stabilization efforts shall be finished within 30 days of the initiation of construction activities.
    a. Access road to the 44-22-5374LC & 44-22-5374WA
    b. Access road to and the 32-22-5374LC & 32-225374WA well location

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

    Shallow Loamy Well Locations
    a. 14-9-5374LC & 14-9-5374WA
    b. 12-14-5374LC & 12-14-5374WA
    c. 12-15-5374LC & 12-15-5374WA
    d. 32-15-5374LC & 32-15-5374WA
    e. 32-17-5374LC & 32-17-5374WA
    f. 34-17-5374LC & 34-17-5374WA
    g. 43-17-5374LC & 43-17-5374WA
    h. 32-18-5374LC & 32-18-5374WA
    i. 13-20-5374LC & 13-20-5374WA

j. 23-20-5374WA
k. 32-20-5374LC & 32-20-5374WA
l. 41-20-5374LC & 41-20-5374WA
m. 12-21-5374LC & 12-21-5374WA
n. 43-20-5374LC & 43-20-5374WA
o. 23-21-5374LC & 23-21-5374WA
p. 12-22-5374LC & 12-22-5374WA
q. 32-22-5374LC & 32-22-5374WA
r. 41-22-5374LC & 41-22-5374WA

15-17" Precipitation Zone
Shallow Loamy Ecological Site Seed Mix

Species - *Cultivar*	% in Mix	Lbs PLS*
Western Wheatgrass (Pascopyrum smithii)	30	3.6
Bluebunch Wheatgrass (Pseudoroegneria spicata ssp. Spicata)	20	2.4
Green needlegrass (Nassella viridula)	20	2.4
Thickspike Wheatgrass (Elymus lanceolatus ssp. lanceolatus)	15	1.8
Prairie coneflower (Ratibida columnifera)	5	0.6
White or purple prairie clover (Dalea candidum, purpureum)	5	0.6
Rocky Mountain beeplant (Cleome serrulata)	5	0.6
Totals	**100%**	**12 lbs/acre**

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

Loamy Well Locations
a. 34-9-5374LC & 34-9-5374WA
b. 14-14-5374LC & 14-14-5374WA
c. 32-14-5374LC & 32-14-5374WA
d. 41-14-5374LC & 41-14-5374WA
e. 14-15-5374LC & 14-15-5374WA
f. 21-15-5374LC & 21-15-5374WA
g. 34-15-5374LC & 34-15-5374WA
h. 11-17-5374LC & 11-17-5374WA
i. 12-17-5374LC & 12-17-5374WA
j. 14-17-5374LC & 14-17-5374WA
k. 23-17-5374LC & 23-17-5374WA
l. 41-17-5374LC & 41-17-5374WA
m. 43-18-5374LC & 43-18-5374WA

n. 21-20-5374LC & 21-20-5374WA
o. 34-20-5374LC & 34-20-5374WA
p. 14-21-5374LC & 14-21-5374WA
q. 32-21-5374LC & 32-21-5374WA
r. 42-21-5374LC & 42-21-5374WA
s. 43-21-5374LC & 43-21-5374WA
t. 23-22-5374LC & 23-22-5374WA
u. 43-22-5374LC & 43-22-5374WA
v. 44-22-5374LC & 44-22-5374WA
w. 12-23-5374LC & 12-23-5374WA
x. 14-23-5374LC & 14-23-5374WA
y. 23-23-5374LC & 23-23-5374WA
z. 33-23-5374LC & 33-23-5374WA
aa. 43-23-5374LC & 43-23-5374WA
bb. 14-24-5374LC & 14-24-5374WA
cc. 21-24-5374LC & 21-24-5374WA
dd. 41-28-5374LC & 41-28-5374WA

15-17" Precipitation Zone
Loamy Ecological Site Seed Mix

Species - *Cultivar*	**% in Mix**	**Lbs PLS***
Thickspike Wheatgrass – *Critana*-**OR-** Western Wheatgrass - *Rosana*	35	4.2
Bluebunch Wheatgrass – *Secar or P-7*	15	1.8
Green needlegrass - *Lodorm*	25	3.0
Rocky Mountain beeplant *(Cleome serrulata)*	10	1.2
White – *Antelope* or Purple Prairie Clover - *Bismarck*	5	.60
Lewis - *Appar*, Blue, or Scarlet flax	5	.60
Winterfat – *Open Range*	5	.60
Totals	**100%**	**12 lbs/acre**

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

Clayey Well Locations
a. 23-14-5374LC & 23-14-5374WA
b. 34-14-5374LC & 34-14-5374WA
c. 43-14-5374LC & 43-14-5374WA
d. 43-15-5374LC & 43-15-5374WA
e. 21-22-5374LC & 21-22-5374WA

15-17" Precipitation Zone
Clayey Ecological Site Seed Mix

Species - *Cultivar*	% in Mix	Lbs PLS*
Western Wheatgrass - *Rosana*	40	2.4
Green needlegrass - *Lodorm*	40	2.4
American vetch **OR** Cicer Milkvetch - *Lutana*	10	.70
Lewis - *Appar*, Blue, or Scarlet flax	5	.20
Fourwing saltbush - *Wytana*	5	.25
Totals	**100%**	**5.95 lbs/acre**

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

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

13. Slopes too steep for machinery may be hand broadcast and raked with twice the specified amount of seed.

14. The approval of this project does not grant authority to use off unit Federal lands. No access or surface activity is allowed on the affected leases on Federal lands until right-of-way grants become authorized.

15. Please contact Ben Kniola, Natural Resource Specialist, @ (307) 684-1127, Bureau of Land Management, Buffalo, if there are any questions concerning these surface use COAs.

Livestock/wildlife watering facilities

1. Most pipelines are closed systems; therefore float valves are needed. Floats should be placed in the trough/tank. They must be adequately protected to keep animals from breaking them. A protective cover to house the floats is recommended.

2. If the system is not a closed system, a minimum of 1 ½ inch overflow pipe will be installed and the discharge point will be no less than 50 feet from the tank. Overflow waters will be discharged at a point where the potential for erosion is minimized.

3. Watering facilities should be placed on a gravel pad unless it is a rubber tire tank. Course material (4-6 inch fractured rock…scoria is not recommended) will be placed around the perimeter of the tanks/troughs and for a distance of no less than 6 feet around the perimeter

to reduce trampling and soil compaction from the watering animals so that tanks do not become 'pedestalled.'

Engineering

1. Provide 4 inches of aggregate where grades exceed 8% for stability and erosion prevention.

2. The operator is responsible for having the licensed professional engineer certify that the actual construction of the roads meets the design criteria and is constructed to Bureau of Land Management standards. This should be completed within 30 days of completion of engineered roads.

Wildlife

1. The following conditions will alleviate impacts to raptors;
    a. No surface disturbance shall occur within ½ mile of all identified nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This affects the following wells and **associated infrastructure; pipelines, low water crossings, culverts, temporary access roads, discharge points, and overhead power and drops.**

Project Features	BLM_ID	UTM_E	UTM_N
21-24	725	444231	4935122
21-15, 32-15, 12-15	3228	440370	4936215
14-15	3229	439340	4935488
32-17, 43-17, 34-17, Jacobs Reservoir	4617	438185	4935612
21-24	4828	444225	4935109
21-24	4829	444275	4935117
43-18	None	436353	4935531
14-9	None	438212	4936994
32-18	None	435966	4935992

    b. Surveys to document nest occupancy shall be conducted by a biologist following BLM protocol, between April 15 and June 30. All survey results shall be submitted in writing to a Buffalo BLM biologist. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a ½ mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within ½ mile of occupied raptor nests from February 1 to July 31.
    c. Nest productivity checks shall be completed for all raptor nests within the POD listed in the table above. The productivity checks shall be completed for the first five years following project completion. The productivity checks shall be conducted no earlier than June 1 or later than June 30 and any evidence of nesting success/production shall be recorded. Survey results will be submitted to a Buffalo BLM biologist in writing no later than July 31 of each survey year.
    d. Where the operator ties into existing power poles, the existing pole shall be fitted to meet or exceed 2007 APLIC standards.

2. The following conditions will alleviate impacts to sage-grouse:
    a. A survey is required for sage-grouse between April 1 and May 7, annually, within the project area for the duration of surface disturbing activities. The required sage grouse survey will be conducted by a biologist following the most current WGFD protocol. All survey results shall be submitted in writing to a Buffalo BLM biologist and reviewed prior to surface disturbing activities.
    b. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and surface disturbing activities will not be permitted until after the nesting season. If surveys indicate that the identified lek is inactive during the current breeding season, surface disturbing activities may be permitted within the 2 mile buffer until the following breeding season (March 1).

Known 2007 leks affecting the project and project elements within 2 miles.

Features within 2 miles	LEK_NAME	QQ	Q	SEC	TWN	RNG
34-20, Long Draw and Scott Reservoirs	Colton	NE	SW	32	53	74
12-17, 32-17, 32-18, 11-17, 41-17, 14-9, 34-9	Fitch Pro	NE	SW	5	53	75
32-18, 11-17, 12-17, 43-18	Playa	SW	SW	12	53	75
11-17, 41-17, 14-9, 34-9	Ridgetop	SE	NW	5	53	74

    c. Creation of raptor hunting perches will be avoided within 0.5-mile of documented sage-grouse lek sites. Perch inhibitors will be installed to deter avian predators from preying on sage grouse.

Cultural

1. The partial cultural inventory was field checked on 7/23/07. Due to unusually heavy vegetation cover and later access concerns by a landowner (hunting season), the Bureau did not have the opportunity to perform compliance checks for the majority of cultural inventory. Further compliance checks will be performed during the pre-construction onsite. If any cultural resources are discovered during the compliance checks, they will be treated as a discovery as outlined in Standard Condition of Approval #1 of the EA.

2.4. Alternatives considered but not analyzed in detail

Water management alternatives considered by the operator included deep injection, artificial wetlands, and treatment and discharge. For a complete discussion of the operator's reasons for rejection of these alternatives, see pages 8-9 of the water management plan.

3. DESCRIPTION OF AFFECTED ENVIRONMENT

Applications to drill were received on December 18, 2006. Field inspections of the proposed Long Draw Unit 2 CBNG project were conducted on by the following people:

DATE	NAME	TITLE	AGENCY
7/10/2007	Peggy Carter		Williams
7/10/2007	Buster Ivory	Engineer	Lowham Engineering
7/10/2007	Ben Adams	Hydrologist	BLM
7/10,23-25, 30-31/07; 8/22-23/07	Marion Scott	Landowner	Landowner
7/23-25, 30-31/07; 8/22-23/07	Duane Joslyn	Operations Superintendent	Williams
7/23-25, 30-31/07; 8/22-23/07	Ralph Demel	Construction Supervisor	Williams
7/23-25, 30-31/07	Steve Esponda		EMATS
7/10,23-25, 30-31/07; 8/22-23/07	Ben Kniola	Natural Resource Specialist	BLM
7/23-25, 30-31/07	Bill Ostheimer	Wildlife Biologist	BLM
7/23-25/07	Leigh Grench	Archaeologist	BLM
7/30/07; 8/22-23/07	Chris Perry	Civil Engineer	BLM
7/24/2007	Arnie Irwin	Soils Scientist	BLM
7/25, 30/07	Rex Lynde	Drilling Supervisor	Williams
7/23/2007	Gabe Gill		Williams
7/24, 25, 30/07	Richard VanCampen	Landman	Williams
7/23/2007	Bill Butcher	Landowner	Landowner
7/23/2007	Marilyn Mackey	Landowner	Landowner
7/30/07, 8/22-23/07	Doug Lofgren	Sr. Staff Engineer	EMATS
8/22-23/07	Jerry Means		
8/22/07	Hilaire Peck	Civil Engineer	BLM

This section describes the environment that would be affected by implementation of the Alternatives described in Section 2. Aspects of the affected environment described in this section focus on the relevant major issues. Certain critical environmental components require analysis under BLM policy. These items are presented below in Table 3.1.

Table 3.1 - Critical elements requiring mandatory evaluation are presented below.

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Threatened and Endangered Species		X		Bill Ostheimer
Floodplains			X	Ben Adams
Wilderness Values			X	Ben Kniola
ACECs			X	Ben Kniola
Water Resources	X			Ben Adams
Air Quality		X		Ben Kniola
Cultural or Historical Values		X		Leigh Grench
Prime or Unique Farmlands			X	Ben Kniola
Wild & Scenic Rivers			X	Ben Kniola

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Wetland/Riparian	X			Ben Adams
Native American Religious Concerns			X	Leigh Grench
Hazardous Wastes or Solids		X		Ben Kniola
Invasive, Nonnative Species	X			Ben Kniola
Environmental Justice		X		Ben Kniola

3.1. Topographic Characteristics of Project Area

Throughout the project area topography consists primarily of large hills that are cut by deep drainages, resulting in some very steep slopes. The highest point in the POD is at approximately 4600 feet, and several points in the area are nearly as high. The lowest point is at approximately 4100 feet. The middle of the project area contains the divide of the North Fork Wildcat Creek Watershed to the East and the Upper Middle Prong Wild Horse Creek Watershed to the West. The North Fork Wildcat Creek drains to the Little Powder River, while the Upper Middle Prong Wild Horse Creek drains to the Upper Powder River.

3.2. Soils & Vegetation

3.2.1. Soils

Soils within the project area were identified from the *North Campbell County Survey Area, Wyoming (WY705).* The soil survey was performed by the Natural Resource Conservation Service according to National Cooperative Soil Survey standards. Pertinent information for analysis was obtained from the published soil survey and the National Soils Information System (NASIS) database for the area. Erosion potential varies from moderate to severe depending on the site (soil type, vegetative cover and slope). Reclamation potential varies from well to poor throughout the project area. Soil rutting hazard varies from moderate to severe; suitability for reclaimable roads and excavations range from not limited to very limited and shallow excavations which range from somewhat to very limited.

The ten most common map units identified for the soils within this project area are listed in the table below along with the individual acreage and the percentage of the total area identified within the POD boundary.

Soil Map Units

Map Unit	Map Unit Name	Acres	Percent
278	FAIRBURN-SAMSIL-BADLAND COMPLEX, 10 TO 45 PERCENT SLOPES	1192.8	17%
225	UCROSS-IWAIT-FAIRBURN LOAMS, 3 TO 30 PERCENT SLOPES	1131.2	16%
324	UCROSS-FAIRBURN LOAMS, 15 TO 45 PERCENT SLOPES	1047.9	15%
174	BRISLAWN-ROCKYBUTTE-IRONBUTTE COMPLEX, 0 TO 10 PERCENT SLOPES	524.3	7%
275	ECHETA-MOORHEAD CLAY LOAMS, 0 TO 6 PERCENT SLOPES	486.3	7%
184	MOORHEAD-LEITER CLAY LOAMS, 6 TO 15 PERCENT SLOPES	437.7	6%

Map Unit	Map Unit Name	Acres	Percent
239	IRONBUTTE-FAIRBURN-MITTENBUTTE COMPLEX, 6 TO 40 PERCENT SLOPES	378.7	5%
206	SAMDAY-SHINGLE-BADLAND COMPLEX, 10 TO 45 PERCENT SLOPES	284.3	4%
176	LEITER-CROMACK CLAY LOAMS, 3 TO 15 PERCENT SLOPES	229.3	3%
298	NUNCHO CLAY LOAM, 0 TO 6 PERCENT SLOPES	228.0	3%

For more detailed soil information, see the NRCS Soil Survey 705 – Northern Campbell County.

Additional site specific soil information is included in the Ecological Site interpretations which follow.

3.2.2. Vegetation

Ecological Site Descriptions are used to provide soils and vegetation information needed for resource identification, management and reclamation recommendations. To determine the appropriate Ecological Sites for the area contained within this proposed action, BLM specialists analyzed data from onsite field reconnaissance and Natural Resources Conservation Service published soil survey soils information. The map unit symbols, identified above, for the soils and the associated ecological sites found within the POD boundary are listed in the table below.

Map Units and Ecological Sites

Map Unit	Ecological Site
174	LOAMY (15-17NP)
176	CLAYEY (15-17NP)
184	CLAYEY (15-17NP)
206	SHALLOW CLAYEY (10-14NP)
225	LOAMY (15-17NP)
239	SHALLOW LOAMY (15-17NP)
275	CLAYEY (15-17NP)
278	SHALLOW LOAMY (15-17NP)
298	CLAYEY (15-17NP)
324	LOAMY (15-17NP)

Dominant Ecological Sites and Plant Communities identified in this POD and its infrastructure, by dominant soil series are Loamy, Shallow Loamy and Clayey ecological sites.

Loamy Sites:

This site occurs on land nearly level up to 50% slopes on landforms which include hill slopes and the associated alluvial fans and stream terraces, in the 15-17 inch precipitation zone. The soils of this site are moderately deep to deep (greater than 20" to bedrock), well drained soils that formed in alluvium and residuum derived from unspecified sandstone. These soils have moderate permeability and may occur on all slopes.

The Historic Climax Plant Community (HCPC - defined as the plant community that was best adapted to the unique combination of factors associated with this ecological site) for this site would be a Rhizomatous Wheatgrasses/Needleandthread/Big Bluestem Plant Community. The potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants. A mix of warm and cool season mid-grasses dominate the state. The present plant community is a *Mixed Sagebrush/Grass*. Compared to the HCPC, sagebrush and blue grama have increased. Production of the cool season grasses have decreased.

Wyoming big sagebrush is a significant component of this Mixed Sagebrush/Grass plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. Other vegetative species identified at onsite: western wheatgrass, Wyoming big sagebrush, western yarrow.

Shallow Loamy Sites:
This site occurs on steep slopes and ridge tops, but may occur on all slopes on landforms which include hill sides, ridges and escarpments, in the 15-17 inch precipitation zone. The soils of this site are shallow (less than 20" to bedrock), well drained soils that formed in alluvium and residuum derived from shale and sandstone. These soils have moderate permeability and may occur on all slopes. The main soil limitations include depth to bedrock.

The HCPC for this site is also a Rhizomatous Wheatgrasses/Needleandthread/Big Bluestem Plant Community. The present plant community is also *Mixed Sagebrush/Grass*. Other vegetative species identified at onsite: western wheatgrass, western yarrow, Wyoming big sagebrush, blue-bunch wheatgrass, and yucca.

Clayey Sites:
This site occurs on land nearly level to 30% slopes on landforms which include hill sides, alluvial fans, and stream terraces, in the 15-17 inch precipitation zone. The soils of this site are moderately deep to deep (greater than 20" to bedrock), well drained soils that formed in alluvium or alluvium over residuum derived from calcareous shale. These soils have slow permeability and may occur on all slopes.

The Historic Climax Plant Community (HCPC - defined as the plant community that was best adapted to the unique combination of factors associated with this ecological site) for this site would be a Rhizomatous Wheatgrasses, Green needleandthread Plant Community. The potential vegetation is about 80% grasses or grass-like plants, 10% forbs, and 10% woody plants. A mix of cool season mid-grasses and warm season grasses dominate the state.

The present plant community is a *Mixed Sagebrush/Grass*. Compared to the HCPC, sagebrush and blue grama have increased. Production of the cool season grasses have decreased.
Wyoming big sagebrush is a significant component of this Mixed Sagebrush/Grass plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. Other vegetative species identified at onsite: Green-needle grass and sagebrush.

Ecological Site	Acres	Percent
LOAMY (15-17NP)	3080.6	43%
SHALLOW LOAMY (15-17NP)	1571.5	22%
CLAYEY (15-17NP)	1515.9	21%
LOAMY (10-14NP)	355.4	5%
SHALLOW CLAYEY (10-14NP)	284.3	4%
CLAYEY (10-14NP)	220.3	3%
SANDY (15-17NP)	104.6	1%
LOWLAND (15-17NP)	32.7	<1%
SALINE UPLAND (15-17NP)	32.3	<1%

Species typical of short grass prairie comprise the project area flora. Specific species observed throughout the project area include western wheatgrass, blue-bunch wheatgrass, sagebrush, western

yarrow, and yucca. Differences in dominant species within the project area vary with soil type, aspect and topography.

The soils vary from shallow loamy to loamy to clayey primarily throughout the project area. Soils differ with topographic location, slope and elevation. Topsoil depths to be salvaged for reclamation range from zero to four inches on ridges and four to eight inches in bottomland. Erosion potential varies from minimal to moderate depending on the soil type, vegetative cover and slope. Reclamation potential of soils also varies throughout the project area.

3.2.3. Wetlands/Riparian

Wetland and riparian areas are not well developed within the project area, except those that have developed around the existing old reservoirs. In these instances the areas are small and isolated and solely dependent on water caught by the dams. Isolated cottonwood trees can be found throughout the project area.

3.2.4. Invasive Species

The following state-listed noxious weeds and/or weed species of concern infestations were discovered by a search of inventorydatabases on the Wyoming Energy Resource Information Clearinghouse (WERIC) web site (www.weric.info):

- leafy spurge (*Euphorbia esula*)

The WERIC database was created cooperatively by the University of Wyoming, BLM and county Weed and Pest offices. Additionally, the operator or BLM confirmed the following WRIC identified infestations and/or documented additional weed species during subsequent field investigations:

- Russian knapweed (*Centaurea repens*)
- Canada thistle (*Cirsium arvense*)
- Scotch thistle (*Onopordum acanthuim*)

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

3.3. Wildlife

Several resources were consulted to identify wildlife species that may occur in the proposed project area. Resources that were consulted include the wildlife database compiled and managed by the BLM Buffalo Field Office (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).

A habitat assessment and wildlife inventory surveys were performed by Real West Natural Resource Consulting. Surveys for greater sage-grouse and plains sharp-tailed grouse were conducted on April 12, 16, 23, and May 7, 2005. 2007 dates were April 5, 20, and 29. Surveys for mountain plover nesting activity were completed on May 7, 27, 28 2005, and May 7, 12, and 29 in 2006; the project area was ground searched for raptor nests and prairie dog colonies in 2005 on April 12, 16, 23, May 7, 27, 28, in 2006 on April 1, 8, 29, and May 7, 12, 29 and in 2007 on April 20, and 29. No formal surveys were conducted for Ute ladies'-tresses orchid. Bald eagle roost surveys were performed December 28 2004, January 27 , February 8, and December 15 2005, January 6, February 23, December 12 2006, and January 24, February 23 2007.

A BLM biologist conducted field visits on July 23-25 and 30-31, 2007. During this time, the biologist reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project adjustment recommendations where wildlife issues arose.

Wildlife species common to the habitat types present are identified in the Final Environmental Impact Statement and Proposed Plan Amendment for the Powder River Basin Oil and Gas Project (PRB FEIS 3-114). Species that have been identified in the project area or that have been noted as being of special importance are described below.

3.3.1. Big Game

Big game species expected to be within the project area include pronghorn and mule deer. The WGFD has determined the entire project area to be yearlong range for pronghorn and mule deer. Big game range maps are available in the PRB FEIS (3-119-143), the project file, and from the WGFD.

3.3.2. Aquatics

Fish that have been identified in the Upper Powder and Little Powder River watersheds are listed in the PRB FEIS (3-156-159). There are numerous small impoundments in the ephemeral draws within the project boundary.

3.3.3. Migratory Birds

A wide variety of migratory birds may be found in the proposed project area at some point throughout the year. Migratory birds are those that migrate for the purpose of breeding and foraging at some point in the calendar year. Migratory bird species of management concern that may occur in the project area are listed in the PRB FEIS (3-151). Species seen on the onsite include Brewer's sparrow, loggerhead shrike, and sage-thrasher.

3.3.4. Raptors

Nine raptor nest sites were identified by Real West and BLM within 0.5 mile of the project area, of these five nests were active in 2007 (Real West 2006, 2007).

Table 3.2. Documented raptor nests within the project area in 2007.

BLM ID	UTM E	UTM N	SEC	TWP	RNG	SPECIES	SUBSTRATE	2007 Status
725	444231	4935122	24	53	74	Red-tailed Hawk	Cottonwood	Active
3228	440370	4936215	15	53	74	Great-horned Owl	Cottonwood	Active
3229	439340	4935488	16	53	74	Red-tailed Hawk	Juniper	Inactive
4617	438185	4935612	17	53	74	Great-horned Owl	Juniper	Inactive
4828	444225	4935109	24	53	74	Great-horned Owl	Box Elder	Inactive
4829	444275	4935117	24	53	74	Red-tailed Hawk	Box Elder	Inactive
None	436353	4935531	18	53	75	American Kestrel	Bank	Active
None	438212	4936994	8	53	75	American Kestrel*	Unknown	Active
None	435966	4935992	18	53	75	American Kestrel**	Unknown	Active

* pair seen displaying and vocalizing in this area. Nest not found. UTMs are approximate.
** pair seen with juvenile vocalizing and feeding. Nest not found. UTMs are approximate.

3.3.5. Threatened and Endangered and Sensitive Species

3.3.5.1. Threatened and Endangered Species

Within the BLM Buffalo Field Office there are two species that are Threatened or Endangered under the Endangered Species Act.

3.3.5.1.1. Black-footed ferret

The USFWS listed the black-footed ferret as Endangered on March 11, 1967. Active reintroduction efforts have reestablished populations in Mexico, Arizona, Colorado, Montana, South Dakota, Utah, and Wyoming. In 1988, the WGFD identified four prairie dog complexes (Arvada, Recluse, Thunder Basin National Grasslands, and Midwest) partially or wholly within the BLM Buffalo Field Office administrative area as potential black-footed ferret reintroduction sites (Oakleaf 1988).

This nocturnal predator is closely associated with prairie dogs, depending almost entirely upon them for its food. The ferret also uses old prairie dog burrows for dens. Current science indicates that a black-footed ferret population requires at least 1000 acres of black-tailed prairie dog colonies for survival (USFWS 1989).

The WGFD believes the combined effects of poisoning and Sylvatic plague on black-tailed prairie dogs have greatly reduced the likelihood of a black-footed ferret population persisting east of the Big Horn Mountains (Grenier 2003). The U.S. Fish and Wildlife Service has also concluded that black-tailed prairie dog colonies within Wyoming are unlikely to be inhabited by black-footed ferrets (Kelly 2004).

Eight black-tailed prairie dog towns were identified during site visits by Real West within the project area totaling 26 acres over six sections. The closest area identified as a potential reintroduction site (Oakleaf 1988) is the Arvada complex adjacent to the POD's west boundary.

3.3.5.1.2. Ute's Ladies Tresses Orchid

This orchid is listed as Threatened under the Endangered Species Act. It is extremely rare and occurs in moist, sub-irrigated or seasonally flooded soils at elevations between 1,780 and 6,800 feet above sea level. Habitat includes wet meadows, abandoned stream channels, valley bottoms, gravel bars, and near lakes or perennial streams that become inundated during large precipitation events. Prior to 2005, only four orchid populations had been documented within Wyoming. Five additional sites were located in 2005 and one in 2006 (Heidel pers. Comm.). The new locations were in the same drainages as the original populations, with two on the same tributary and within a few miles of an original location. Drainages with documented orchid populations include Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County.

The project area is drained by ephemeral tributaries of Wildcat and Middle Prong Creek. Middle Prong flows into the Powder River; Wildcat Creek is a tributary of the Little Powder River. Suitable orchid habitat was not found in the project area (Real West 2006).

3.3.5.2. Sensitive Species

The USDI Bureau of Land Management (BLM) Wyoming has prepared a list of sensitive species to focus species management efforts towards maintaining habitats under a multiple use mandate. The authority for this policy and guidance comes from the Endangered Species Act of 1973, as amended; Title II of the Sikes Act, as amended; the Federal Land Policy and Management Act (FLPMA) of 1976; and the Department Manual 235.1.1A.

3.3.5.2.1. Bald eagle

On February 14, 1978, the bald eagle was federally listed as Endangered. On August 8, 2007, the bald eagle was removed from the Endangered Species list. The bald eagle remains under protection by the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. In order to avoid violation of these laws and uphold the BLM's commitment to avoid any future listing of this species, all conservation measures and terms and conditions identified in the Powder River Basin Oil and Gas Project Biological Opinion (WY07F0075) shall continue to be complied with.

Bald eagle nesting habitat is generally areas that support large mature trees. Eagles typically will build their nests in the crown of mature trees that are close to a reliable prey source. This species feeds primarily on fish, waterfowl, and carrion. In more arid environments, such as the Powder River Basin, prairie dogs, ground squirrels, and lagomorphs (hares and rabbits) can make up the primary prey base. The diets of wintering bald eagles can be more varied. In addition to prairie dogs, ground squirrels, and lagomorphs, domestic sheep and big game carcasses may provide a significant food source in some areas. Historically, sheep carcasses from large domestic sheep ranches provided a reliable winter food source within the Powder River Basin (Patterson and Anderson 1985). Today, few large sheep operations remain in the Powder River Basin. Wintering bald eagles may congregate in roosting areas generally made up of several large trees clumped together in stands of large ponderosa pine, along wooded riparian corridors, or in isolated groups. Bald eagles often share these roost sites with golden eagles as well.

The project has marginal roosting habitat along the eastern and western boundaries. Nine surveys were completed from 2004-2007 with no bald eagles seen. Suitable roosting habitat begins to develop to the west of the POD down Middle Prong on to Wild Horse Creek and into the Powder River.

3.3.5.2.2. Black-tailed prairie dog

On August 12, 2004, the U.S. Fish and Wildlife Service removed the black-tailed prairie dog's Candidate status. The Buffalo Field Office however will consider prairie dogs as a sensitive species and continue to afford this species the protections described in the FEIS. The black-tailed prairie dog is a diurnal rodent inhabiting prairie and desert grasslands of the Great Plains. Their decline is related to multiple factors including, habitat destruction, poisoning, and Sylvatic plague.

Eight black-tailed prairie dog towns were identified during site visits by Real West within the project area totaling 26 acres over six sections.

3.3.5.2.3. Greater sage-grouse

Greater sage-grouse are found in prairie, sagebrush shrublands, other shrublands, wet meadows, and agricultural areas; they depend upon substantial sagebrush stands for nesting and winter survival (BLM 2003).

Suitable sage-grouse habitat is present throughout the project area. One hen and two chicks were seen 60 meters west of the 34-23 well location. BLM records identified four sage grouse leks within 3 miles of the POD. These leks are identified below.

Table 3.3. **Sage-grouse lek(s) surrounding the** Long Draw Unit 2 **project area.**

LEK NAME	QQ	Q	SEC	TWN	RNG	ZONE	EASTING	NORTHING
Colton	NE	SW	32	53	74	13	437309	4930528
Fitch Pro	NE	SW	5	53	75	13	437352	4939109
Playa	SW	SW	12	53	75	13	433858	4937162
Ridgetop	SE	NW	5	53	74	13	437300	4939400

3.3.5.2.4. Mountain plover

Mountain plovers, which are a Buffalo Field Office sensitive species, are typically associated with high, dry, short grass prairies containing vegetation typically shorter than four inches tall, and slopes less than 5 degrees (BLM 2003). Mountain plovers are closely associated with heavily grazed areas such as prairie dog colonies and livestock pastures.

Suitable mountain plover habitat is present in very small patches on prairie dog towns. Overall the topography of the project area makes it unsuitable. The POD was protocol surveyed for mountain plover in 2006 with none found. (Real West 2006)

3.4. West Nile Virus

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

Since its discovery in 1999 in New York, WNv has become firmly established and spread across the United States. Birds are the natural vector host and serve not only to amplify the virus, but to spread it. Though less than 1% of mosquitoes are infected with WNv, they still are very effective in transmitting the virus to humans, horses, and wildlife. *Culex tarsalis* appears to be the most common mosquito to vector, WNv.

The human health issues related to WNv are well documented and continue to escalate. Historic data collected by the CDC and published by the USGS at www.westnilemaps.usgs.gov are summarized below. Reported data from the Powder River Basin (PRB) includes Campbell, Sheridan and Johnson counties.

Table 3.4 Historical West Nile Virus Information

Year	Total WY Human Cases	Human Cases PRB	Veterinary Cases PRB	Bird Cases PRB
2001	0	0	0	0
2002	2	0	15	3
2003	392	85	46	25
2004	10	3	3	5
2005	12	4	6	3
2006	65	0	2	2
2007	155	22	Unk	1

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

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

Population impacts of WNv on raptors are unknown at present. The Wyoming State Vet Lab determined 22 sage-grouse in one study project (90% of the study birds), succumbed to WNv in the PRB in 2003. While birds infected with WNv have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003).

Mosquitoes can potentially breed in any standing water that lasts more than four days. In the Powder River Basin, there is generally increased surface water availability associated with CBNG development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the Powder River Basin indicates WNv mosquito vectors were notably more abundant on a developed CBNG site than two similar undeveloped sites (Walker et al. 2003). Reducing the population of mosquitoes, especially species that are apparently involved with bird-to-bird transmission of WNv, such as *Culex tarsalis*, can help to reduce or eliminate the presence of virus in a given geographical area (APHIS 2002). The most important step any property owner can take to control such mosquito populations is to remove all potential man-made sources of standing water in which mosquitoes might breed (APHIS 2002).

The most common pesticide treatment is to place larvicidal briquettes in small standing water pools along drainages or every 100 feet along the shoreline of reservoirs and ponds. It is generally accepted that it is not necessary to place the briquettes in the main water body because wave action prevents this environment from being optimum mosquito breeding habitat. Follow-up treatment of adult mosquitoes with malathion may be needed every 3 to 4 days to control adults following application of larvicide (Mooney, personal conversation). These treatment methods seem to be effective when focused on specific target areas, especially near communities, however they have not been applied over large areas nor have they been used to treat a wide range of potential mosquito breeding habitat such as that associated with CBNG development.

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

3.5. Water Resources

The project straddles the divide between Wild Horse Creek, a tributary to the Upper Powder River, and various tributaries to the North Fork of Wildcat Creek and Horse Creek, both tributaries to the Little Powder River.

3.5.1. Groundwater

Wyoming Department of Environmental Quality (WDEQ) water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following limits for Total Dissolved Solids (TDS) and the classes of groundwater; 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).

The PRB EIS Record of Decision includes a Monitoring, Mitigation and Reporting Plan (MMRP). The objective of the plan is to monitor those elements of the analysis where there was limited information available during the preparation of the EIS. The MMRP called for the use of adaptive management where changes could be made based on monitoring data collected during implementation. Specifically related to groundwater, the plan identified the following (PRB EIS ROD page E-4):

- The effects of infiltrating waters on the water quality of existing shallow groundwater aquifers are not well documented at this time

- Potential impacts will be highly variable depending upon local geologic and hydrologic conditions
- It may be necessary to conduct investigations at representative sites around the basin to quantify these impacts
- Provide site specific guidance on the placement and design of CBNG impoundments
- Shallow groundwater wells would be installed and monitored where necessary

As stated in the MMRP, an Interagency Working Group has been established to implement an adaptive management approach. BLM is working with the WDEQ and the Interagency Working Group regarding the monitoring information being collected and assessed to determine if changes in mitigation are warranted.

The BLM installed shallow groundwater monitoring wells at five impoundment locations throughout the PRB to assess ground-water quality changes due to infiltration of CBNG produced water. The most intensively monitored site had a battery of nineteen wells which were installed and monitored jointly by the BLM and USGS starting in August of 2003. Water quality data has been sampled from these wells on a regular basis. That impoundment site, which has since been reclaimed, lies atop approximately 30 feet of unconsolidated deposits (silts and sands) which overlie non-uniform bedrock on a side ephemeral tributary to Beaver Creek and is approximately one and one-half miles from the Powder River. Baseline investigations showed water in two sand zones, the first was at a depth of 55 feet and the second was at a depth of 110 feet. The two water bearing zones were separated by a fifty-foot thick shale layer. The water quality of the two water bearing zones fell in the WDEQ Class III and Class I classifications respectively. Preliminary results from this sampling indicated increasing levels of TDS and other inorganic constituents over a six month period resulting in changes from the initial WDEQ classifications.

The on-going shallow groundwater impoundment monitoring at four other impoundment locations are less intensive and consist of batteries of between 4 and 6 wells. Preliminary data from two of these other sites also are showing an increasing TDS level as water infiltrates while two other sites are not.

The WDEQ implemented requirements for monitoring shallow groundwater of Class III or better quality under unlined CBNG water impoundments effective August 1, 2004. The intent is to identify locations where the impoundment of water could potentially degrade any existing shallow groundwater aquifers. These investigations are conducted where discharged water will be detained in existing or proposed impoundments. If shallow groundwater is detected and the water quality is determined to fall within the Class III or better class of use (WDEQ Chapter 8 classifications for livestock use), operators are required to install batteries of 1 to 3 wells, develop a monitoring plan and monitor water levels and quality. The results of these investigations have yet to be analyzed and interpreted.

A search of the Wyoming State Engineer Office (WSEO) Ground Water Rights Database for this area showed 19 registered stock and domestic water wells within 1 mile of the POD with depths ranging from 120 to 900 feet. For additional information on water, please refer to the PRB FEIS (January 2003), Chapter 3, Affected Environment pages 3-1 through 3-36 (groundwater).

3.5.2. Surface Water

The project area straddles the divide between Wild Horse Creek, a tributary to the Upper Powder River, and various tributaries to the North Fork of Wildcat Creek and Horse Creek, both tributaries to the Little Powder River. All of the drainages in the area are ephemeral (flowing only in response to a precipitation event or snow melt – PRB FEIS Chapter 9 Glossary), with the exception of the lower reaches of Boruff Draw and the North Fork of Wildcat Creek, which are now perennial to intermittent due to the discharge of CBNG produced water from previous development. The channels range from steep, narrow, eroding

gully systems to vegetated grassy swales without defined beds and banks as they come out of the hills onto the outwash plains. When the tributaries to the Little Powder River reach the main channels of North Fork Cat Creek and Boruff Draw, the land becomes quite flat with much shallower draws. Numerous dams have been constructed over the years by the landowner to catch runoff water and enhance livestock distribution. These dams range from failed to relatively good condition. Only one of the dams visited during the onsite had water in it, with the exception of those in the Little Powder River drainage which are already being used for storage and infiltration of CBNG by-product water.

The PRB FEIS presents the historic mean Electrical Conductivity (EC, in µmhos/cm) and Sodium Adsorption Ratio (SAR) by watershed at selected United States Geological Survey (USGS) Gauging Stations in Table 3-11 (PRB FEIS page 3-49). These water quality parameters "…illustrate the variability in ambient EC and SAR in streams within the Project Area. The representative stream water quality is used in the impact analysis presented in Chapter 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBM produced water of varying chemical composition to surface drainages within the Project Area" (PRB FEIS page 3-48). For the Powder River at Arvada, Wyoming, gauging station (Upper Powder River watershed), the EC ranges from 1797 µmhos/cm at Maximum monthly flow to 3400 µmhos/cm at Low monthly flow and the SAR ranges from 4.76 at Maximum monthly flow to 7.83 at Low monthly flow. For the Little Powder River above Dry Creek near Weston, Wyoming, gauging station (Little Powder River watershed), the EC ranges from 1785 µmhos/cm at Maximum monthly flow to 3300 µmhos/cm at Low monthly flow and the SAR ranges from 4.44 at Maximum monthly flow to 6.94 at Low monthly flow. (PRB FEIS page 3-49).

The operator has identified two natural springs permitted with the WSEO within this POD's boundary.

Elizabeth #1 is located in the NESE portion of section 8, T53N, R74W. Flow was measured at 3 gpm, the water was acidic (pH of 6.73), high in sulfates (4210 mg/l), high electrical conductivity (6330 µS/cm), high in TDS (6450 mg/l), but had a fairly low SAR (4.1)

Coal Bank #1 spring is located in the SESW portion of section 15 T53N, R74W. Flow was measured at 0.45 gpm, the water was acidic (pH of 6.37), high electrical conductivity (4480 µS/cm), high in TDS (4530 mg/l), but had a low SAR (1.0). Sulfate content was 2910 mg/l.

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

3.6. Cultural Resources

Class III cultural resource inventories were conducted for the Long Draw Unit 2 project prior to on-the-ground project work (BFO project no. 70070067). Foothills Archaeological Consulting conducted a block and linear Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) for the project.

Leigh Grench, BLM Archaeologist, reviewed the report for technical adequacy and compliance with Bureau of Land Management (BLM) standards, and determined it to be adequate. The following resources are located within the project area.

Table 3.6 Cultural Resource Sites Identified within the Long Draw II project area

Site Number	Site Type	Eligibility
48CA2130	Historic Homestead	Not Eligible
48CA5273	Prehistoric Lithic Scatter	Not Eligible

4. ENVIRONMENTAL CONSEQUENCES

The changes to the proposed action POD, which resulted in development of Alternative C as the preferred alternative, have reduced the impact to the environment which will result from this action. The environmental consequences of Alternative C are described below.

4.1. Vegetation & Soils Direct and Indirect Effects

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

- Mixing of horizons occurs where construction on roads, pipelines or other activities take place. Mixing may result in removal or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Soils which are more susceptible to wind and water erosion may be moved to the surface. Soil structure may be destroyed, which may impact infiltration rates. Less desirable inorganic compounds such as carbonates, salts or weathered materials may be relocated and have a negative impact on revegetation. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
- Loss of soil vegetation cover, biologic crusts, organic matter and productivity.
- Soil erosion would affect soil health and productivity. Erosion rates are site specific and are dependant on soil, climate, topography and cover.
- Soil compaction is the collapse of soil pores resulting in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction may be remediated by plowing or ripping.
- Modification of hill slope hydrology.

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

Impacts to vegetation and soils from surface disturbance will be reduced, by following the operator's plans and BLM applied mitigation. Of the 105 proposed well locations, 2 are on a reclaimed conventional well pad, 42 can be drilled without a well pad being constructed, 54 will be drilled using a slotted pad, and 9 will require a constructed (cut & fill) well pad. Surface disturbance associated with the drilling of the 42 wells without constructed pads would involve digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction (estimated approximate size of 25 x 40 feet), and compaction (from vehicles driving/parking at the drill site). Estimated disturbance associated with these 42 wells on 21 locations would involve approximately 0.34 acre/location for 7.14 total acres. The 9 wells requiring cut & fill pad construction, on 5 pads, would disturb approximately 0.5 acres/well pad for a total of 2.5 acres. The remaining 54 wells requiring a slotted pad would disturb approximately 0.22 acres/well for 11.88 total acres. The total estimated disturbance for all 105 wells would be 21.53 acres.

Approximately 11.176 miles of improved roads would be constructed to provide access to various well locations. Approximately 9.2 miles of new and existing two-track trails would be utilized to access well sites. The majority of proposed pipelines (gas and water) have been located in "disturbance corridors." Disturbance corridors involve the combining of 2 or more utility lines (water, gas, power) in a common trench, usually along access routes. This practice results in less surface disturbance and overall environmental impacts. Approximately 1.2 miles of pipeline would be constructed outside of corridors. Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, etc.) would ensure land productivity/stability is regained and maximized.

Proposed stream crossings, including culverts and low water crossings are shown on the MSUP and the WMP maps (see the POD). These structures would be constructed in accordance with sound, engineering practices and BLM standards.

The PRB FEIS made predictions regarding the potential impact of produced water to the various soil types found throughout the Basin, in addition to physical disturbance effects. "Government soil experts state that SAR values of 13 or more cause potentially irreversible changes to soil structure, especially in clayey soil types, that reduce permeability for infiltration of rainfall and surface water flows, restrict root growth, limit permeability of gases and moisture, and make tillage difficult." (PRB FEIS page 4-144).

Table 4.1 summarizes the proposed surface disturbance.

Table 4.1 - SUMMARY OF DISTURBANCE

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Nonconstructed Pad	21 locations	0.34 acre/location	7.14	Long Term
Constructed Pad	5 pads	0.5 acre/pad	2.5	
Slotted Pad	54 wells	0.22 acre/well	11.88	
Gather/Metering Facilities	1	Site Specific	0.1	Long Term
Screw Compressors	0	Site Specific	0.0	Long Term
Monitor Wells	0	0.1/acre	0.0	Long Term
Impoundments				
On-channel	16	Site Specific	40	
Off-channel	0	Site Specific	0.0	Long Term
Water Discharge Points	16	Site Specific or 0.01 ac/WDP	1.0	
Channel Disturbance				
Headcut Mitigation*	0	Site Specific	0.0	
Channel Modification	0	Site Specific	0.0	
Improved Roads				
No Corridor	2.0	20' Width	4.8	Long Term
With Corridor	4.2	50' Width	25.5	
2-Track Roads				
No Corridor	1.0	14' Width	1.7	Long Term
With Corridor	7.4	50' Width	44.9	
Pipelines				
No Corridor	1.2	30' Width	4.4	Short Term
With Corridor	1.3	50' Width	7.9	
Buried Power Cable No Corridor	0.0	12' Width or Site Specific	0.0	Short Term
Overhead Powerlines	6.4	30' Width	23.3	Long Term

The designation of the duration of disturbance is defined in the PRB FEIS (pg 4-1 and 4-151). "For this EIS, short-term effects are defined as occurring during the construction and drilling/completion phases.

Long-term effects are caused by construction and operations that would remain longer".

4.1.1. Wetland/Riparian

Wetland and riparian areas are not well developed within the project area, except those that have developed around the existing old reservoirs. In these instances the areas are small and isolated and solely dependent on water caught by the dams. Isolated cottonwood trees can be found throughout the project area.

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow (PRB FEIS pg 4-74). Re-surfacing water from the impoundments will potentially allow for wetland-riparian species establishment. In addition, water is being discharged into the Wildcat Creek drainage as per the "Water Administration Plan" developed by the WSEO and WDEQ to address irrigation concerns in that watershed.

Wetland and riparian areas are developing along these tributaries to Wildcat Creek. However, true wetland and riparian areas do not become readily apparent until the Little Powder River is reached some 44 channel miles downstream.

Water discharged into the Powder River watershed is to be fully contained in impoundments. It is unlikely that, even if all produced water were impounded behind the dams in this watershed (585 gpm or 1.3 cfs), the 88 gpm predicted to resurface as channel flow would reach the Powder River, which is more than 30 channel miles downstream of the POD boundary.

4.1.2. Invasive Species

Based on the investigations performed during the POD planning process, the operator has committed to the control of noxious weeds and species of concern using the following measures in an Integrated Pest Management Plan (IPMP) included in the proposal:

1. An herbicide treatment of the weeds will be implemented according to the IMPM.
2. Precautionary measures, such as washing vehicles, may also be implemented to minimize seed transportation and dispersal.
3. Williams will educate their field personnel and other contractors in identification and awareness of noxious weeds. Field pamphlets may be placed in all the vehicles to increase awareness of the noxious weeds in the Powder River Basin.
4. For more specific information see the IPMP found in Exhibit C of the Master Surface Use Plan.

Cheatgrass or downy brome (*Bromus tectorum*) and to a lesser extent, Japanese brome (*B. japonicus*) are known to exist in the affected environment. These two species are found in such high densities and numerous locations throughout NE Wyoming that a control program is not considered feasible.

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. Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry regimes in the areas of water release and storage. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, Canada thistle and perennial pepperweed. However, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

4.1.3. Cumulative Effects

The PRB FEIS stated that cumulative impacts to soils could occur due to sedimentation from water erosion that could change water quality and fluvial characteristics of streams and rivers in the sub-

watersheds of the Project Area. SAR in water in the sub-watersheds could be altered by saline soils because disturbed soils with a conductivity of 16 mmhos/cm could release as much as 0.8 tons/acre/year of sodium (BLM 1999c). Soils in floodplains and streambeds may also be affected by produced water high in SAR and TDS. (PRB FEIS page 4-151).

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

- They are proportional to the actual amount of cumulatively produced water in the Upper Powder River and Little Powder River drainages and the total amounts that were predicted in the PRB FEIS for each watershed, which are approximately 17% and 43%, respectively, of those totals (see section 4.4.2.1).
- The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
- The commitment by the operator to monitor the volume of water flowing into the tributaries of the North Prong of Horse Creek and to construct additional downstream reservoirs, if necessary, to prevent significant volumes of water from flowing into the Upper Powder River Watershed.
- The WMP for the Long Draw Unit 2 proposes that produced water will not contribute significantly to flows in the Powder River. Flows into Wildcat Creek are dependent upon the "Wildcat Creek Water Administration Plan".

No additional mitigation measures are required.

4.2. Wildlife

4.2.1. Big Game Direct and Indirect Effects

Under the environmentally preferred alternative, yearlong range for pronghorn and mule dear would be directly disturbed with the construction of wells, reservoirs, pipelines and roads. Table 4.1 summarized the proposed activities; items identified as long term disturbance would be direct habitat loss. Short-term disturbances also result in direct habitat loss; however, they should provide some habitat value as these areas are reclaimed and native vegetation becomes established.

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

Big game animals are expected to return to the project area following construction; however, populations will likely be lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and as the Pinedale Anticline study suggests mule deer do not readily habituate. A study in North Dakota stated "Although the population (mule deer) had over 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. In order to survive 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.

The Wyoming Game and Fish summarizes the impacts of CBNG development on this mule deer herd unit as follows:

> "Yet another issue for this herd unit involves the increasing disturbance and habitat fragmentation associated with Coal Bed Methane (CBM) activity in the area. In addition to problems arising from habitat loss and disturbance caused by increased vehicular traffic, safety issues are also a concern for landowners who have leased parts of their ranches for CBM development. As a result, landowners tend to be even more reluctant about allowing adequate access for hunters. Complaints from hunters are on the rise as well, as they have to compete more and more with CBM-related traffic and disturbance of game animals during their hunt."

4.2.1.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-211.

4.2.2. Aquatics Direct and Indirect Effects

Produced water discharged to the Upper Powder River watershed is to be fully contained in impoundments. If a reservoir were to discharge, it is unlikely produced water would reach a fish-bearing stream. Downstream species should not be affected.

Produced water discharged to the Little Powder River watershed is to be managed according to the "Water Management Plan" developed for that drainage and included with the Water Management Plan. It is unlikely that water discharged as a result of this action will materially affect water quantity or quality in the Little Powder River which is more than 44 channel miles downstream of the POD boundary.

4.2.2.1. Cumulative effects

WDEQ is aware of the concerns about the effects of water quality and flows relative to discharge of treated water directly into the Powder River. They are taking a conservative approach to permitting until more information can be obtained and their watershed based permitting approach is implemented. Long term water quality and flow monitoring, that would be required in the WYPDES permit, would ensure that effluent limitations are met. Under permitted conditions, it is not anticipated that existing downstream water uses would be affected. The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-247. No additional mitigation measures are required.

4.2.3. Migratory Birds Direct and Indirect Effects

Disturbance of the habitat types within the project area is likely to impact migratory birds. Native habitats are being lost directly with the construction of wells, roads, and pipelines. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Human activities likely displace migratory birds farther than simply the physical habitat 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).

Density of breeding Brewer's sparrows declined by 36% within 100 m of dirt roads within a natural gas field. Effects occurred along roads with light traffic volume (<12 vehicles per day). Findings suggest that indirect habitat losses from energy development may be substantially larger than direct habitat losses (Ingelfinger 2004).

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

4.2.3.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, Page 4-235.

4.2.4. Raptors Direct and Indirect Effects

Human activities in close proximity to active raptor nests may interfere with nest productivity. Romin and Muck (1999) indicate that activities within 0.5 miles of a nest are prone to cause adverse impacts to nesting raptors. If mineral activities occur during nesting, they could be sufficient to cause adult birds to remain away from the nest and their chicks for the duration of the activities. This absence can lead to over heating or chilling of eggs or chicks. The prolonged disturbance can also lead to the abandonment of the nest by the adults. Both actions can result in egg or chick mortality. In addition, routine human activities near these nests can draw increased predator activity to the area and increase nest predation. Additional direct and indirect impacts to raptors, from oil and gas development, are analyzed in the PRB FEIS (4-216-221).

Table 4.2. Wells within close proximity to documented raptor nests within the project area (Timing limitations will apply to these features).

BLM ID	UTM_E	UTM_N	SEC	TWP	RNG	SPECIES	SUBSTRATE	PROJECT FEATURES
725	444231	4935122	24	53	74	Red-tailed Hawk	Cottonwood	21-24
3228	440370	4936215	15	53	74	Great-horned Owl	Cottonwood	21-15, 32-15, 12-15
3229	439340	4935488	16	53	74	Red-tailed Hawk	Juniper	14-15
4617	438185	4935612	17	53	74	Great-horned Owl	Juniper	32-17, 43-17, 34-17, Jacobs Reservoir
4828	444225	4935109	24	53	74	Great-horned Owl	Box Elder	21-24
4829	444275	4935117	24	53	74	Red-tailed Hawk	Box Elder	21-24
None	436353	4935531	18	53	75	American Kestrel	Bank	43-18
None	438212	4936994	8	53	75	American Kestrel	Unknown	14-9
None	435966	4935992	18	53	75	American Kestrel	Unknown	32-18

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a one-half mile radius timing limitation during the breeding season around active raptor nests and recommends all infrastructure requiring human visitation to be located greater than one-quarter mile from occupied raptor nests. At the onsite the 43-18 was moved out of line of sight of the American kestrel nest.

4.2.4.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-221. No additional mitigation measures are required.

4.2.5. Threatened and Endangered and Sensitive Species

Within the BLM Buffalo Field Office there are two species that are Threatened or Endangered under the Endangered Species Act. Potential project effects to Threatened and Endangered Species are provided in Table 4.3. and further discussed following the table.

4.2.5.1. Threatened and Endangered and Sensitive Species

Table 4.3 Summary of Threatened and Endangered Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Endangered				
Black-footed ferret (*Mustela nigripes*)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	Small prairie dog towns present.
Threatened				
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Riparian areas with permanent water	NP	NE	No known populations. No discharge to perennial streams.

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

4.2.5.1.1. Black-footed ferret

The proposed development will have **no effect** on the black-footed ferret. The species is not present in the action area and future recovery efforts, if they occur, will not be impacted. The proposed action will not impact prairie dog colonies.

4.2.5.1.2. Ute's Ladies'-Tresses Orchid

The POD was surveyed for suitable habitat and none was identified. The proposed action will fully contain produced water in reservoirs placed in ephemeral draws. The proposed action will have **no effect** on the Ute ladies'-tresses orchid.

4.2.5.2. Sensitive Species Direct and Indirect Effects

Table 4.4 Summary of Sensitive Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Amphibians				
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	S	MIIH	Additional water will affect existing waterways.
Spotted frog (*Ranus pretiosa*)	Ponds, sloughs, small streams	NP	NI	Prairie not mountain habitat.
Birds				
Bald eagle (*Haliaeetus leucocephalus)*	Mature forest cover often within one mile of large water body.	K	MIIH	Overhead power proposed.
Baird's sparrow (*Ammodramus bairdii*)	Grasslands, weedy fields	S	MIIH	Sagebrush cover will be affected.
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	K	MIIH	Sagebrush cover will be affected.
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	S	MIIH	Prairie dog colony present.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	S	MIIH	Grassland will be impacted.
Greater sage-grouse (*Centrocercus urophasianus*)	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Sagebrush cover will be affected.
Loggerhead shrike (*Lanius ludovicianus*)	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Sagebrush cover will be affected.
Long-billed curlew (*Numenius americanus*)	Grasslands, plains, foothills, wet meadows	NP	NI	Habitat not present.
Mountain plover (*Charadrius montanus*)	Short-grass prairie with slopes < 5%	NP	NI	Habitat not present.
Northern goshawk (*Accipiter gentilis*)	Conifer and deciduous forests	NP	NI	No forest habitat present.
Peregrine falcon (*Falco peregrinus*)	cliffs	NP	NI	No nesting habitat present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Sage sparrow (*Amphispiza billneata*)	Basin-prairie shrub, mountain-foothill shrub	NP	NI	Sagebrush cover will be affected.
Sage thrasher (*Oreoscoptes montanus*)	Basin-prairie shrub, mountain-foothill shrub	K	MIIH	Species heard at onsite. Sagebrush cover will be affected.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	S	MIIH	Reservoirs may provide migratory habitat.
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	NP	NI	Permanently wet meadows not present.
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	NP	NI	Streamside habitats not present
Fish				
Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*)	Mountain streams and rivers in Tongue River drainage	NP	NI	Outside species range.
Mammals				
Black-tailed prairie dog (*Cynomys ludovicianus*)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	K	NI	Prairie dog towns will not be affected.
Fringed myotis (*Myotis thysanodes*)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (*Myotis evotis*)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Spotted bat (*Euderma maculatum*)	Cliffs over perennial water.	NP	NI	Cliffs & perennial water not present.
Swift fox (*Vulpes velox*)	Grasslands	NP	MIIH	Habitat not present.
Townsend's big-eared bat (*Corynorhinus townsendii*)	Caves and mines.	NP	NI	Habitat not present.
Plants				
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NP	NI	Habitat not present.

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

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

4.2.5.2.1. Bald eagle

There are 6.4 miles of proposed overhead distribution lines within the project area. All proposed power will be constructed in compliance with the 2006 Avian Power Line Interaction Committee's (APLIC) suggested practices and with the Service's standards (USFWS 2007). There is existing power in the project area serving ranch operations and conventional oil wells. These older lines may not be in compliance with current APLIC standard. Where Black Diamond proposes to tie into these existing lines, the existing pole that is used shall be upgraded to meet 2006 APLIC standards.

The presence of overhead power lines and roads may adversely affect foraging bald eagles. Bald eagles forage opportunistically throughout the Powder River Basin particularly during the winter when migrant eagles join the small number of resident eagles. Power poles provide attractive perch sites in areas where mature trees and other natural perches are lacking. From May 2003, through August 14, 2007, Service Law Enforcement salvage records for northeast Wyoming identified that 180 raptors, including 1 bald eagle, 106 golden eagles, 1 unidentified eagle, 28 hawks, 44 owls and 8 unidentified raptors and 1 great-blue heron were electrocuted on power poles within the Powder River Basin Oil and Gas Project area (USFWS 2007). Of the 180 raptors electrocuted 58 were at power poles that are considered new construction (post 1996 construction standards). Additionally, two golden eagles and a Cooper's hawk were killed in apparent mid span collisions with powerlines (USFWS 2006a). Power lines not constructed to APLIC suggestions pose an electrocution hazard for eagles and other raptors perching on them; the Service has developed additional specifications improving upon the APLIC suggestions. Constructing power lines to the APLIC suggestions and Service standards minimizes but does not eliminate electrocution risk.

Roads present a collision hazard, primarily from bald eagles scavenging on carcasses resulting from other road related wildlife mortalities. Collision risk increases with automobile travel speed. Typically two-tracks and improved project roads pose minimal collision risk In one year of monitoring road-side carcasses the BLM Buffalo Field Office reported 439 carcasses, 226 along Interstates (51%), 193 along paved highways (44%), 19 along gravel county roads (4%), and 1 along an improved CBNG road (<1%) (Bills 2004). No road-killed eagles were reported; eagles (bald and golden) were observed feeding on 16 of the reported road-side carcasses (<4%). The proposed project will increase traffic on Sate Highways 387 and 50, which may result in bald eagle / vehicle strikes in the winter when migratory eagles are in the area.

4.2.5.2.2. Black-tailed prairie dog

The proposed action will not impact black-tailed prairie dog colonies.

4.2.5.2.3. Greater sage-grouse

Greater sage-grouse habitat is being directly lost with the addition of well sites, roads, pipelines, power lines, reservoirs and other infrastructure. Sage grouse avoidance of CBNG infrastructure results in even greater indirect habitat loss. The Wyoming Game and Fish Department (WGFD) feels a well density of eight wells per section creates a high level of impact for sage grouse and that sage-grouse avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004).

The presence of overhead power lines and roads within the project area may adversely affect sage grouse. Overhead power lines create hunting perches for raptors, thus increasing the potential for predation on sage grouse. Increased predation from overhead power near leks may cause a decrease in lek attendance and possibly lek abandonment. Overhead power lines are also a collision hazard for sage grouse flying through the area. Increased roads and mineral related traffic can affect grouse activity and reduce survival (Braun et al. 2002). Activity along roads may cause nearby leks to become inactive over time (WGFD 2003).

Noise can affect sage grouse by preventing vocalizations that influence reproduction and other behaviors

(WGFD 2003). Sage grouse attendance on leks within one mile of compressors is lower than for sites farther from compressors locations (Braun et al. 2002).

Another concern with CBNG is that reservoirs created for water disposal provide habitat for mosquitoes associated with West Nile virus (Oedekoven 2004). West Nile virus represents a significant new stressor which in 2003 reduced late summer survival of sage-grouse an average of 25% within four populations including the Powder River Basin (Naugle et al. 2004). Powder River Basin grouse losses during 2004 and 2005 were not as severe. Summer 2003 was warm and dry, more conducive to West Nile virus replication and transmission than the cooler summers of 2004 and 2005 (Cornish pers. Comm..).

The Buffalo Field Office (BFO) Resources Management Plan (BLM 2001) and the Powder River Basin Oil and Gas Project Record of Decision (BLM 2003) include a two-mile timing limitation within sage-grouse nesting habitat. The two-mile measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA), which includes the WGFD, 1977 sage-grouse guidelines (Bennett 2004). Under pressure for standardization BLM Wyoming adopted the two-mile recommendation in 1990, and instructed the field offices to incorporate the measure into their land use plans (Bennett 2004, Murkin 1990). Table 4.5 identifies known leks within 2 miles of the project and elements of the project that may affect sage-grouse nesting. Timing limitations will be applied to those elements.

Table 4.5 Known leks within 2 miles of the project.

LEK_NAME	QQ	Q	SEC	TWN	RNG	ZONE	EASTING	NORTHING
Colton	NE	SW	32	53	74	13	437309	4930528
Fitch Pro	NE	SW	5	53	75	13	437352	4939109
Playa	SW	SW	12	53	75	13	433858	4937162
Ridgetop	SE	NW	5	53	74	13	437300	4939400

The two-mile recommendation was based on research which indicated between 59 and 87 percent of sage-grouse nests were located within two-miles of a lek (Bennett 2004). These studies were conducted within prime, contiguous sage-grouse habitat such as Idaho's Snake River plain.

Additional studies, across more of the sage-grouse's range, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported only 45% of their sage grouse hens nested within 3 km (1.86 mi) of the capture lek. Moynahan and Lindberg (2004) found 36% of their grouse nesting within 3 km of the capture leks. Moynahan's study area was north-central Montana in an area of mixed-grass prairie and sagebrush steppe, with Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) being the dominant shrub species (Moynahan et al. In press).

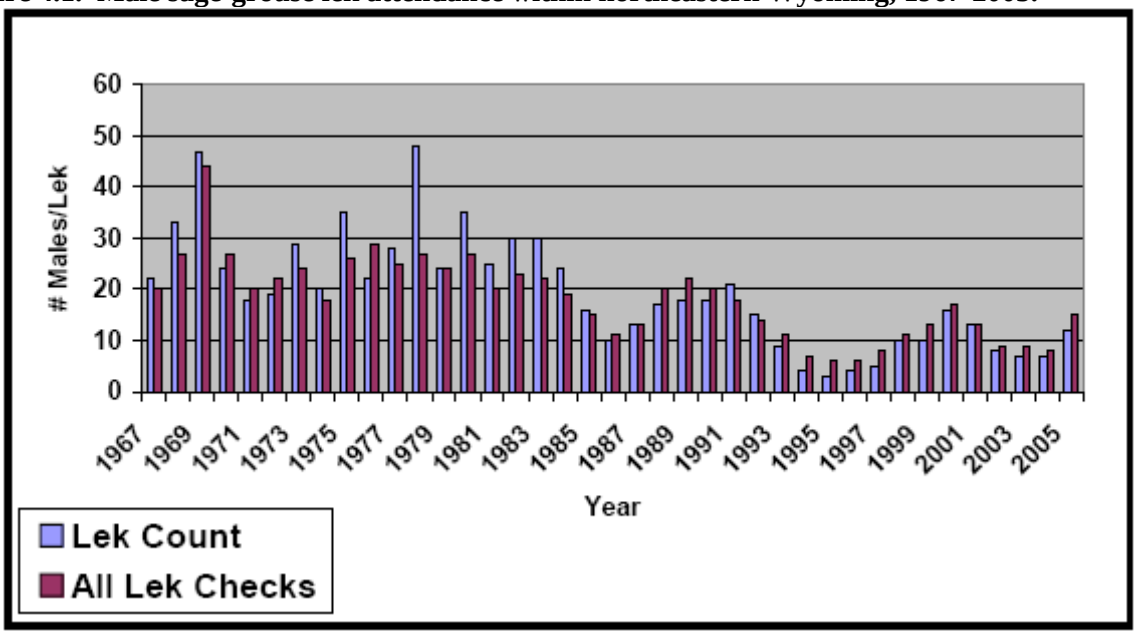
Percentage of sage-grouse nesting within a certain distance from their breeding lek is unavailable for the Powder River Basin. The Buffalo and Miles City field offices through the University of Montana with assistance from other partners including the U.S. Department of Energy and industry are currently researching nest location and other sage-grouse questions and relationships between grouse and coalbed natural gas development. Habitat conditions and sage grouse biology within the Buffalo Field Office is probably most similar to Moynahan's north-central Montana study area.

Vegetation communities within the Powder River Basin are naturally fragmented as they represent a transition between the intermountain basin sagebrush communities to the west and the prairie communities to the east. The Powder River Basin is also near the eastern edge of greater sage-grouse

range. Without contiguous habitat available to nesting grouse it is likely a smaller percentage of grouse nest within two-miles of a lek within the PRB than grouse within those areas studied in the development of the 1977 WAFWA recommendations and even the Holloran and Moynahan study areas. Holloran and Moynahan both studied grouse in areas of contiguous sagebrush habitats without large scale fragmentation and habitat conversion (Moynahan et al In press, Holloran and Anderson 2005). A recent sagebrush cover assessment within Wyoming basins estimated sagebrush coverage within Hollaran and Anderson's Upper Green River Basin study area to be 58% with an average patch size greater than 1200 acres; meanwhile Powder River Basin sagebrush coverage was estimated to be 35% with an average patch size less than 300 acres (Rowland et al. 2005). The Powder River Basin patch size decreased by more than 63% in forty years, from 820 acre patches and an overall coverage of 41% in 1964 (Rowland et al. 2005). Recognizing that many populations live within fragmented habitats and nest much farther than two miles from the lek of breeding WAFWA revised their sage grouse management guidelines (Connelly et. al. 2000) and now recommends the protection of suitable habitats within 5 km (3.1 mi) of leks where habitats are not distributed uniformly such as the Powder River Basin.

The sage grouse population within northeast Wyoming is exhibiting a steady long term downward trend (Figure 1) (Thiele 2005). The figure illustrates a ten year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak and each periodic low is lower than the previous population low. Long-term harvest trends are similar to that of lek attendance (Thiele 2005).

Figure 4.1. Male sage-grouse lek attendance within northeastern Wyoming, 1967-2005.



Sage-grouse populations within the PRB are declining independent of coalbed natural gas development. CBNG is a recent development, with the first well drilled in 1987 (Braun et al. 2002). In February 1998 there were 420 producing wells primarily restricted to eastern Campbell County (BFO 1999). By May 2003 there were 26,718 CBNG wells permitted within the BFO area (Oedekoven 2004). The Powder River Basin Oil and Gas Project Final Environmental Impact Statement estimated 51,000 additional CBNG wells to be drilled over a ten year period beginning in 2003 (BFO 2003). Impacts from CBNG development are likely to be significant and additive to the long-term impacts afflicting the sage-grouse population (Oedekoven 2004). In other terms, CBNG development is expected to accelerate the downward sage-grouse population trend.

A two-mile timing limitation given the long-term population decline and that less than 50% of grouse are expected to nest within the limitation area is insufficient to reverse the population decline. Moynahan and Lindberg (2004) like WAFWA (Connely et al. 2000) recommend increasing the protective distance around sage grouse leks. Even with a timing limitation on construction activities, sage-grouse may avoid nesting within CBNG fields because of the activities associated with operation and production. As stated earlier, a well density of eight wells per section creates sage-grouse avoidance zones which overlap creating contiguous avoidance areas (WGFD 2004).

An integrated approach including habitat restoration, grazing management, temporal and spatial mineral limitations etc. is necessary to reverse the population decline. The Wyoming Game and Fish Department (WGFD) has initiated such a program within the Buffalo Field Office area (Jellison 2005). The WGFD program is modeled after a successful program on the Deseret Ranch in southwestern Wyoming and northeastern Utah. The Deseret Ranch has demonstrated a six-fold increase in their sage-grouse population while surrounding areas exhibited decreasing populations (Danvir 2002).

The operator worked with the BLM to avoid breeding and nesting habitats wherever possible. If physical impacts were unavoidable then they were reduced.

4.2.5.2.4. Mountain plover

The limited suitable mountain plover habitat that was identified within the project will not be impacted by the proposed action.

4.2.5.3. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-271.

4.3. West Nile Virus Direct and Indirect Effects

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

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

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

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

4.4. Water Resources

The operator has submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts within the Upper Powder River and the Little Powder River

watersheds and a commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Qualified hydrologists 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 WDEQ has assumed primacy from United States Environmental Protection Agency for maintaining the water quality in the waters of the state. The WSEO has authority for regulating water rights issues and permitting impoundments for the containment of surface waters of the state.

The maximum water production is predicted to be 5.0 gpm per well or 585 gpm (1.3 cfs or 944 acre-feet per year) for this POD. The PRB FEIS projected the total amount of water that was anticipated to be produced from CBNG development per year (Table 2-8 Projected Amount of Water Produced from CBM Wells Under Alternatives 1, 2A and 2B pg 2-26). For the Upper Powder River drainage, the projected volume produced within the watershed area was 163,521 acre-feet in 2007 (maximum production was estimated in 2006 at 171,423 acre-feet). As such, the volume of water resulting from the production of these wells is less than 1% of the total volume projected for 2007. For the Little Powder River drainage, the projected volume produced within the watershed area was 18,607 acre-feet in 2007 (maximum production was estimated in 2005 at 22,427 acre-feet). As such, the volume of water resulting from the production of these wells is less than 5% of the total volume projected for 2007. Both watersheds are analyzed here using the potential maximum production for this plan because the operator proposes to tie together all wells and outfalls so that the full proposed production could go to either drainage or be split between them. In any event, this volume of produced water is also within the predicted parameters of the PRB FEIS.

4.4.1. Groundwater

The PRB FEIS predicts an infiltration rate of 40% to groundwater aquifers and coal zones in the Upper Powder River drainage area and 34% in the Little Powder (PRB FEIS pg 4-5). For this action, it may be assumed that a maximum of 234 gpm in the Upper Powder and 200 gpm in the Little Powder river basins will infiltrate at or near the discharge points and impoundments (377 to 322 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 pg 4-54). However, there is potential for infiltration of produced water to influence the quality of the antecedent groundwater. The WDEQ requires that operators determine initial groundwater quality below impoundments to be used for CBNG produced water storage. If high quality water is detected (Class 3 or better) the operator is required to establish a groundwater monitoring program at those impoundments.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is impacts to the groundwater. "The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of wells in the area. The permitted water wells produce from depths which range from 120 to 900 feet below the ground surface compared to an average of 1071 feet to the Lower Canyon and an average of 1366 feet to the Wall. As mitigation, the operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence (½ mile of a federal CBNG producing well) of the proposed wells.

Recovery of the coal bed aquifer was predicted in the PRB FEIS to "…resaturate and repressurize the areas that were partially depressurized during operations. The amount of groundwater storage within the

coals and sands units above and below the coals is enormous. Almost 750 million acre-feet of recoverable groundwater are stored within the Wasatch - Tongue River sand and coals (PRB FEIS Table 3-5). Redistribution is projected to result in a rapid initial recovery of water levels in the coal. The model projects that this initial recovery period would occur over 25 years." (PRB FEIS page 4-38).

Adherence to the drilling plan, the setting of casing at appropriate depths, following safe remedial procedures in the event of casing failure, and utilizing proper cementing procedures will protect any potential 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.

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

Shallow ground water monitoring is ongoing at impoundment sites across the basin. Due to the limited data available from these sites, the still uncertain overall fate or extent of change that is occurring due to infiltration at those sites, and the extensive variable site characteristics both surface and subsurface, it is not reliable at this time to infer that findings from these monitoring wells should be directly applied to other impoundment locations across the basin.

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004, and is currently being revised as the "Compliance Monitoring and Siting Requirements for Unlined Coalbed Methane Produced Water Impoundments" which should be approved by June, 2006. Approximately 800 new impoundments have been investigated to date with 102 impoundments in 52 permits that have gone into compliance monitoring. The Wyoming DEQ has established an Impoundment Task Force which is in the process of drafting an "Impoundment Monitoring Plan" to investigate the potential for existing impoundments to have impacted shallow groundwater. Drilling at selected existing impoundments should begin in the spring of 2006. For WYPDES permits received by DEQ after the August 1st effective date, the BLM will require that operators comply with the requirements outlined in the current approved DEQ compliance monitoring guidance document prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

4.4.1.1. Groundwater Cumulative Effects:

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

Development of CBNG through 2018 (and coal mining through 2033) would remove 4 million acre-feet of groundwater from the coal zone aquifer (PRB FEIS page 4-65). This volume of water "…cumulatively represents 0.5 percent of the recoverable groundwater stored in the Wasatch – Tongue River sands and coals (nearly 750 million acre-feet, from Table 3-5). All of the groundwater projected to be removed during reasonably foreseeable CBNG development and coal mining would represent less than 0.3 percent of the total recoverable groundwater in the Wasatch and Fort Union Formations within the PRB (nearly 1.4 billion acre-feet, from Table 3-5)." (PRB FEIS page 4-65). No additional mitigation is necessary.

4.4.2. Surface Water

The following table shows Wyoming proposed numeric limits for the watersheds for SAR, and EC, the average value measured at selected USGS gaging stations at high and low monthly flows, and Wyoming groundwater quality standards for TDS and SAR for Class I to Class III water. It also shows pollutant limits for TDS, SAR and EC detailed in the WDEQ's WYPDES permits, and the levels found in the POD's representative water sample.

Table 4.5 Comparison of Regulated Water Quality Parameters to Predicted Water Quality

Predicted Values	**TDS, mg/l**	**SAR**	**EC,** µmhos/cm
Most Restrictive Proposed Limit –			
Powder River		2	1000
Little Powder River		3	1000
Least Restrictive Proposed Limit			
Powder River		10	3200
Little Powder River		10	3000
Powder River at Arvada, WY Gauging station			
Historic Data Average at Maximum Flow		4.76	1797
Historic Data Average at Minimum Flow		7.83	3400
Little Powder River ab Dry Ck nr Weston, WY			
Historic Data Average at Maximum Flow		4.44	1785
Historic Data Average at Minimum Flow		6.94	3300
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	8	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0052710		SEE TABLE	SEE TABLE
At discharge point	5000	BELOW	BELOW
WDEQ Water Quality Requirement for WYPDES Permit # WY0055409	NOT	NOT	
At discharge point	STATED	STATED	3260
Predicted Produced Water Quality			
Lower Canyon	1090	12.1	1750
Wall	1020	12.9	1660
Lower Canyon & Wall	669	10.9	1090

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the Powder River Basin is the irrigation of crops (PRB FEIS pg 4-69). The water quality projected for this POD is 1090.0 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). If at any future time the operator entertains the possibility of irrigation or land application with the water produced from these wells, the proposal must be submitted as a sundry notice for separate environmental analysis and approval by the BLM.

The quality for the water produced from the Lower Canyon and Wall coal zones from these wells is predicted to be similar to the sample water quality collected from a location near the POD. A maximum of 5.0 gallons per minute (gpm) is projected is to be produced from these 117 wells, for a total of 585 for the POD.

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

There are 16 discharge points proposed for this project. They have been appropriately sited and utilize appropriate water erosion dissipation designs. Existing and proposed water management facilities were evaluated for compliance with best management practices during the onsite.

To manage the produced water, 16 impoundments (152 acre feet) have been or would be constructed within the project area. These impoundments will disturb approximately 40 acres including the dam structures. All of these water impoundments are or would be on-channel reservoirs. Existing impoundments will be upgraded and proposed impoundments will be constructed to meet the requirements of the WSEO, WDEQ and the needs of the operator and the landowner. All water management facilities were evaluated for compliance with best management practices during the onsite.

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow (PRB FEIS pg 4-74). Consequently, the volume of water produced from these wells may result in the addition of 0.2 cfs below the lowest reservoir (after infiltration and evapotranspiration losses), if all water were to be discharged to storage impoundments. (Water discharged to impoundments in the Wildcat Creek watershed may be released periodically, according to the "Water Administration Plan" approved for that drainage and attached as Appendix A to WYPDES permit WY0052710.) The operator has 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. Phased reclamation plans for the impoundments will be submitted and approved on a site-specific, case-by-case basis as they are no longer needed for disposal of CBNG water, as required by BLM applied COAs.

Alternative (2A), 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 with a total contribution to the mainstem of the Upper Powder River of 68 cfs (PRB FEIS pg 4-85 to 4-87) and in 2005 with a total contribution to the Little Powder River of 13 cfs (PRB FEIS pg 4-108 to 4-115). The predicted maximum discharge rate from these 105 wells is anticipated to be a total of 585 gpm or 1.3 cfs to impoundments. Using an assumed conveyance loss of 20% (PRB FEIS pg 4-74) and full containment within the Upper Powder River watershed, the produced water re-surfacing in the Powder River from this action (0.2 cfs) could add a maximum 0.16 cfs to the Powder River flows, or 0.3% of the predicted total CBNG produced water contribution. If all water were discharged for full containment into the Little Powder River watershed, the produced water re-surfacing in the Little Powder River from this action (0.2 cfs) could add a maximum of 0.16 cfs to the Little Powder river flows, or 1.5% of the predicted total CBNG produced water contribution. This incremental volume is statistically below the measurement capabilities for the volume of flow in river systems such as the Powder and Little Powder rivers (refer to Statistical Methods in Water Resources U.S. Geological Survey, Techniques of Water-Resources Investigations Book 4, Chapter A3 2002, D.R. Helsel and R.M. Hirsch authors). For more information regarding the maximum predicted water impacts resulting from the discharge of produced water, see Table 4-6 (PRB-FEIS pg 4-85).

In the WMP portion of the POD, the operator provided an analysis of the potential development in the watershed above the project area (WMP pages 9 and 10). Based on the combined area of the Wildcat Creek and Middle Prong of Wild Horse Creek watersheds above the POD (1.8 sq mi) and an assumed density of one well per location every 80 acres, the potential exists for the development of 14-15 wells which could produce a maximum flow rate of 70-75 gpm (0.16 cfs) of water. The BLM agrees with the operator that this is not expected to occur because:

1. Some of these wells have already been drilled and are producing.
2. New wells will be phased in over several years, and

3. A decline in well discharge generally occurs after several months of operation.

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 has obtained two Wyoming Pollutant Discharge Elimination System (WYPDES) permits for the discharge of water produced from this project from the WDEQ.

For permit WY0052710, effluent limits were set at Part I, page 2.

The WYPDES permit also addresses existing downstream concerns, such as irrigation use, in the COA for the permit. The designated point of compliance identified for this permit is the end of the discharge pipe.

WY0052710 (discharge to Wildcat Creek)	Daily Max at the outfall	Daily Maximum Attenuation zone
Chlorides, mg/l	46	
Dissolved Iron, µg/l	1000	
Dissolved Manganese, µg/l	718	
Dissolved Copper, µg/l	14.6	
Dissolved Lead, µg/l	7.7	
pH, standard units	6.5 - 9.0	
Dissolved Sodium, mg/l, March-October	270	
Dissolved Sodium, mg/l, November-February	350	
Specific Conductance, µS/cm, (flow at Div1 =>20 cfs)	2500	
Specific Conductance, µS/cm, (flow at Div1 <20 cfs)	7500	
Sulfates, mg/l	3000	
Total Arsenic, µg/l	3.6	
Total Barium, µg/l	1800	
Total Dissolved Solids, mg/l	5000	
SAR, calculated (flow at Div1=>20 cfs)	N/A	(7.1 x EC dS/m) - 2.48
SAR, calculated (flow at Div1<20 cfs)	N/A	N/A

For permit WY0055409, effluent limits were set at Part I, page 1.

WY0055409 (disch to Middle Prong Wild Horse Ck)	Daily Max at the outfall
Chlorides, mg/l	150
Dissolved Iron, µg/l	1000
pH, standard units	6.5 - 9.0
Specific Conductance	3260
Total Recoverable Arsenic, µg/l	8.4
Total Recoverable Barium, µg/l	1800
Total Flow, Million Gallons per Day	0.26

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

wellhead for analysis within sixty days of initial production. A copy of the water analysis will be submitted to the BLM Authorized Officer.

As stated previously, the operator has committed to offer water well agreements to properly permitted domestic and stock water wells within the circle of influence of the proposed CBNG wells.

The development of coal bed natural gas and the production and discharge of water in the area surrounding the existing natural springs may affect their flow rate and/or water quality.

In-channel downstream impacts are addressed in the WMP for the Long Draw Unit II POD prepared by CBM Associates, Incorporated, for Williams Production RMT Company.

4.4.2.1. Surface Water Cumulative Effects

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

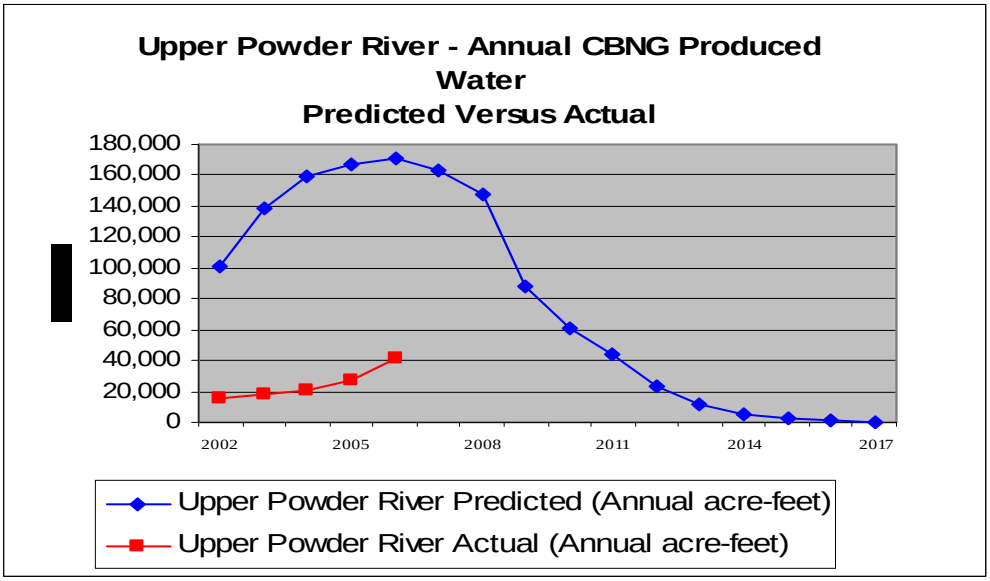
As of December 2006 all producing CBNG wells in the Upper Powder River watershed have discharged a cumulative volume of 123,984 acre-ft of water compared to the predicted 736,519 acre-ft disclosed in the PRB FEIS (Table 2-8 page 2-26). These figures are presented graphically in Figure 4.1 and Table 4.6 following. This volume is 17 % of the total predicted produced water analyzed in the PRB FEIS for the Upper Powder River watershed.

Table 4.6 Actual vs predicted water production in the Upper Powder River watershed *2006 Data Update 3-16-07*

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				
2008	147,481	1,047,521				
2009	88,046	1,135,567				
2010	60,319	1,195,886				
2011	44,169	1,240,055				
2012	23,697	1,263,752				
2013	12,169	1,275,921				
2014	5,672	1,281,593				
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				

			Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
Total	**1,285,233**		**123,984**			

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



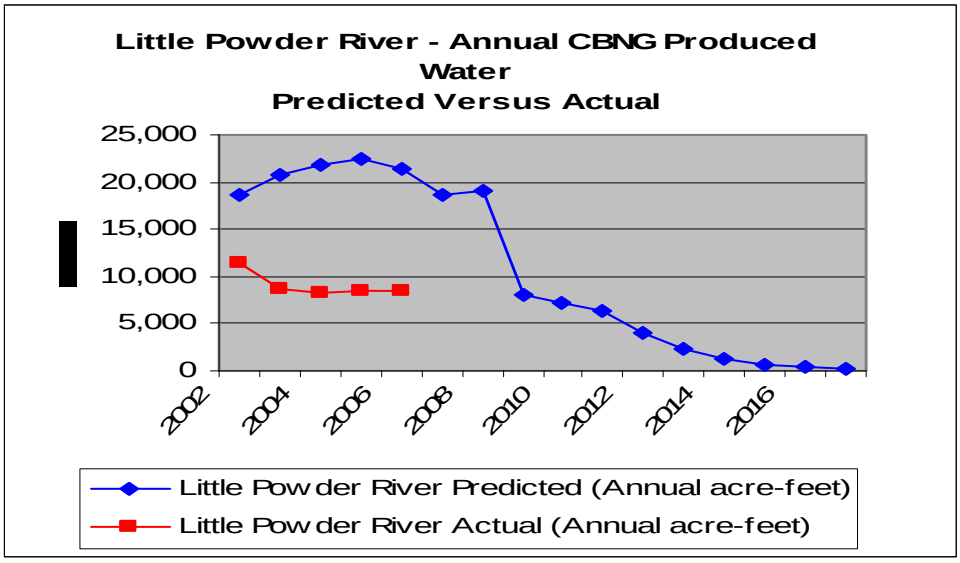
As of December 2006 all producing CBNG wells in the Little Powder River watershed have discharged a cumulative volume of 45,336 acre-ft of water compared to the predicted 105,024 acre-ft disclosed in the PRB FEIS (Table 2-8 page 2-26). These figures are presented graphically in Figure 4.2 and Table 4.7 following. This volume is 43 % of the total predicted produced water analyzed in the PRB FEIS for the Upper Powder River watershed.

Table 4.7 Actual vs predicted water production in the Little Powder River watershed *2006 Data Update 3-16-07*

Year	Little Powder River Predicted (Annual acre-feet	Little Powder River Predicted (Cumulative acre-feet from 2002)	Little Powder River Actual (Annual acre-feet)		Little Powder River Actual (Cumulative acre-feet from 2002)	
			Actual Ac-ft	% of Predicted	Cum Ac-ft	% of Predicted
2002	18,613	18,613	11,391	61.2	11,391	61.2
2003	20,822	39,435	8,767	42.1	20,158	51.1
2004	21,832	61,267	8,266	37.9	28,424	46.4
2005	22,427	83,694	8,529	38.0	36,953	44.2
2006	21,330	105,024	8,383	39.3	45,336	43.2

			Little Powder River Actual (Annual acre-feet)		Little Powder River Actual (Cumulative acre-feet from 2002)	
2007	18,607	123,631				
2008	19,121	142,752				
2009	8,016	150,768				
2010	7,124	157,892				
2011	6,439	164,331				
2012	3,930	168,261				
2013	2,340	170,601				
2014	1,335	171,936				
2015	699	172,635				
2016	350	172,985				
2017	133	173,118				
Total	**173,118**		**45,336**			

Figure 4.2 Actual vs predicted water production in the Little Powder River watershed



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

The PRB FEIS states, "Cumulative effects to the suitability for irrigation of the Powder River would be minimized through the interim Memorandum of Cooperation (MOC) that the Montana and Wyoming DEQ's (Departments of Environmental Quality) have signed. This MOC was developed to ensure that designated uses downstream in Montana would be protected while CBM development in both states

continued. As the two states develop a better understanding of the effects of CBM discharges through the enhanced monitoring required by the MOC, they can adjust the permitting approaches to allow more or less discharges to the Powder River drainage. Thus, through the implementation of in-stream monitoring and adaptive management, water quality standards and interstate agreements can be met." (PRB FEIS page 4-117) However, current litigation between Wyoming and Montana may eventually determine the water quality and quantity parameters which will be applied to CBNG produced water disposal in the PRB.

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 and Little Powder River drainages and the total amounts that were predicted in the PRB FEIS for each watershed, which are approximately 17% and 43%, respectively, of those totals (see section 4.4.2.1).
2. The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
3. The commitment by the operator to monitor the volume of water discharged.

No additional mitigation measures are required.

Refer to the PRB FEIS, Volume 2, starting on page 4-92, for a discussion and analysis of surface water impacts at the Wyoming/Montana state line. The "Cumulative Surface Water Impact Analysis" applicable to both states begins on page 4 – 117

4.5. Cultural Resources

The partial cultural inventory was field checked on 7/23/07. Due to unusually heavy vegetation cover and later access concerns by a landowner (hunting season), the Bureau did not have the opportunity to perform compliance checks for the majority of the cultural inventory. Further compliance checks will be performed during the pre-construction onsite. If any cultural resources are discovered during the compliance checks, they will be treated a discovery as outlined in Standard Condition of Approval #1 of the EA.

There are no documented eligible sites within the APE of the proposed project. Non eligible sites 48CA2130 and 48CA5273 will not be impacted by this project. Following the Wyoming State Protocol Section VI(A)(1) the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 9/27/07 that no historic properties exist within the APE.

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).

5. CONSULTATION/COORDINATION

Contact	Title	Organization	Present at Onsite
Mary White	Interim SHPO	SHPO	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 Record of Decision.

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