

**FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Williams Production RMT Co.
Carr Draw II Additions II
ENVIRONMENTAL ASSESSMENT –WY-070-EA07-023**

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Williams Production RMT Co.'s Carr Draw II Additions II Coal Bed Natural Gas (CBNG) POD comprised of the following 96 Applications for Permit to Drill (APDs), as follows:

	Well Name	Well #	Qtr/Qtr	Sec	Twp	Rng	Lease #
1	CARR DRAW II ADD II J MAYCOCK	32-2BG	SWNE	2	49N	75W	WYW147302
2	CARR DRAW II ADD II J MAYCOCK	32-2GW	SWNE	2	49N	75W	WYW147302
3	CARR DRAW II ADD II THRONE	23-3GW	NESW	3	50N	75W	WYW162026
4	CARR DRAW II ADD II THRONE	34-3GW	SWSE	3	50N	75W	WYW162026
5	CARR DRAW II ADD II THRONE	43-3GW	NESE	3	50N	75W	WYW162026
6	CARR DRAW II ADD II M MAYCOCK	23-4BG	NESW	4	49N	75W	WYW149966
7	CARR DRAW II ADD II M MAYCOCK	23-4GW	NESW	4	49N	75W	WYW149966
8	CARR DRAW II ADD II M MAYCOCK	32-4BG	SWNE	4	49N	75W	WYW149966
9	CARR DRAW II ADD II M MAYCOCK	32-4GW	SWNE	4	49N	75W	WYW149966
10	CARR DRAW II ADD II M MAYCOCK	34-4BG	SWSE	4	49N	75W	WYW149966
11	CARR DRAW II ADD II M MAYCOCK	34-4GW	SWSE	4	49N	75W	WYW149966
12	CARR DRAW II ADD II FEDERAL	43-4BG	NESE	4	49N	75W	WYW149966
13	CARR DRAW II ADD II FEDERAL	43-4GW	NESE	4	49N	75W	WYW149966
14	CARR DRAW II ADD II FEDERAL	12-5GW	SWNW	5	49N	75W	WYW149966
15	CARR DRAW II ADD II FEDERAL	12-5BG	SWNW	5	49N	75W	WYW149966
16	CARR DRAW II ADD II FEDERAL	21-5BG	NENW	5	49N	75W	WYW149966
17	CARR DRAW II ADD II FEDERAL	21-5GW	NENW	5	49N	75W	WYW149966
18	CARR DRAW II ADD II M MAYCOCK	12-11BG	SWNW	11	49N	75W	WYW147302
19	CARR DRAW II ADD II M MAYCOCK	12-11GW	SWNW	11	49N	75W	WYW147302
20	CARR DRAW II ADD II M MAYCOCK	14-11BG	SWSW	11	49N	75W	WYW147302
21	CARR DRAW II ADD II M MAYCOCK	14-11GW	SWSW	11	49N	75W	WYW147302
22	CARR DRAW II ADD II M MAYCOCK	21-11BG	NENW	11	49N	75W	WYW147302
23	CARR DRAW II ADD II M MAYCOCK	21-11GW	NENW	11	49N	75W	WYW147302
24	CARR DRAW II ADD II M MAYCOCK	23-11BG	NESW	11	49N	75W	WYW147302
25	CARR DRAW II ADD II M MAYCOCK	23-11GW	NESW	11	49N	75W	WYW147302
26	CARR DRAW II ADD II M MAYCOCK	12-14BG	SWNW	14	49N	75W	WYW147306
27	CARR DRAW II ADD II M MAYCOCK	12-14GW	SWNW	14	49N	75W	WYW147306
28	CARR DRAW II ADD II M MAYCOCK	21-14BG	NENW	14	49N	75W	WYW147306
29	CARR DRAW II ADD II M MAYCOCK	21-14GW	NENW	14	49N	75W	WYW147306
30	CARR DRAW II ADD II CARU	14-21BG	SWSW	21	50N	75W	WYW154404
31	CARR DRAW II ADD II CARU	14-21GW	SWSW	21	50N	75W	WYW154404
32	CARR DRAW II ADD II CARU	23-21BG	NESW	21	50N	75W	WYW154404
33	CARR DRAW II ADD II CARU	23-21GW	NESW	21	50N	75W	WYW154404
34	CARR DRAW II ADD II CARU	34-21BG	SWSE	21	50N	75W	WYW154404
35	CARR DRAW II ADD II CARU	34-21GW	SWSE	21	50N	75W	WYW154404
36	CARR DRAW II ADD II CARU	43-21GW	NESE	21	50N	75W	WYW154404
37	CARR DRAW II ADD II CARU	43-21BG	NESE	21	50N	75W	WYW154404
38	CARR DRAW II ADD II M MAYCOCK	14-22GW	SWSW	22	50N	75W	WYW39563

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39	CARR DRAW II ADD II M MAYCOCK	23-22BG	NESW	22	50N	75W	WYW39563
40	CARR DRAW II ADD II M MAYCOCK	23-22GW	NESW	22	50N	75W	WYW39563
41	CARR DRAW II ADD II M MAYCOCK	34-22GW	SWSE	22	50N	75W	WYW39563
42	CARR DRAW II ADD II M MAYCOCK	14-23GW	SWSW	23	50N	75W	WYW39563
43	CARR DRAW II ADD II M MAYCOCK	34-23GW	SWSE	23	50N	75W	WYW39563
44	CARR DRAW II ADD II M MAYCOCK	14-26BG	SWSW	26	50N	75W	WYW128096
45	CARR DRAW II ADD II M MAYCOCK	14-26GW	SWSW	26	50N	75W	WYW128096
46	CARR DRAW II ADD II M MAYCOCK	23-26BG	NESW	26	50N	75W	WYW146810
47	CARR DRAW II ADD II M MAYCOCK	23-26GW	NESW	26	50N	75W	WYW146810
48	CARR DRAW II ADD II M MAYCOCK	34-26GW	SWSE	26	50N	75W	WYW146810
49	CARR DRAW II ADD II M MAYCOCK	12-27BG	SWNW	27	50N	75W	WYW125542
50	CARR DRAW II ADD II M MAYCOCK	12-27GW	SWNW	27	50N	75W	WYW125542
51	CARR DRAW II ADD II M MAYCOCK	14-27BG	SWSW	27	50N	75W	WYW125542
52	CARR DRAW II ADD II M MAYCOCK	14-27GW	SWSW	27	50N	75W	WYW125542
53	CARR DRAW II ADD II M MAYCOCK	43-27BG	NESE	27	50N	75W	WYW125542
54	CARR DRAW II ADD II M MAYCOCK	43-27GW	NESE	27	50N	75W	WYW125542
55	CARR DRAW II ADD II M MAYCOCK	11-27GW	NWNW	27	50N	75W	WYW146810
56	CARR DRAW II ADD II M MAYCOCK	23-27BG	NESW	27	50N	75W	WYW146810
57	CARR DRAW II ADD II M MAYCOCK	23-27GW	NESW	27	50N	75W	WYW146810
58	CARR DRAW II ADD II M MAYCOCK	32-27BG	SWNE	27	50N	75W	WYW146810
59	CARR DRAW II ADD II M MAYCOCK	32-27GW	SWNE	27	50N	75W	WYW146810
60	CARR DRAW II ADD II M MAYCOCK	34-27BG	SWSE	27	50N	75W	WYW146810
61	CARR DRAW II ADD II M MAYCOCK	34-27GW	SWSE	27	50N	75W	WYW146810
62	CARR DRAW II ADD II M MAYCOCK	41-27BG	NENE	27	50N	75W	WYW146810
63	CARR DRAW II ADD II M MAYCOCK	41-27GW	NENE	27	50N	75W	WYW146810
64	CARR DRAW II ADD II M MAYCOCK	12-28BG	SWNW	28	50N	75W	WYW146810
65	CARR DRAW II ADD II M MAYCOCK	12-28GW	SWNW	28	50N	75W	WYW146810
66	CARR DRAW II ADD II M MAYCOCK	14-28BG	SWSW	28	50N	75W	WYW146810
67	CARR DRAW II ADD II M MAYCOCK	14-28GW	SWSW	28	50N	75W	WYW146810
68	CARR DRAW II ADD II M MAYCOCK	23-28BG	NESW	28	50N	75W	WYW146810
69	CARR DRAW II ADD II M MAYCOCK	23-28GW	NESW	28	50N	75W	WYW146810
70	CARR DRAW II ADD II M MAYCOCK	43-28BG	NESE	28	50N	75W	WYW146810
71	CARR DRAW II ADD II M MAYCOCK	43-28GW	NESE	28	50N	75W	WYW146810
72	CARR DRAW II ADD II M MAYCOCK	43-29BG	NESE	29	50N	75W	WYW125979
73	CARR DRAW II ADD II M MAYCOCK	43-29GW	NESE	29	50N	75W	WYW125979
74	CARR DRAW II ADD II CARU	32-29BG	SWNE	29	50N	75W	WYW129538
75	CARR DRAW II ADD II CARU	32-29GW	SWNE	29	50N	75W	WYW129538
76	* CARR DRAW II ADD II CARU	42-29 BG	SENE	29	50N	75W	WYW129538
77	* CARR DRAW II ADD II CARU	42-29 GW	SENE	29	50N	75W	WYW129538
78	* CARR DRAW II ADD II CARU	42-29 SW	SENE	29	50N	75W	WYW129538
79	CARR DRAW II ADD II M MAYCOCK	23-29BG	NESW	29	50N	75W	WYW157699
80	CARR DRAW II ADD II M MAYCOCK	23-29GW	NESW	29	50N	75W	WYW157699
81	CARR DRAW II ADD II CARU	43-31BG	NESE	31	50N	75W	WYW146812
82	CARR DRAW II ADD II CARU	43-31GW	NESE	31	50N	75W	WYW146812
83	CARR DRAW II ADD II ME JONES	14-32BG	SWSW	32	50N	75W	WYW149234
84	CARR DRAW II ADD II ME JONES	14-32GW	SWSW	32	50N	75W	WYW149234
85	CARR DRAW II ADD II M MAYCOCK	12-33BG	SWNW	33	50N	75W	WYW146810

	Well Name	Well #	Qtr/Qtr	Sec	Twp	Rng	Lease #
86	CARR DRAW II ADD II M MAYCOCK	12-33GW	SWNW	33	50N	75W	WYW146810
87	CARR DRAW II ADD II M MAYCOCK	14-33BG	SWSW	33	50N	75W	WYW146810
88	CARR DRAW II ADD II M MAYCOCK	14-33GW	SWSW	33	50N	75W	WYW146810
89	CARR DRAW II ADD II M MAYCOCK	23-33BG	NESW	33	50N	75W	WYW146810
90	CARR DRAW II ADD II M MAYCOCK	23-33GW	NESW	33	50N	75W	WYW146810
91	CARR DRAW II ADD II M MAYCOCK	34-33BG	SWSE	33	50N	75W	WYW146810
92	CARR DRAW II ADD II M MAYCOCK	34-33GW	SWSE	33	50N	75W	WYW146810
93	CARR DRAW II ADD II M MAYCOCK	41-33BG	NENE	33	50N	75W	WYW146810
94	CARR DRAW II ADD II M MAYCOCK	41-33GW	NENE	33	50N	75W	WYW146810
95	CARR DRAW II ADD II M MAYCOCK	43-33BG	NESE	33	50N	75W	WYW146810
96	CARR DRAW II ADD II M MAYCOCK	43-33GW	NESE	33	50N	75W	WYW146810

* Indicates APD is for a monitoring well

And to approve 20 Produced Water Impoundments:

	IMPOUNDMENT NAME	Qtr/Qtr	SEC	TWP	RNG	LEASE #
1	41-3-4975	NENE	3	49N	75W	FEE
2	MAYCOCK 41-33-5075	NENE	33	50N	75W	WYW146810
3	MIDDLETON #2	SWSE	21	50N	75W	WYW154404
4	MIDDLETON #1	NENW	27	50N	75W	WYW146810
5	43-34-5075	NWSE	34	50N	75W	FEE
6	42-3-4975	SENE	3	49N	75W	FEE
7	13-2-4975	NWSW	2	49N	75W	FEE
8	44-3-4975	SESE	3	49N	75W	FEE
9	14-2-4975D	SWSW	2	49N	75W	WYW147302
10	14-2-4975A	SWSW	2	49N	75W	WYW147302
11	12-11-4975	SWNW	11	49N	75W	WYW147302
12	33-10-4975	NWSE	10	49N	75W	WYW147305
13	HANNAH	SENE	21	50N	75W	WYW154404
14	42-26-5075	SENE	26	50N	75W	FEE
15	34-26-5075	SWSE	26	50N	75W	WYW146810
16	NEW ORLEANS	SWSW	26	50N	75W	WYW128096
17	MARLEY	SENE	27	50N	75W	WYW146810
18	YELLOW HAT	NESW	27	50N	75W	WYW146810
19	FOGGY	SENE	27	50N	75W	WYW146810
20	JONES GULLEY	NESW	32	50N	75W	WYW149234

In addition to the listed APDs, it is my decision to approve the following right-of-way grants:

ROW Grant	Type	Sections	TWP/RNG
WYW-169689	Access road, water pipeline and buried power line	Section 4: NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 6: Lot 1, E $\frac{1}{2}$ E $\frac{1}{2}$; Section 9: E $\frac{1}{2}$ E $\frac{1}{2}$.	T. 49 N., R. 75 W.
WYW-169691	Gas pipeline.	Section 4: NE $\frac{1}{4}$ SE $\frac{1}{4}$; Section 6: Lot 1, E $\frac{1}{2}$ E $\frac{1}{2}$; Section 9: E $\frac{1}{2}$ E $\frac{1}{2}$.	T. 49 N., R. 75 W.

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.
 - Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
 - 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.
8. Based on current information, we determined that no significant impacts in the spread of WNV would occur from the implementation of this project.

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 Co.
Carr Draw II Additions II
PLAN OF DEVELOPMENT
WY-070-EA07-023**

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/or 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 one or more valid 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.

The purpose for the proposal is to quantify reserves and produce coal bed natural gas (CBNG) on one or more valid federal oil and gas mineral leases issued to the applicant by the BLM.

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

Description of the Proposed Action

Proposed Action Title/Type: Williams Production RMT Co.’s Carr Draw II Additions II Plan of Development (POD) for 96 coal bed natural gas well APD’s and associated infrastructure.

Proposed Well Information: There are 96 wells proposed within this POD, as follows:

	Well Name	Well #	Qtr/Qtr	Sec	Twp	Rng	Lease #
1	CARR DRAW II ADD II J MAYCOCK	32-2BG	SWNE	2	49N	75W	WYW147302
2	CARR DRAW II ADD II J MAYCOCK	32-2GW	SWNE	2	49N	75W	WYW147302
3	CARR DRAW II ADD II THRONE	23-3GW	NESW	3	50N	75W	WYW162026
4	CARR DRAW II ADD II THRONE	34-3GW	SWSE	3	50N	75W	WYW162026
5	CARR DRAW II ADD II THRONE	43-3GW	NESE	3	50N	75W	WYW162026
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9	CARR DRAW II ADD II M MAYCOCK	32-4GW	SWNE	4	49N	75W	WYW149966
10	CARR DRAW II ADD II M MAYCOCK	34-4BG	SWSE	4	49N	75W	WYW149966
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14	CARR DRAW II ADD II FEDERAL	12-5GW	SWNW	5	49N	75W	WYW149966
15	CARR DRAW II ADD II FEDERAL	12-5BG	SWNW	5	49N	75W	WYW149966
16	CARR DRAW II ADD II FEDERAL	21-5BG	NENW	5	49N	75W	WYW149966
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50	CARR DRAW II ADD II M MAYCOCK	12-27GW	SWNW	27	50N	75W	WYW125542
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58	CARR DRAW II ADD II M MAYCOCK	32-27BG	SWNE	27	50N	75W	WYW146810
59	CARR DRAW II ADD II M MAYCOCK	32-27GW	SWNE	27	50N	75W	WYW146810
60	CARR DRAW II ADD II M MAYCOCK	34-27BG	SWSE	27	50N	75W	WYW146810
61	CARR DRAW II ADD II M MAYCOCK	34-27GW	SWSE	27	50N	75W	WYW146810
62	CARR DRAW II ADD II M MAYCOCK	41-27BG	NENE	27	50N	75W	WYW146810
63	CARR DRAW II ADD II M MAYCOCK	41-27GW	NENE	27	50N	75W	WYW146810
64	CARR DRAW II ADD II M MAYCOCK	12-28BG	SWNW	28	50N	75W	WYW146810
65	CARR DRAW II ADD II M MAYCOCK	12-28GW	SWNW	28	50N	75W	WYW146810
66	CARR DRAW II ADD II M MAYCOCK	14-28BG	SWSW	28	50N	75W	WYW146810
67	CARR DRAW II ADD II M MAYCOCK	14-28GW	SWSW	28	50N	75W	WYW146810
68	CARR DRAW II ADD II M MAYCOCK	23-28BG	NESW	28	50N	75W	WYW146810
69	CARR DRAW II ADD II M MAYCOCK	23-28GW	NESW	28	50N	75W	WYW146810
70	CARR DRAW II ADD II M MAYCOCK	43-28BG	NESE	28	50N	75W	WYW146810
71	CARR DRAW II ADD II M MAYCOCK	43-28GW	NESE	28	50N	75W	WYW146810
72	CARR DRAW II ADD II M MAYCOCK	43-29BG	NESE	29	50N	75W	WYW125979
73	CARR DRAW II ADD II M MAYCOCK	43-29GW	NESE	29	50N	75W	WYW125979
74	CARR DRAW II ADD II CARU	32-29BG	SWNE	29	50N	75W	WYW129538
75	CARR DRAW II ADD II CARU	32-29GW	SWNE	29	50N	75W	WYW129538
76	* CARR DRAW II ADD II CARU	42-29 BG	SENE	29	50N	75W	WYW129538
77	* CARR DRAW II ADD II CARU	42-29 GW	SENE	29	50N	75W	WYW129538
78	* CARR DRAW II ADD II CARU	42-29 SW	SENE	29	50N	75W	WYW129538
79	CARR DRAW II ADD II M MAYCOCK	23-29BG	NESW	29	50N	75W	WYW157699
80	CARR DRAW II ADD II M MAYCOCK	23-29GW	NESW	29	50N	75W	WYW157699
81	CARR DRAW II ADD II CARU	43-31BG	NESE	31	50N	75W	WYW146812
82	CARR DRAW II ADD II CARU	43-31GW	NESE	31	50N	75W	WYW146812
83	CARR DRAW II ADD II ME JONES	14-32BG	SWSW	32	50N	75W	WYW149234
84	CARR DRAW II ADD II ME JONES	14-32GW	SWSW	32	50N	75W	WYW149234
85	CARR DRAW II ADD II M MAYCOCK	12-33BG	SWNW	33	50N	75W	WYW146810
86	CARR DRAW II ADD II M MAYCOCK	12-33GW	SWNW	33	50N	75W	WYW146810
87	CARR DRAW II ADD II M MAYCOCK	14-33BG	SWSW	33	50N	75W	WYW146810
88	CARR DRAW II ADD II M MAYCOCK	14-33GW	SWSW	33	50N	75W	WYW146810
89	CARR DRAW II ADD II M MAYCOCK	23-33BG	NESW	33	50N	75W	WYW146810
90	CARR DRAW II ADD II M MAYCOCK	23-33GW	NESW	33	50N	75W	WYW146810
91	CARR DRAW II ADD II M MAYCOCK	34-33BG	SWSE	33	50N	75W	WYW146810

	Well Name	Well #	Qtr/Qtr	Sec	Twp	Rng	Lease #
92	CARR DRAW II ADD II M MAYCOCK	34-33GW	SWSE	33	50N	75W	WYW146810
93	CARR DRAW II ADD II M MAYCOCK	41-33BG	NENE	33	50N	75W	WYW146810
94	CARR DRAW II ADD II M MAYCOCK	41-33GW	NENE	33	50N	75W	WYW146810
95	CARR DRAW II ADD II M MAYCOCK	43-33BG	NESE	33	50N	75W	WYW146810
96	CARR DRAW II ADD II M MAYCOCK	43-33GW	NESE	33	50N	75W	WYW146810

* Indicates APD is for a monitoring well

Produced Water Impoundments:

	IMPOUNDMENT NAME	Qtr/Qtr	SEC	TWP	RNG	LEASE #
1	41-3-4975	NENE	3	49N	75W	FEE
2	MAYCOCK 41-33-5075	NENE	33	50N	75W	WYW146810
3	MIDDLETON #2	SWSE	21	50N	75W	WYW154404
4	MIDDLETON #1	NENW	27	50N	75W	WYW146810
5	43-34-5075	NWSE	34	50N	75W	FEE
6	42-3-4975	SENE	3	49N	75W	FEE
7	13-2-4975	NWSW	2	49N	75W	FEE
8	44-3-4975	SESE	3	49N	75W	FEE
9	14-2-4975D	SWSW	2	49N	75W	WYW147302
10	14-2-4975A	SWSW	2	49N	75W	WYW147302
11	12-11-4975	SWNW	11	49N	75W	WYW147302
12	33-10-4975	NWSE	10	49N	75W	WYW147305
13	HANNAH	SENE	21	50N	75W	WYW154404
14	42-26-5075	SENE	26	50N	75W	FEE
15	34-26-5075	SWSE	26	50N	75W	WYW146810
16	NEW ORLEANS	SWSW	26	50N	75W	WYW128096
17	MARLEY	SENE	27	50N	75W	WYW146810
18	YELLOW HAT	NESW	27	50N	75W	WYW146810
19	FOGGY	SENE	27	50N	75W	WYW146810
20	JONES GULLEY	NESW	32	50N	75W	WYW149234

Rights of ways:

ROW Grant	Type	Sections	TWP/RNG
WYW-169689	Access road, water pipeline and buried power line	Section 4: NE¼SE¼; Section 6: Lot 1, E½E½; Section 9: E½E½.	T. 49 N., R. 75 W.
WYW-169691	Gas pipeline.	Section 4: NE¼SE¼; Section 6: Lot 1, E½E½; Section 9: E½E½.	T. 49 N., R. 75 W.

County: Campbell

Applicant: Williams Production RMT Co.

Surface Owners: Mary Ellen Jones, Joseph Maycock, Mitchell Maycock, Throne Ranch Company

The proposed action involves the development of the project, which includes the following:

- Drilling of 96 total federal CBNG wells in Werner, Gates/Wall and Big George coal zones to depths of approximately 1200 to 2200 feet.

- Development of 3 deep groundwater monitoring wells.
- An unimproved and improved road network.
- A Water Management Plan (WMP) that involves the following infrastructure and strategy: 20 discharge points and 20 infiltration stock water reservoirs within the Upper Powder River watershed.
- A buried gas, water and power line network, and will use existing central gathering/metering facilities and compression 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 Water Management Plan (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 MSRP, 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. Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
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

Modifications, or alternatives, to the original proposal received from the operator, were identified as the result of the pre-approval onsite inspections. The changes and mitigation measures to the proposed action resulting from the on-site will be analyzed in Alternative C.

Implementation of committed mitigation measures contained in the Master Surface Use Plan, Drilling Program, and Water Management Plan, in addition to the Standard COAs contained in the PRB FEIS Record of Decision Appendix A, are incorporated and analyzed in this alternative.

At the on-sites, all areas of proposed surface disturbance were inspected to ensure that potential impacts to natural resources would be minimized. 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 or minimize 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 or minimize environmental effects of the operator's proposal. The specific changes identified for the Carr Draw II Additions II POD are listed below under 2.3.1:

2.3.1. Changes as a result of the on-sites

Well #	Qtr/Qtr	Sec	TWP	RNG	Changes as a result of the on-sites
21-5	NENW	5	49N	75W	Williams provided an engineered diagram for the access road to the 21-5-4975.
23-11	NESW	11	49N	75W	A low water crossing was added on the access to the 23-11-4975.
23-4	NESW	4	49N	75W	Revised all pad diagrams to include an access road. The pad diagram for the 23-4-4975 was also revised so that the pit is located in the cut portion of the pad.
12-11	SWNW	11	49N	75W	Williams agreed to keep the pipeline to the 12-11-4975 to 25' in width through the sagebrush.
14-21	SWSW	21	50N	75W	Williams agreed to keep the pipeline to the 14-21-5075 to 25' in width through the sagebrush.
23-28	NESW	28	50N	75W	Williams moved the 23-28-5075 location approximately 350' southwest due to proximity to sagebrush habitat.
34-33	SWSE	33	50N	75W	Williams agreed to keep the pipeline to the 34-33-5075 to 25' in width through the sagebrush.
23-22	NESW	22	50N	75W	Williams did not feel they could keep the entire length of the access road down to 25' in width but agreed to minimize the disturbance width as much as possible to the 23-22-5075 due to sagebrush.
43-4	NESE	4	49N	75W	Williams agreed line pit due to proximity to drainage.
34-4	SWSE	4	49N	75W	Due to proximity to drainage, Williams will provide silt mitigation on fill side on the 34-4-4975.
14-33	SWSW	33	50N	75W	Due to sagebrush habitat, changed the access road to the 14-33-5075 to come in from the west.
14-27	SWSW	27	50N	75W	Williams agreed to line the pit due to topography. Williams changed the access road to the 14-27-5075, will re-stake approximately 75' south of the original proposal.
14-32	SWSW	32	50N	75W	Williams agreed to line the pit due to proximity drainage. Williams will utilize spot upgrades on the access road to the 14-32-5075.
21-14	NENW	14	49N	75W	The intersection to access the 21-14-4975 was modified from Y to a T to prevent the cutting of corners avoiding more surface disturbance.
43-21	NESE	21	50N	75W	Williams changed access to avoid sagebrush and lessen slope, will move pipeline for discharge point more due south, out of sage. Moved the 43-21-5075BG well ~ 30' southeast out of sagebrush
14-28	SWSW	28	50N	75W	Williams has proposed a constructed pad for the 14-28-5075 location but may reduce the size to a slotted pad during construction.
12-27	SWNW	27	50N	75W	Williams has proposed a constructed pad to the 12-27-5075 but may reduce the size to a slotted pad during construction. Will use silt mitigation in the drainage to the west.
23-3	NESW	3	50N	75W	Williams has proposed a constructed pad to the 23-3-5075 but may reduce the size to a slotted pad during construction. Williams will use silt mitigation in the drainage to the west.
34-3	SWSE	3	50N	75W	Williams located a new access road to the 34-03-5075 just west outside of heavy sagebrush to run near fence.
14-22	SWSW	22	50N	75W	Williams moved the 14-22-5075 location approximately 50' west to get it onto a flatter surface and minimize disturbance of leveling the drilling rig.
34-22	SWSE	22	50N	75W	Williams moved the 34-22-5075 location approximately 500 west out of sagebrush habitat. Changed the access to the 34-22-5075 to come in from the 23-22-5075 northwest location and revised the plan for just a pipeline to and from the 43-27-5075 location.
34-26	SWSE	26	50N	75W	Williams moved the access road to the 34-26-5075 approximately 80' to the east, out of sagebrush habitat.

Well #	Qtr/Qtr	Sec	TWP	RNG	Changes as a result of the on-sites
41-27	NENE	27	50N	75W	Williams revised the proposal; the access to the 41-27-5075 location will come from the southeast with pipeline to the northwest.
41-33	NENE	33	50N	75W	Williams said they could drill without a pad. They dropped the constructed pad and will use spoil pile to level the rig.
14-11	SWSW	11	49N	75W	Williams will change access road to minimize disturbance at corner.
32-2	SWNE	2	49N	75W	Williams will get information about another operator who has a 10 acre agreement with the landowner for a nearby compressor station.
12-28	SWNW	28	50N	75W	Williams will keep the pad layout diagram on file for the 12-28-5075 location but will try to drill without a pad using the spoil pile to level the rig.
43-27	NESE	27	50N	75W	Williams will reclaim the old access road near the 43-27-5075.
43-31	NESE	31	50N	75W	Williams will use disturbance of an existing 2-track to access the 43-31-5075. Williams will also label the proposed engineered section, to access the 43-31-5075, on the maps.
12-5	SWNW	5	49N	75W	Williams moved the pipeline to reduce disturbance and reduce length of buried power. Engineer looked at road, this road needed a template.

Water Management Plan Changes

Sec	TWP	RNG	Changes as a result of the on-sites
			Jones Dam was dropped prior to the onsite because operator found a sandstone layer during excavation.
32	50N	75W	Mary Ellen Dam was dropped because of poor location (steep sided gully with very large watershed).
2	49N	75W	14-2-4975B Dam was dropped due to small size. It was deemed to be unnecessary to meet water handling objectives.
32	50N	75W	Mitigation measures will be applied to the outlet of Jones Gully Dam to reduce the chance of gully movement from the main draw up to the dam's toe in the side draw.

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 for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. The BLM will require that operators comply with the latest DEQ standards and monitoring guidance.

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 be required to provide a reclamation bond for impoundments over federal minerals in the amount specified by a qualified Professional Engineer for the impoundments to be used for the management of CBNG water. The bond amount will be submitted within 90 days after POD approval and will be approved by the BLM prior to commencing construction.
5. The operator will supply a copy of the complete approved SW-4, SW-3, or SW-CBNG permits to BLM as they are issued by WSEO for impoundments.

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. Vegetation

1. Temporarily fence reseeded areas, if not already fenced, for at least two complete growing seasons to insure reclamation success on problematic sites (e.g. close to livestock watering source, erosive soils etc.).

2.3.2.5. 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.

2.3.2.6. Wildlife

1. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies will conduct clearance surveys for sage grouse breeding activity during the sage grouse's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 mile of the proposed activities.
2. The Companies will construct power lines to minimize the potential for raptor collisions with the lines. Potential modifications include burying the lines, avoiding areas of high avian use (for example, wetlands, prairie dog towns, and grouse leks), and increasing the visibility of the individual conductors.
3. The Companies will locate aboveground power lines, where practical, at least 0.5 mile from any sage

grouse breeding or nesting grounds to prevent raptor predation and sage grouse collision with the conductors. Power poles within 0.5 mile of any sage grouse breeding ground will be raptor-proofed to prevent raptors from perching on the poles.

4. 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.
5. The Companies will limit the construction of aboveground power lines near streams, water bodies, and wetlands to minimize the potential for waterfowl colliding with power lines.
6. 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.

2.3.2.7. Aquatics Species

1. In ponds developed where the primary objective is as a fishery, water quality will be sampled by the Companies on an annual basis for selenium, Total Dissolved Solids (TDS), salinity, temperature, pH, dissolved oxygen, and sodium bicarbonate.

2.3.2.8. Threatened, Endangered, or Sensitive Species

2.3.2.8.1. Bald Eagle

1. Additional mitigation measures may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to bald eagles or their habitat.

2.3.2.8.2. Black-footed Ferret

1. Prairie dog colonies will be avoided wherever possible.
2. If any black-footed ferrets are located, the USFWS will be consulted. Absolutely no disturbance will be allowed within prairie dog colonies inhabited by black-footed ferrets.
3. Additional mitigation measure may be necessary if the site-specific project is determined by a BLM biologist to have adverse effects to black-footed ferrets or their habitat. In the event that a mountain plover is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.

2.3.2.8.3. Mountain Plover

1. In the event that a mountain plover is located during construction or operation, the USFWS' Wyoming Field Office (307-772-2374) and the USFWS' Law Enforcement Office (307-261-6365) will be notified within 24 hours.
2. A mountain plover nesting survey shall be conducted following U.S. Fish and Wildlife Service protocol within occupied black-tailed prairie dog colonies prior to permit authorization.
3. Outside of occupied black-tailed prairie dog colonies, a mountain plover nesting survey following U.S. Fish and Wildlife Service protocol is encouraged prior to construction initiation, as project modifications can be made if necessary to protect nesting plovers and natural gas production. If requested in writing, then authorization may be granted for construction activities to occur between August 1 and March 15, outside the mountain plover breeding season. A mountain plover nesting survey following U.S. Fish and Wildlife Service protocol shall be conducted during the first available survey period (May 1 – June 15). Additional measures such as monitoring and activity restrictions may be applied if mountain plovers are documented.
4. A disturbance-free buffer zone of 0.25 mile will be established around all occupied mountain plover nesting habitat between March 15 and July 31.
5. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.
6. Creation of hunting perches or nest sites for avian predators within 0.5 mile of identified nesting areas will be avoided by burying power lines, using the lowest possible structures for fences and other

structures and by incorporating perch-inhibiting devices into their design.

7. When above ground markers are used on capped and abandoned wells they will be identified with markers no taller than four feet with perch inhibiting devices on the top to avoid creation of raptor hunting perches within 0.5 mile of nesting areas.
8. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.

2.3.2.9. Visual Resources

1. The Companies will mount lights at compressor stations 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.

2.3.2.10. 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.

2.3.2.11. 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 from the BLM authorized officer.

2.3.3. Site specific mitigation measures

1. All changes made at the onsite will be followed. They have all been incorporated into the operator's POD.
2. The pipeline corridors to the 12-11-4975, 14-21-5075, 23-28-5075, 23-22-5075 and the 34-33-5075 well locations will be limited to 25 feet in width to reduce surface disturbance through sagebrush. Exceptions may be necessitated by subsurface rock and/or where safety is an issue.
3. Due to the proximity of drainage, Williams will provide silt mitigation on the fill side on the 34-4-4975 location.
4. With the surface owner concurrence, Williams will reclaim the old access road near the 43-27-5075 location.
5. Pits will be lined at the following locations in addition to any other location where permeable material and or free water is encountered as a result of excavation:
 - Well 14-27
 - Well 43-4
 - Well 14-32
6. All permanent above-ground structures (e.g., production equipment, tanks, etc.) not subject to safety requirements will be painted to blend with the natural color of the landscape. The paint used will be a color which simulates "Standard Environmental Colors." The color selected for the Carr Draw II Addition II POD is Carlsbad Canyon, 2.5Y 6/2.

7. The 3 monitor wells (located in SENE, Section 29, T50N, R75W) associated with the Carr Draw II Additions II POD will be drilled and completed 30 days prior to initiating pumping of production wells in the Carr Draw II Additions II POD. Please see monitor well drilling guidelines (Section F) in the associated Conditions of Approval.
8. The approval of this project does not grant authority to use off lease federal lands. No surface disturbing activity, or use of off-lease federal lands, is allowed on affected leases until right-of-way grants become effective on the date in which the right-of-way grant is signed by the authorized officer of the BLM.
9. This POD approval includes the application of an Integrated Pest Management Plan that includes an annual weed control program. The operator must submit a Pesticide Use Proposal (PUP) to the BLM Authorized Officer prior to the application of pesticides on federal lands.
10. 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 mix desired by the surface owner, use the following:

Loamy Seed Mix (All Locations)

Species	% in Mix	Lbs PLS*
<i>Western Wheatgrass</i> (Pascopyrum smithii)/or <i>Thickspike Wheatgrass</i> (Elymus lanceolatus ssp. lanceolatus)	30	3.6
<i>Bluebunch Wheatgrass</i> (Pseudoroegneria spicata ssp. Spicata)	10	1.2
<i>Green needlegrass</i> (Nassella viridula)	25	3.0
<i>Slender Wheatgrass</i> (Elymus trachycaulus ssp. trachycaulus)	20	2.4
<i>Prairie coneflower</i> (Ratibida columnifera)	5	0.6
<i>White or purple prairie clover</i> (Dalea candidum, purpureum)	5	0.6
<i>Rocky Mountain beeplant</i> (Cleome serrulata) /or <i>American vetch</i> (Vicia americana)	5	0.6
Totals	100%	12 lbs/acre

*Varieties planted will be suitable/adaptable to the Powder River Basin

11. The operator will follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231) specifically the following:
Reclamation Standards:
 - C. 3 The reclaimed area shall be stable and exhibit none of the following characteristics:
 - a. Large rills or gullies.
 - b. Perceptible soil movement or head cutting in drainages.
 - c. Slope instability on, or adjacent to, the reclaimed area in question.
 - C.4. The soil surface must be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt. Additional short-term measures, such as the application of mulch, shall be used to reduce surface soil movement.
 - C.5. Vegetation canopy cover (on unforested sites), production and species diversity (including shrubs) shall approximate the surrounding undisturbed area. The vegetation

shall stabilize the site and support the planned post disturbance land use, provide for natural plant community succession and development, and be capable of renewing itself. This shall be demonstrated by:

- a. Successful onsite establishment of species included in the planting mixture or other desirable species.
 - b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
- C.6. The reclaimed landscape shall have characteristics that approximate the visual quality of the adjacent area with regard to location, scale, shape, color and orientation of major landscape features and meet the needs of the planned post disturbance land use.

Roads

- 1. Verify that all sight distances (both horizontal and vertical) on higher use roads meet BLM standards.
- 2. The culvert locations will be staked prior to construction. The culvert invert grade and finished road grade will be clearly indicated on the stakes. Culverts will be installed on natural ground, or on a designed flow line of a ditch. The minimum cover over culverts will be 12” or one-half the diameter whichever is greater. Drainage laterals in the form of culverts or waterbars shall be placed according to the following spacing:

<u>Grade</u>	<u>Drainage Spacing</u>
2-4%	310 ft
5-8%	260 ft
9-12%	200 ft
- 3. The operator is responsible for having the licensed professional engineer(s) certify that the actual construction of the road meets the design criteria and is constructed to Bureau standards.
- 4. Provide 4” of aggregate where grades exceed 8%.

Wildlife

- 1. If any dead or injured sensitive species is located during construction or operation, the BLM Buffalo Field Office (307-684-1100) shall be notified within 24 hours.
- 2. The Record of Decision for the Powder River Basin EIS includes a programmatic mitigation measure that states, “The companies will conduct clearance surveys for threatened and endangered or other special-concern species at the optimum time” (M32). The measure requires companies to coordinate with the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters. If the project is not completed by November 1st of the following year, Williams Production will coordinate with the BLM (Buffalo Field Office) to determine if the following surveys will be required:
 - a. Raptor nesting survey.
 - b. Sage grouse and sharp-tailed grouse survey.
 - c. Mountain Plover survey.

* The contract biologist shall contact the BLM prior to initiating any wildlife surveys.
- 3. No project related activities are permitted in suitable mountain plover habitat from March 15-July 31, unless a mountain plover nesting survey has been conducted during the current breeding season. A mountain plover survey will be required prior to any project related activities. The surveys will be conducted in suitable habitat (i.e. prairie dog colonies, roads, pipelines, reservoirs under construction or recently constructed and any short grass prairie areas) throughout the “**Entire**” project area. The prairie dog colonies are listed below:

Prairie Dog Colony Locations and Sizes

Location	Acres	Location to Project Area
T49N, R75W, NW ¼ Sec 2	164	Occurs within the project area.

Location	Acres	Location to Project Area
T50N, R75W, NESE of Sec 33 and the SW ¼ Sec 34	76	Occurs within the project area.
T50N, R75W, NENE Sec 32	7	Occurs within the project area.
T50N, R75W, NWNE Sec28	31	Occurs within the project boundary.
T50N, R75W, NESW Sec21	22	Occurs within and adjacent to the project area.
T49N, R75W, SESW Sec 10	5	Occurs within and adjacent to the project area.
T49N, R75W, NESW Sec 9	7	Occurs adjacent to the project area.
T50N, R75W, NESW Sec 21	2	Occurs within the project area.
T50N, R75W, SWNE Sec 26	35	Occurs within the project area.
T50N, R75W, SESE Sec 22	3	Occurs within the project area.
T50N, R75W, NESW Sec 29	3	Occurs within the project area.
T50N, R75W, NWNW Sec 29	3	Occurs within and adjacent to the project area.
T50N, R75W, SWNE Sec 29	4	Occurs within the project area.
T49N, R75W, NWSW Sec 3	30	Occurs within the project area.
T50N, R75W, SW Sec 23	41	Occurs just outside of the project area.
T49N, R75W, SESW Sec 3	30	Occurs within the project area.

- a. Mountain plover nesting surveys shall be conducted by a biologist following the most current U.S. Fish and Wildlife Service Mountain Plover Survey Guidelines (the survey period is May 1-June 15). All survey results must be submitted in writing to the BFO and approved prior to initiation of gas development related activities (i.e. drilling, road/pipeline construction and overhead powerline construction, etc.).
 - b. If a mountain plover is identified, then a seasonal disturbance-free buffer of 0.25 mile shall be maintained between March 15 and July 31. If no mountain plovers are identified, then surface disturbing activities may be permitted within suitable habitat until the following breeding season (March 15).
4. No project related activity shall occur within 0.5 mile of all identified raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. **This condition will be implemented on an annual basis for the duration of surface disturbing activities.** This timing limitation will affect the following proposed wells and their associated infrastructure:

Township/Range	Section	Affected Wells and Infrastructure
T50N,R75W	29	All project related activities in the section.
T50N,R75W	28	All project related activities in the section.
T50N,R75W	27	12-27, 12-27/11-27, 14-27 and all project related activities in the section.
T50N,R75W	33	41-33, 12-33 and all project related activities in the section..
T50N,R75W	31	43-31 and All project related activities in the section..
T49N,R75W	2	The two proposed water lines and 2 discharge points in the southwest portion of the section.
T49N,R75W	3	One waterline in the southeast portion of Section 3
T49N,R75W	4	32-4, 23-4, 34-4, 43-4, and all project related activities in the section.
T49N,R75W	5	12-5 and its associated infrastructure.
T49N,R75W	6	Resource road/pipeline in the eastern portion of Sec 6.
T49N,R75W	10	Proposed water, gas, electric lines in the southern portion and

Township/Range	Section	Affected Wells and Infrastructure
		the water line in the southeast quarter.
T49N,R75W	11	14-11 and its associated infrastructure.

- a. 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 and approved prior to surface disturbing activities. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a 0.5 mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within 0.5 mile of occupied raptor nests from February 1 to July 31.
- b. Nest 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 or 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. Nests to be checked are within a 0.5 mile or less of the proposed development. The nests are listed below:

BLM ID #	UTM N	UTM E	Legal
3435	4897684	431271	T49N,R75W SWSE Sec 10
No BLM#	4900554	430983	T50N,R75W NENW Sec 3

- c. If an undocumented raptor nest is located during project construction or operation, the Buffalo Field Office (307-684-1100) shall be notified within 24 hours.
5. Well metering, maintenance and other site visits within 0.5 miles of raptor nests shall be minimized as much as possible during the breeding season (February 1 – July 31), and restricted to between 0900 and 1500 hours.
6. The following conditions will minimize the impacts to sage grouse:
 - a. No project related activities are permitted within 2 miles of the following leks between March 1 and June 15, prior to completion of a greater sage-grouse lek survey: Hayden I, Hayden Sat A, Hayden Sat B, Watsabaugh I, Watsabaugh II, Watsabaugh III, Watsabaugh IV, Watsabaugh IV Site A, Watsabaugh IV Site B
***This timing limitation will affect the “Entire” Carr Draw II Additions II project area.**
 - b. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and disturbing activities will not be permitted until after the nesting season. If surveys indicate that the identified leks are inactive during the current breeding season, surface disturbing activities may be permitted within the 2 mile buffer until the following breeding season (March 1). 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 approved prior to surface disturbing activities.
 - 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.
7. Power lines will be buried whenever possible in the project area to protect bald eagles and other important wildlife. When it is not possible to bury them, overhead power lines will be constructed to standards identified by the Avian Power Line Interaction Committee and the additional measures outlined in the PRBEIS to minimize raptor electrocution potential (T&C 6).
8. All other conservation measures and terms and conditions identified in the Powder River Basin Oil and Gas Project Biological Opinion (WY6633) shall be complied with.

2.4. Alternatives considered but not analyzed in detail

There were no alternative water management strategies considered and documented in the water management plan submitted by the operator.

3. DESCRIPTION OF AFFECTED ENVIRONMENT

Applications to drill were received on **April 8, 2006**. Field inspections of the proposed **Carr Draw II Additions II** CBNG project were conducted on September 5, 6, and 14, 2006 by:

Randee Jespersen, Land Manager, Williams Production RMT
 Duane Joslyn, Operation Supervisor, Williams Production RMT
 Rex Lynde, Drilling, Williams Production RMT
 Ralph Demel, Construction Forman, Western Land Services
 Patrick Bancor, Project Manager, Western Land Services
 Peggy Carter, Hydrologist, Williams Production RMT
 Alen Jones, Hydrologist, Western Land Services
 Allen Aksamit, Wildlife Biologist, Western Land Services
 Joe Maycock, Surface Owner
 Todd Merchen, Lowhan Engineering
 Al Sprague, Civil Engineer, BLM
 Ben Adams, Hydrologist, BLM
 Guymen Easdale, Wildlife Biologist, BLM
 Jennifer Spegon, Natural Resource Specialist, BLM
 Denise Oliverius, Legal Instruments Examiner, 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			Guymen Easdale
Floodplains			X	Ben Adams
Wilderness Values		X		Jennifer Spegon
ACECs			X	Jennifer Spegon
Water Resources	X			Ben Adams
Air Quality		X		Jennifer Spegon
Cultural or Historical Values		X		G.L. "Buck" Damone III
Prime or Unique Farmlands			X	Jennifer Spegon
Wild & Scenic Rivers			X	Jennifer Spegon
Wetland/Riparian	X			Ben Adams
Native American Religious Concerns			X	G.L. "Buck" Damone III
Hazardous Wastes or Solids		X		Jennifer Spegon
Invasive, Nonnative Species	X			Jennifer Spegon
Environmental Justice			X	Jennifer Spegon

3.1. Topographic Characteristics of Project Area

The Carr Draw Federal POD II Additions II is located approximately 20 miles west of Gillette, Wyoming in Campbell County. The project area is located in Township 50 North, Range 75 West, Sections 3, 21-23, 26-29, 31-35 and Township 49 North, Range 75 West, Sections 2-5, 10, 11 and 14. The project area is approximately 90% private surface and 10% federal surface overlaying approximately 85% federal minerals and 15% private minerals. Current land uses within the project area include cattle grazing and coalbed natural gas development.

The topography within and around the project area consists of 15% rugged terrain with numerous ridges, deep draws and rough breaks. The remaining 85% consists of rolling hills cut by numerous steep to moderately steep draws. The elevation within the project area ranges from 4400 feet to 4800 feet above sea level. The project area is primarily within the Barber Creek drainage, a tributary to the Upper Powder River. A small portion of the project area drains to Kingsbury Creek, a tributary to Wild Horse Creek, which eventually flows into the Powder River as well. Both Kingsbury Creek and Wild Horse Creek drainages are ephemeral (flowing only in response to a precipitation event or snow melt). Land cover within the Carr Draw II Addition II POD consists of sagebrush shrubland and mixed-grass prairie.

3.2. Soils & Vegetation

Ecological Site Descriptions are used to provide soils and vegetation information needed for resource identification and management recommendations. To determine the appropriate Ecological Sites for this proposed action, BLM specialists analyzed data from onsite field reconnaissance and Natural Resources Conservation Service (NRCS) published soil survey soils information.

Soil

The NRCS, USDA, Technical Guides for the Major Land Resource Area 58B Northern Rolling High Plains, in the 10-14" Northern Plains precipitation zone, was used to identify the precipitation zone and used to analyze soils and vegetation for this project. The Loamy soils of this area are deep to moderately deep (greater than 20" to bedrock), well drained, and moderately permeable. Layers of the soil most influential to the plant community vary from 3 to 6 inches thick. These layers consist of the A horizon with very fine sandy loam, loam, or silt loam texture and may also include the upper few inches of the B horizon with sandy clay loam, silty clay loam or clay loam texture. The main soil limitations include low organic matter content and soil droughtiness. The low annual precipitation should be considered when planning a seeding. Due to the location of disturbances along less inclined slopes and the existing vegetative cover there will be a fair potential for reclamation success throughout the project area.

Map symbols and soil series names found in this project area include: 117 - Cambria/ Kishona/ Zigweid; 123 - Cushman/ Renohill; 124 - Cushman/ Shingle; 127 - Cushman/ Theedle; 147 - Forkwood. For more detailed soil information, see the NRCS Soil Survey WY605.

Plant Community

The Ecological Site classification for the loamy soil in this area is termed a Loamy Mixed Sagebrush/Grass Plant Community by the NRCS. Field observations verified these two vegetation types as sagebrush grassland and mixed grass prairie. The primary habitat, sagebrush grassland, is dominated by big sagebrush (*Artemisia tridentata wyomingensis*). The sagebrush community is the primary vegetation type, making up nearly 80% of the existing vegetation habitat. This vegetation type includes a combination of sparse (0-5 %), low (5-10 %), moderate (10-15 %) and dense (15-25 %) crown cover with a variety of understory grasses and forbs. Common species associated with this vegetation type include Wyoming big sagebrush, silver sagebrush (*Artemisia cana*), western wheat grass (*Pascopyrum smithii*), junegrass (*Koeleria macrantha*), needle and thread grass (*Hesperostipa comata*), Sandberg bluegrass (*Poa secunda*), prickly pear cactus (*Opuntia* spp.), scarlet globemallow (*Sphaeralcea coccinea*), and rabbit

brush (*Chrysothamnus* spp.) (Aksamit 2006).

Mixed-grass prairie is the second most common vegetation type, making up nearly 20% of the vegetation habitat. Common species of this vegetation type include needle and thread grass, western wheat grass, gramma (*Bouteloua* spp.), prickly pear cactus and scarlet globemallow. The common shrub of this vegetation type is Wyoming big sagebrush (Aksamit 2006).

Historically, Mixed Sagebrush/Grass Plant communities evolved under grazing by bison and a low fire frequency. Currently, this plant community is found under moderate, season-long grazing by livestock in the absence of fire or brush management. Wyoming big sagebrush is a significant component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grasses, and miscellaneous forbs. Dominant grasses include needle and thread, western wheatgrass, and green needlegrass. Grasses of secondary importance include blue grama, prairie junegrass, and Sandberg bluegrass. Forbs commonly found in this plant community include plains wallflower, hairy goldaster, slimflower scurfpea, and scarlet globemallow. Sagebrush canopy ranges from 20% to 30%. Fringed sagewort is commonly found. Plains pricklypear can also occur.

Stands of juniper were also identified throughout the project area and the surrounding area. Juniper stands were noted primarily on the sides and bottoms of the numerous draws within and around the project area. Juniper stands are characterized as being moderately dense to dense. Scattered juniper trees also occurred within sagebrush communities on ridge lines and flats throughout the project area and surrounding area (Aksamit 2006).

3.2.1. Wetlands/Riparian

Wetlands were observed in the vicinity of the 42-26 dam and the 44-3 dam. These two dams are old existing structures which have held water for some time, creating wetlands often associated with such impoundments. The wetland areas are not extensive, covering less than 2 acres total, and exist only because of the water wells and dams. There are no mature cottonwood forests or galleries within the project area. Occasional cottonwood trees, and sometimes small groves, are found throughout the riparian areas where moisture was adequate for establishment at one time or where they have been planted.

3.2.2. Invasive Species

Spotted knapweed was discovered by a search of inventory maps and databases. This infestation appears to occur along I-90, approximately one mile south of the Carr Draw II Addition II project area. There were no individual spotted knapweed or other state-listed noxious weeds discovered during the onsite or were there any listed by the proposed project proponent.

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 BLM biologist conducted field visits on September 5, 6, and 14, 2006. 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. A Biological Assessment was prepared by a BLM biologist. The Biological Assessment was submitted to the U.S. Fish and Wildlife Service (USFWS) for consultation.

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 occurring within the Carr Draw II Additions II project area include pronghorn antelope, mule deer and elk.

During the onsite September 6, 2006, a BLM biologist observed five elk (1 male, 2 females and 2 yearlings) in the draw near well 43-28. Elk sign was found in many locations throughout the project area. While conducting an onsite for another project (Yates-Lottery POD) just north of the Carr Draw II Additions II on November 8, 2006, a BLM biologist observed seven elk on the ridges just north of the Carr Draw II Additions II near the Kinney Divide. The elk were far away and moving fast down into the drainage. The BLM biologist was unable to determine sex and age class. While the BLM biologist was conducting the onsite for the Lottery POD, elk sign was found throughout the area. Based on the amount of elk sign present, elk appear to be using the area regularly. The Carr Draw II Additions II project area is 5.5 miles southeast of critical winter range, 3.5 miles southeast from parturition range, and 2.0 miles east of yearlong range for elk. These designated ranges are located in and around the Fortification Creek Special Management Areas. Representatives of both Williams and Yates and local land owners reported seeing elk in the area on a regular basis. The estimated population for the Fortification Creek elk herd (which covers hunt area 2) is 165 animals for 2004, Wyoming Game Fish Department objectives for this herd is 150 animals (WGFD 2003).

The northern half of the project area is designated yearlong range and the southern half of the project area is winter yearlong range for pronghorn antelope. The estimated population for the Gillette antelope herd (which covers hunt area 17) is 13,985 animals for 2004, Wyoming Game Fish Department objectives for this herd is 11,000 animals (WGFD 2003).

The entire project area is designated yearlong range for mule deer. The estimated population for the Powder River mule deer herd (which covers hunt area 17) is 55,561 animals for 2004, Wyoming Game Fish Department objectives for this herd is 52,000 animals ((WGFD 2003).

Crucial Range is any particular seasonal range or habitat component, but describes that component which has been documented as the determining factor in a population's ability to maintain and reproduce itself at a certain level. **Winter** use is when a population or portion of a population of animals uses the documented suitable habitat sites within this range annually, in substantial numbers only during the winter period. **Parturition Areas** are documented birthing areas commonly used by females. It includes calving areas, fawning areas, and lambing grounds. These areas may be used as nurseries by some big game species.

Winter-Yearlong use is when a population or a portion of a population of animals makes general use of the documented suitable habitat sites within this range on a year-round basis. During the winter months there is a significant influx of additional animals into the area from other seasonal ranges. **Yearlong** use is when a population of animals makes general use of suitable documented habitat sites within the range on a year round basis. Animals may leave the area under severe conditions. Big game range maps are available in the PRB FEIS (3-119-143), the project file, and from the WGFD.

3.3.2. Aquatics

The project area is drained by ephemeral tributaries of Barber Creek, Fortification Creek and Kingsbury Creek. Barber and Fortification creeks are both direct tributaries to the Upper Powder River. Kingsbury Creek is an ephemeral tributary to Wild Horse Creek, which is a tributary to the Upper Powder River. No natural springs were identified within one mile of the POD boundary. The water management plan for this project proposes full containment of water in impoundments, which implies that no water should reach the Powder River.

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).

3.3.4. Raptors

Raptor species expected to occur in suitable habitats within the project area include northern harrier, golden eagle, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, prairie falcon, short-eared owl, great horned owl, osprey, bald eagle, rough-legged hawk, Merlin and burrowing owls. Raptors species identified by the environmental consultant, Western Land Services, within the project area include snowy owl, golden eagle, red-tailed hawk, northern harrier, rough-legged hawk and great-horned owl.

Most raptor species nest in a variety of habitats including but not limited to; native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, sagebrush and tree cavities (PRB FEIS 3-145-148).

According to the BLM Buffalo Field Office database and the 2006 raptor survey conducted by Western Land Services there are eighteen raptor nests that occur within or adjacent to the project area. Based on the 2006 raptor survey, there were two active raptor nests, eleven inactive, and five nests of unknown status.

Table 3.2. Summary of active Raptor Nests: Location and Nest Condition (The nests are numbered as per BLM Buffalo Field Office). Information in the table is based on the 2006 raptor survey and BLM database.

BLM ID #s	Species	Substrate	Activity	Nest condition	UTM N	UTM E	Legal Quarter, Section, Township, Range,	Distance from Facilities/Roads
2892	UNK	BEL	Inactive	Good	4903385	429870	T50N,R75W SENE Sec28	Nest is approximately 0.25 miles from wells 12-27 and 43-28.
2893	UNK	CTL	Inactive	Remnant	4903036	429772	T50N,R75W NESE Sec28	Nest is 520 ft. from well 43-28. Nest is practically gone.
2894	RTHA	CTL	Inactive	Good	4903000	429716	T50N,R75W NWSE Sec 28	Nest is 760 ft from well 43-28. Did not have nest data at the onsite.
2895	RTHA	CTL	Unknown	Could not locate	4902427	428964	T50N,R75W NWNW Sec 33	Well 14-28 is 1220 ft. from the nest.
4123	COHA	JUN	Inactive	Good	4903095	428931	T50N,R75W NWSW Sec 28	Well 23-28 was moved 350 ft. southwest, the new location puts the well approximately 420 ft. away.
No BLM #	COHA	JUN	Inactive	Fair	4902688	427822	T50N,R75W SWSE Sec29	Nest is 0.35 miles from Fed well 23-29 and 556 ft. from Proposed Fee well.
1394	RTHA	CTL	Inactive	Good	4902175	427221	T50N,R75W NWNW Sec 32	Nest is 0.3 miles from existing crown and ditch road and 0.3 miles from an existing well.
3731	RTHA	CTL	Unknown	Good	4901768	426314	T50N,R75W SWNE Sec31	Nest is 0.5 miles from an existing well.
No BLM #	UNK	GND	Inactive	Remnant	4902283	425819	T50N,R75W NWNW Sec 31	No wells or infrastructure within 0.5 miles of the nest.
3435	RTHA	CTL	Active	Good	4897684	431271	T49N,R75W SWSE Sec 10	Nest is 0.1 miles from a proposed water line and 0.08 miles from an existing

BLM ID #s	Species	Substrate	Activity	Nest condition	UTM N	UTM E	Legal Quarter, Section, Township, Range,	Distance from Facilities/Roads
								primitive road.
No BLM #	UNK	CTL	Inactive	Fair	4900517	430837	T49N,R75W NENE Sec 3	Nest is 750 ft. from an existing well, the nest is in a draw and out of sight of existing well.
4122	RTHA	CTL	Inactive	Good	4902758	429063	T50N,R75W SWSW Sec 28	Nest is approximately 825 ft. from the nest, well is across the drainage and may be in line of sight.
3546	UNK	CLF	Inactive	Remnant	4899584	427407	T50N,R75W NWSE Sec 5	Nest is 0.22 miles from proposed FED well 23-28, nest is down in a draw and out of line of sight of the well. Nest is 0.24 miles from FED well 14-28, nest is in a draw and out of line of sight.
3545	RTHA	CLF	Unknown	Could not locate	4899732	429640	T50N,R75W NWSW Sec 4	Nest is 0.04 miles from proposed utility corridor; 0.24 miles from FED well 32-4; 0.20 miles from FED well 43-4 0.17 miles from FED well 34-4; and 0.31 miles from FED well 23-4. Nest is in a deep drainage and is out of sight of all wells.
3434	GHOW	CTL	Unknown	Could not locate	4899260	431270	T49N,R75W NENE Sec 10	Nest is 0.15 miles from an existing well and 0.22 miles from another existing well and 0.04 miles from a proposed utility line. Both wells are out of line of sight of the nest.
No	GHOW	CLF	Active	Good	4900554	430983	T50N,R75W NENE	Nest is 0.16 miles from an

BLM ID #s	Species	Substrate	Activity	Nest condition	UTM N	UTM E	Legal Quarter, Section, Township, Range,	Distance from Facilities/Roads
BLM #							Sec 3	existing well and 0.36 miles from another existing well. Nest is in a deep drainage and both wells are out of line of sight of the nest.
3547	RTHA	CTL	Inactive	Fair	4898574	427702	T49N,R75W SWNW Sec 8	Nest is 0.22 miles from existing primitive road. Nest is in a deep drainage and is out of line of sight of road.
No BLM #	UNK	No information	No information		4902680	427821	T50N,R75W NESW Sec 29	23-29 is approximately 0.3 miles from the nest. Proposed Fee well is 450 from the nest, it appears to be out of sight of the nest .

RTHA = red-tailed hawk
AMKE = American kestrel
CLFF = cliff
PD = prairie dog colony

FEHA = ferruginous hawk
GRHO = great-horned owl
CTL = cotton wood tree live
BUOW = burrowing owl

GOEA = golden eagle

UNKN= unknown

CTD = cottonwood tree dead

BEL=Box elder live

JUNP = juniper

PPD = ponderosa pine dead

GHS = ground/hillside

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 three 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).

Site Specific Habitat Conditions

The Carr Draw II Additions II project area is located 22 miles south of the Arvada potential reintroduction site.

Within 12 miles of the Carr Draw II Additions II project area there are 50 active prairie dog colonies and within 5 miles of the project area there are 33 active prairie dog colonies. The project area is surrounded by active prairie dog colonies. The total acreage for the 33 colonies that occur within 5 miles of the project area, but not including the project area, is 685 acres. The average distance between colonies is 1.25 miles.

Within the project area there are sixteen active prairie dog colonies. The colonies range in size from 2 to 164 acres, total acreage equals 463 acres. The project area has a high concentration of active prairie dog colonies. The average distance between colonies is 0.55 mile.

The total acreage of active prairie dog colonies that occur within the project area combined with colonies five miles of the project area is 1,148 acres. The “greater” project area has the potential to support black-footed ferrets.

Prairie Dog Colony Locations and Sizes within and adjacent to the Carr Draw II Additions II Project Area

Legal Location Township, Range and Section	Size Acres	Location to Project Area
T49N, R75W, NW ¼ Sec 2	164	Occurs within the project area.
T50N, R75W, NESE of Sec 33 and the SW ¼ Sec 34	76	Occurs within the project area.
T50N, R75W, NENE Sec 32	7	Occurs within the project area.
T50N, R75W, NWNE Sec28	31	Occurs within the project boundary.
T50N, R75W, NESW Sec21	22	Occurs within and adjacent to the project area.

Legal Location Township, Range and Section	Size Acres	Location to Project Area
T49N, R75W, SESW Sec 10	5	Occurs within and adjacent to the project area.
T49N, R75W, NESW Sec 9	7	Occurs adjacent to the project area.
T50N, R75W, NESW Sec 21	2	Occurs within the project area.
T50N, R75W, SWNE Sec 26	35	Occurs within the project area.
T50N, R75W, SESE Sec 22	3	Occurs within the project area.
T50N, R75W, NESW Sec 29	3	Occurs within the project area.
T50N, R75W, NWNW Sec 29	3	Occurs within and adjacent to the project area.
T50N, R75W, SWNE Sec 29	4	Occurs within the project area.
T49N, R75W, NWSW Sec 3	30	Occurs within the project area.
T50N, R75W, SW Sec 23	41	Occurs just outside of the project area.
T49N, R75W, SESW Sec 3	30	Occurs within the project area.

3.3.5.1.2. Bald eagle

On February 14, 1978, the bald eagle was federally listed as Endangered in all of the continental United States except for Minnesota, Wisconsin, Michigan, Oregon, and Washington. In these states the bald eagle was listed as Threatened. On July 12, 1995 the eagle's status was changed to Threatened throughout the United States. Species-wide populations are recovering from earlier declines, and the bald eagle was proposed for de-listing in 2000, but as yet no final decision has been made.

Bald eagle nesting habitat is generally found along lakes, rivers, and other 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 area is located in the upper portion of the Barber Creek drainage where there is an overall lack of trees to provide nesting or winter roosting habitat for bald eagles. However, bald eagles may be seen using the area for foraging due to high prairie dog densities and numerous reservoirs within and adjacent to the project area which may attract waterfowl.

A good and reliable prey base exists within and adjacent to the project area. The prey consists of prairie dogs and potentially waterfowl. There are numerous active prairie dog colonies scattered throughout the project area. According to the BLM (Buffalo Field Office) database and the 2005 and 2006 wildlife report (Aksamit 2006) there are 16 active prairie dog colonies within the project area and total 463 acres.

3.3.5.1.3. 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.

Site Specific Habitat Conditions

According to the 2006 habitat survey no Ute Ladies’-tresses Orchid habitat exists within the project area.

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. 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.

Within the project area there are sixteen prairie dog colonies. The colonies range in size from 2 to 164 acres, total acreage equals 463 acres. The area has a high concentration of active prairie dog colonies.

Prairie Dog Colony Locations and Sizes

Legal Location Township, Range and Section	Size Acres	Location to Project Area
T49N, R75W, NW ¼ Sec 2	164	Occurs within the project area.
T50N, R75W, NESE of Sec 33 and the SW ¼ Sec 34	76	Occurs within the project area.
T50N, R75W, NENE Sec 32	7	Occurs within the project area.
T50N, R75W, NWNE Sec28	31	Occurs within the project boundary.
T50N, R75W, NESW Sec21	22	Occurs within and adjacent to the project area.
T49N, R75W, SESW Sec 10	5	Occurs within and adjacent to the project area.
T49N, R75W, NESW Sec 9	7	Occurs adjacent to the project area.
T50N, R75W, NESW Sec 21	2	Occurs within the project area.
T50N, R75W, SWNE Sec 26	35	Occurs within the project area.
T50N, R75W, SESE Sec 22	3	Occurs within the project area.
T50N, R75W, NESW Sec 29	3	Occurs within the project area.
T50N, R75W, NWNW Sec 29	3	Occurs within and adjacent to the project area.
T50N, R75W, SWNE Sec 29	4	Occurs within the project area.
T49N, R75W, NWSW Sec 3	30	Occurs within the project area.
T50N, R75W, SW Sec 23	41	Occurs just outside of the project area.
T49N, R75W, SESW Sec 3	30	Occurs within the project area.

3.3.5.2.2. 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).

Surveys for greater sage-grouse (*Centrocercus urophasianus*) and sharp-tailed grouse (*Tympanuchus phasianellus*) leks were conducted by Western Land Services on April 1, 3, 5, 8, 10, 11, and 26, 2006 according to established BLM protocol. The surveys were conducted within the project area and extended out two miles from the project boundaries. The project area contains sage-grouse breeding, nesting, and wintering habitat. The project area is occupied by sage-grouse during all seasons.

According to the Wyoming Game and Fish Department database (2006) and surveys conducted by Western Land Services (2006), three sage grouse leks occur within the project area. They are Hayden Sat B, Wasabaugh IV Site A, Wasabaugh IV Site B and one lek which occurs just outside of the northern boundary (Hayden Sat A).

According to the Wyoming Game and Fish Department database (2006), eighteen sage grouse leks occur within six miles of the project boundaries. Based on information from some sage grouse surveys (2006) at least 12 of the 18 leks were active in 2006.

Table 3.3 Sage Grouse Leks Within and Surrounding the Project Area

Lek Name	Activity	UTM N	UTM E	Legal Quarter, Section, Township, Range,	Comments
Hayden I	active	4905718	427849	T50N, R75W SWSW Sec 17	2006-peak males 17, 12 females; active 2001-2006-average male attendance is 20 males.
Hayden Sat. A	active	4905100	431300	T50N,R75W SWNE Sec 22	2006-peak males 2; 2005 active
Hayden Sat B	active	4903436	431273	T50N,R75W SWNW Sec 22	2006-peak males 47; 2005 active-63 males; 2004 active-12 males; 2003 active-22 males.
Hayden II	active	4910500	426300	T51N,R75W SESW Sec 31	2006-peak males 2; 2005 inactive; 2001-2004 active.
Wasabaugh I	active	4902342	434181	T50N,R75W SWSE Sec 31	2006-peak males 34; 2005 active-20 males; 2004 inactive; 2003 active-15 males; 2002 inactive; 2000-2001 active
Wasabaugh II	inactive	4900600	434900	T49N,R75W NENE Sec 1	2006 no birds: 2000-2006 inactive
Wasabaugh III	active	4898900	433500	T49N,R75W NWNW Sec12	2006-peak males 3; 2004-2005 active.
Wasabaugh IV	active	489700	428200	T49N,R75W SENE Sec 17	2006-peak males 40 and 35 females; 2005-34 males and 2004- 7 males.
Wasabaugh IV Site A	active	4899678	424647	T49N,R75W SESW Sec10	2006- peak males 2 and 5females.
Wasabaugh IV Site B	active	4899292	430779	T49N,R75W NESW Sec 9	2006-peak males 1.
Barber Creek	active	4899678	424647	T49N,R76W SWSE Sec 1	2006-peak males 8.
Laskie Draw East	unknown	4900442	421225	T49N,R76W SESW Sec4	2006-no data; 2005-6 males; 2004-3 males.
Laskie Draw	unknown	4899566	419411	T49N,R76W SESW Sec 4	2006- no data; 2005-13 males; 2004-11 males.
Fortification Creek	unknown	4912600	419411	T51N,R76W NWSW Sec 25	2006-No data; 2005-1male; 2000-2004 inactive.
Montgomery	active			T51N,R75W NWNW Sec26	2006-peak males 22; 2005-28 males; 2003-2004 active; active 12 years out of 12 years checked.

Lek Name	Activity	UTM N	UTM E	Legal Quarter, Section, Township, Range,	Comments
Throne	active	4908155	439177	T50N,R74W NESW Sec 9	2006-peak males 7; 2005-9 males
Kingsbury South	unknown	4892800	437600	T49N,R74W SWNE Sec 29	2006-no data; 2000-2005 inactive
Barlow	unknown	4891800	432600	T49N,R75W NESW Sec 35	2006-no data; 2000-2005 inactive

3.3.5.2.3. 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 found throughout the project area according to the 2005 habitat survey, 2005 and 2006 black-tailed prairie dog surveys, and the BLM (Buffalo Field Office) habitat suitability model. On May 3, 19, and June 19, 2006 Western Land Services conducted surveys for mountain plovers. No mountain plovers were observed within the project area.

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 been firmly established in the United States and has continued to spread west. Birds are the natural vector host and serve not only to amplify the virus, but spread it rapidly throughout the country since they are the only known animal to infect mosquitoes. Though less than 1% of mosquitoes are infected with WNV, they still are very effective in transmitting the virus to humans, horses, and wildlife. The *Culex* genus appears to be the most important mosquito group that vector, WNV.

The human health issues related to WNV are well documented and may continue to escalate as the virus moves west. 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

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 4 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 some *Culex* species, 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 area is within the **Upper Powder River** drainage system. For a more detailed description of the watersheds affected by this plan of development, see section 3.5.2 Surface Water below.

3.5.1. Groundwater

WDEQ water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following limits for TDS: 500 mg/l TDS for Drinking Water (Class I), 2000 mg/l for Agricultural Use (Class II) and 5000 mg/l for Livestock Use (Class III).

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

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 17 registered stock and domestic water wells within the POD boundary with depths ranging from 8 to 1040 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 is primarily within the [Barber Creek](#) drainage, a tributary to the Upper Powder River. A small portion of the project area drains to Kingsbury Creek, which is a tributary to Wild Horse Creek, which eventually flows into the Powder River as well. Both of these drainages are ephemeral (flowing only in response to a precipitation event or snow melt) within the project area, except along short reaches which have been converted to perennial flow due to the introduction of CBNG produced water from past projects. The channels are primarily well vegetated grassy swales, mostly without defined beds and banks.

The PRB FEIS presents the historic mean Electrical Conductivity (EC, in $\mu\text{mhos/cm}$) and Sodium Adsorption Ratio (SAR) by watershed at selected United States Geological Survey (USGS) Gauging Stations in Table 3-11 (PRB FEIS page 3-49). These water quality parameters "...illustrate the variability in ambient EC and SAR in streams within the Project Area. The representative stream water quality is used in the impact analysis presented in Chapter 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBNG produced water of varying chemical composition to surface drainages within the Project Area" (PRB FEIS page 3-48). For the Upper Powder River, the EC ranges from 1797 at Maximum monthly flow to 3400 at Low monthly flow and the SAR ranges from 4.76 at Maximum monthly flow to 7.83 at Low monthly flow. These values were determined at the USGS station located on the Powder River at Arvada, Wyoming (PRB FEIS page 3-49).

The operator has stated that no natural springs were located within the project area.

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 Carr Draw II Additions II project prior to on-the-ground project work (BFO project no. 070060200). Western Lands Services conducted a Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) for the project. G.L. "Buck" Damone III, 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 cultural resources are located in or near the area of potential effect.

Table 3.5 Cultural Resources Inventory Results

Site Number	Site Type	Eligibility
48CA163	Prehistoric Site	Unevaluated
48CA193	Historic Site	Not Eligible
48CA2237	Prehistoric Site	Unevaluated
48CA4995	Historic Site	Not Eligible
48CA5198	Historic and Prehistoric Site	Not Eligible
48CA5199	Prehistoric Site	Not Eligible
48CA5758	Historic and Prehistoric Site	Not Eligible
48CA5762	Historic and Prehistoric Site	Not Eligible
48CA5763	Prehistoric Site	Unevaluated
48CA5764	Prehistoric Site	Not Eligible
48CA5779	Prehistoric Site	Not Eligible
48CA5906	Prehistoric Site	Not Eligible
48CA5907	Historic and Prehistoric Site	Not Eligible
48CA5908	Historic Site	Not Eligible
48CA5909	Prehistoric Site	
48CA5910	Prehistoric Site	Not Eligible
48CA5911	Prehistoric Site	Not Eligible
48CA5912	Historic and Prehistoric Site	Not Eligible
48CA5913	Prehistoric Site	Not Eligible

4. ENVIRONMENTAL CONSEQUENCES

The changes to the proposed action in the Carr Draw II Additions II POD, which resulted in development of Alternative C as the preferred alternative, have reduced the potential 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

Overall impacts to vegetation and soils from surface disturbance should be minor, based on the operator's plans and BLM applied mitigation. Of the 96 proposed wells, there are 3 monitoring wells that should involve temporary access and consist of drilling with no further surface disturbance. There are 84 wells that are proposed to be "twin wells", whereby 2 wells are drilled on one location for a total of 42 twin well locations. There are 9 wells that are proposed as a single well per location thus effects are considered for 51 CBNG well locations.

Of the 51 CBNG well locations there are 43 locations plus 3 monitoring well locations that can be drilled without a constructed well pad while 8 locations will require a constructed (cut & fill) pad. As such,

minor surface disturbance would occur with the drilling of the majority of the wells. This disturbance would involve minor 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 43 well locations plus 3 monitoring well locations would involve approximately 0.1 acre/well for 4.6 total acres. The other 8 locations requiring cut & fill pad construction would disturb approximately 0.5 acres per pad for a total of 4 acres. The total estimated disturbance for the drilling all 96 wells would be 8.6 acres. This would be a long-term, minor impact with expedient, successful reclamation and site-stabilization, as committed to by the operator in their POD MSUP and as required by BLM in COAs.

There are no new improved roads being proposed. Access to various well locations will use approximately 9.7 miles of existing improved roads within the project area. Approximately 38 miles of new and existing two-track trails would be utilized to access well sites. The majority of the 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 fewer overall environmental impacts. Approximately 2.7 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, and culverts) 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 only 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	43	0.1acre/location	4.3	Long Term
Constructed Pad	8	0.5 acre/location	4	
Gather/Metering Facilities	0	Site Specific	0	Long Term
Screw Compressors	0	Site Specific	0	Long Term
Monitor Wells	3	0.1/acre	0.3	Long Term
Impoundments	20		90.0	Long Term
On-channel	20	Site Specific	90.0	
Off-channel	0	Site Specific	0.0	
Water Discharge Points	20	Site Specific or 0.01 ac/WDP	0.5	

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Channel Disturbance				
Headcut Mitigation*	0	Site Specific	0.0	
Channel Modification	0	Site Specific	0.0	
Improved Roads	0.0	40' Width or Site Specific	0	Long Term
No Corridor	0		0	
With Corridor	0		0	
2-Track Roads	21.6		100.5	Long Term
No Corridor	1.35	14' Width	2.3	
With Corridor	20.25	40' Width	98.2	
Pipelines	2.67		12.9	Short Term
No Corridor	2.67	40' Width	12.9	
With Corridor	0		0	
Buried Power Cable	0	12' Width		Short Term
Overhead Powerlines	9.13	30' Width	33	Long Term
Additional Disturbance	0	Site Specific	0	0

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

The existing riparian areas that were identified are present due to human-caused interventions such as the development of stock water wells, construction of stockwater dams and reservoirs. CBNG produced water will be added to the reservoirs which may change their chemical nature.

4.1.2. Invasive Species

Utilization of existing facilities and 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 and invasive plants such as spotted knapweed, salt cedar, Canada thistle, and perennial pepperweed.

However, mitigation as required by BLM applied COAs in addition to the Integrated Pest Management Plan (IPMP) submitted by Williams, will reduce potential impacts from noxious weeds and invasive plants. The IPMP for Carr Draw II Addition II, incorporates an integrated weed management strategy which includes the use of weed education, weed-free mulch, weed-free road surfacing, use of weed-free seed during reclamation, and may include physical, biological and chemical controls depending on species, location, landscape and soils.

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 anticipated to be minimal for the following reasons:

- They are proportional to the actual amount of cumulatively produced water in the **Upper Powder River** drainage and the total amount that was predicted in the PRB FEIS, which is only approximately 15% of that total (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 Barber and Kingsbury creeks and to construct additional downstream reservoirs, if necessary, to prevent significant volumes of water from flowing into the Powder River.
- The WMP for the Carr Draw II Additions II proposes that produced water will not contribute significantly to flows downstream.

No additional mitigation measures are required.

4.2. Wildlife

4.2.1. Big Game Direct and Indirect Effects

Under the environmental preferred alternative, yearlong and winter-yearlong range for antelope and year long range for mule deer would be directly disturbed. Table 4.1 summarized the proposed activities, items identified as long term disturbance would be direct habitat loss.

In addition to direct habitat loss, big game would likely be temporarily displaced from the project area during construction and drilling. Surrounding the Carr Draw II Additions II project area, extensive coalbed natural gas development already exists.

A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). The Wyoming Game and Fish Department (WGFD) feels that 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 of roads and facilities (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 human activities associated with operation and maintenance continue to displace big game. Elk and mule deer are more sensitive to operation and maintenance activities than pronghorn antelope, 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.

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 is to be stored in 20 on-channel reservoirs. If a reservoir were to discharge, it is unlikely produced water would reach a fish-bearing stream (the Powder River or the lower reaches of Wild Horse Creek). Downstream species should not be affected.

4.2.2.1. Cumulative effects

WDEQ is aware of the concerns about the effects of water quality and quantity relative to discharge of CBNG produced water directly into ephemeral tributaries of the Powder River. They are taking a conservative approach to permitting until more information can be obtained and their watershed based permitting approach is fully implemented. Long term water quality and flow monitoring that would be required in the WYPDES permits 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).

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).

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).

Density of breeding sage sparrows was reduced by 57% within a 100-m buffer of dirt roads regardless of traffic volume. The density of roads constructed in natural gas fields exacerbated the problem and the area of impact was substantial (Ingelfinger 2004).

With additional reservoirs being constructed, mosquitoes are beginning to inhabit areas within the sagebrush community and exposing more species to the West Nile virus. Due to West Nile virus there could be an increase in mortalities to all species and populations within sagebrush communities may

decrease.

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).

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.

Four wells occur within 900 feet of four raptor nests. Nest BLM ID #2894 is 520 feet from well 43-28. During the onsite the BLM biologist (conducted on 9/6/2006) inspected the nest area to determine the condition and use, the nest was remnants-just a few sticks were left. The nest was inactive in 2006. Nest BLM ID# 2894 is 760 feet from well 43-28, the nest is remnants-a few sticks. Because these nests are likely no longer in use, well moves were not recommended.

Nest BLM ID # 4123 was originally 530 feet from well 23-28, the well was moved 350 south. The new location puts the well 23-28 approximately 550 from the nest, and puts the nest out of line of sight with more of the drainage to provide a buffer for the nest. Moving the well to any other location would cause more surface disturbance and good sage-grouse nesting habitat would be lost.

Raptor nest BLM ID #3545 is 0.17 miles from well 34-4. The BLM was unable to move well outside of the quarter mile buffer, moving the well would cause major surface disturbance. This well site is on a narrow ridge and has steep and deep drainages on both sides.

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 three species that are Threatened or Endangered under the Endangered Species Act. Potential project effects on Threatened and Endangered Species were analyzed in a Biological Assessment and a summary is provided in Table 4.3. Threatened and Endangered Species potentially affected by the proposed project area are 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 (<i>Mustela nigripes</i>)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NS	NLAA	Potential habitat exists within and around the project area, totaling 1,148 acres of active black-tailed prairie dog colonies.
Threatened				
Bald eagle (<i>Haliaeetus leucocephalus</i>)	Mature forest cover often within one mile of large water body.	S	LAA	Project includes overhead power and roads.
Ute ladies'-tresses orchid (<i>Spiranthes diluvialis</i>)	Riparian areas with permanent water	NP	NE	No suitable habitat 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.

Effect Determinations

Listed Species

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

One reservoir and two water lines are proposed within active prairie dog colonies. The locations are listed below:

<i>Township/Range</i>	<i>Section</i>	<i>Affected Wells and Infrastructure</i>
T50N, R75W	NESW 21	Reservoir 23-21
T50N, R75W	NE 26	Proposed water pipeline.
T49N, R75W	SESW 10	Proposed water pipeline.

Approximately 6.41 acres of black-footed ferret habitat will be lost due to reservoir and pipeline construction. The construction of roads, pipelines and reservoirs causes direct prairie dog mortalities and an immediate loss of prairie dog burrows, thus causing direct habitat loss for the black-footed ferret.

Because suitable habitat is of sufficient size within and adjacent to the project area, but it is highly unlikely ferrets are present, implementation of the proposed development may affect, but is not likely to adversely affect the black-footed ferret.

4.2.5.1.2. Bald eagle

Surrounding the project area is extensive natural gas development. Within a ten mile radius of Carr Draw II Additions II project center, there are 312 existing and producing gas wells and 471 proposed gas wells and associated infrastructure. More gas development is planned for the region in the future.

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, such as the Carr Draw II Additions II project area. Twenty-two raptors including 16 golden eagles were electrocuted within Wyoming's Powder River Basin in 2003; 12 electrocutions were on recently constructed lines which did not fully meet APLIC standards (Rogers pers. Comm.). 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.

Surrounding the project area is a network of existing overhead powerlines. Within 12 miles of the project boundaries there are approximately 323 miles of existing overhead powerlines. There are 1.09 miles of existing overhead powerlines within the project area and Williams is proposing to construct an additional 9.13 miles of overhead powerlines within the project boundary. The existing lines are single phase and may or may not be in compliance with the Avian Power Line Interaction Committee's (2006) suggested practices.

Williams is proposing to construct 21.6 miles of two-track roads. 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%).

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%).

Produced water will be stored in 20 proposed reservoir(s) which may attract eagles if reliable prey is present, most likely in the form of waterfowl. The effect of the reservoir(s) on eagles is unknown. The reservoir(s) could prove to be a benefit (e.g. increased food supply) or an adverse effect (e.g. contaminants, proximity of power lines and/or roads to water). Eagle use of reservoirs should be reported to determine the need for any future management.

4.2.5.1.3. Ute's Ladies Tresses Orchid

No Ute Ladies'-tresses Orchid habitat exists within the project area. Implementation of the proposed coal bed natural gas project 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 (<i>Rana pipiens</i>)	Beaver ponds, permanent water in plains and foothills	S	MIIH	Additional water will effect existing waterways.
Spotted frog (<i>Ranus pretiosa</i>)	Ponds, sloughs, small streams	NP	NI	Prairie not mountain habitat.
Birds				
Baird's sparrow (<i>Ammodramus bairdii</i>)	Grasslands, weedy fields	S	MIIH	Sagebrush cover will be affected.
Brewer's sparrow (<i>Spizella breweri</i>)	Basin-prairie shrub	S	MIIH	Sagebrush cover will be affected.
Burrowing owl (<i>Athene cunicularia</i>)	Grasslands, basin-prairie shrub	S	MIIH	Prairie dog colony present.
Ferruginous hawk (<i>Buteo regalis</i>)	Basin-prairie shrub, grasslands, rock outcrops	S	MIIH	Active nest present.
Greater sage-grouse (<i>Centrocercus urophasianus</i>)	Basin-prairie shrub, mountain-foothill shrub	K	WIPV	Sagebrush cover will be affected.
Loggerhead shrike (<i>Lanius ludovicianus</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Sagebrush cover will be affected.
Long-billed curlew (<i>Numenius americanus</i>)	Grasslands, plains, foothills, wet meadows	S	MIIH	Grasslands will be affected.
Mountain plover (<i>Charadrius montanus</i>)	Short-grass prairie with slopes < 5%	S	MIIH	Prairie will be affected.
Northern goshawk (<i>Accipiter gentilis</i>)	Conifer and deciduous forests	NP	NI	No forest habitat present.
Peregrine falcon (<i>Falco peregrinus</i>)	cliffs	NP	NI	No nesting habitat present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Sage sparrow (<i>Amphispiza billneata</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Sagebrush cover will be affected.
Sage thrasher (<i>Oreoscoptes montanus</i>)	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	Sagebrush cover will be affected.
Trumpeter swan (<i>Cygnus buccinator</i>)	Lakes, ponds, rivers	S	MIIH	Reservoirs may provide migratory habitat.
White-faced ibis (<i>Plegadis chihi</i>)	Marshes, wet meadows	NP	NI	Permanently wet meadows not present.
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	Open woodlands, streamside willow and alder groves	NP	NI	Streamside habitats not present
Fish				
Yellowstone cutthroat trout (<i>Oncorhynchus clarki bouvieri</i>)	Mountain streams and rivers in Tongue River drainage	NP	NI	Outside species range.
Mammals				
Black-tailed prairie dog (<i>Cynomys ludovicianus</i>)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	K	MIIH	Prairie dog towns will be affected.
Fringed myotis (<i>Myotis thysanodes</i>)	Conifer forests, woodland chaparral, caves and mines	NP	NI	Habitat not present.
Long-eared myotis (<i>Myotis evotis</i>)	Conifer and deciduous forest, caves and mines	NP	NI	Habitat not present.
Spotted bat (<i>Euderma maculatum</i>)	Cliffs over perennial water.	NP	NI	Cliffs & perennial water not present.
Swift fox (<i>Vulpes velox</i>)	Grasslands	S	MIIH	Grassland habitat and prairie dog colonies will be affected.
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	Caves and mines.	NP	NI	Habitat not present.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Plants				
Porter's sagebrush (<i>Artemisia porteri</i>)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (<i>Cymopterus williamsii</i>)	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.

MIH 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. Black-tailed prairie dog

One reservoir and two water lines are proposed within active prairie dog colonies. The locations are listed below:

<i>Township/Range</i>	<i>Section</i>	<i>Affected Wells and Infrastructure</i>
T50N, R75W	NESW 21	Reservoir 23-21
T50N, R75W	NE 26	Proposed water pipeline.
T49N, R75W	SESW 10	Proposed water pipeline.

Approximately 6.41 acres of black-tailed prairie dog habitat will be lost due to reservoir and pipeline construction.

4.2.5.2.2. 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 (Theiele 2005, Oedekoven 2004). 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).

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.

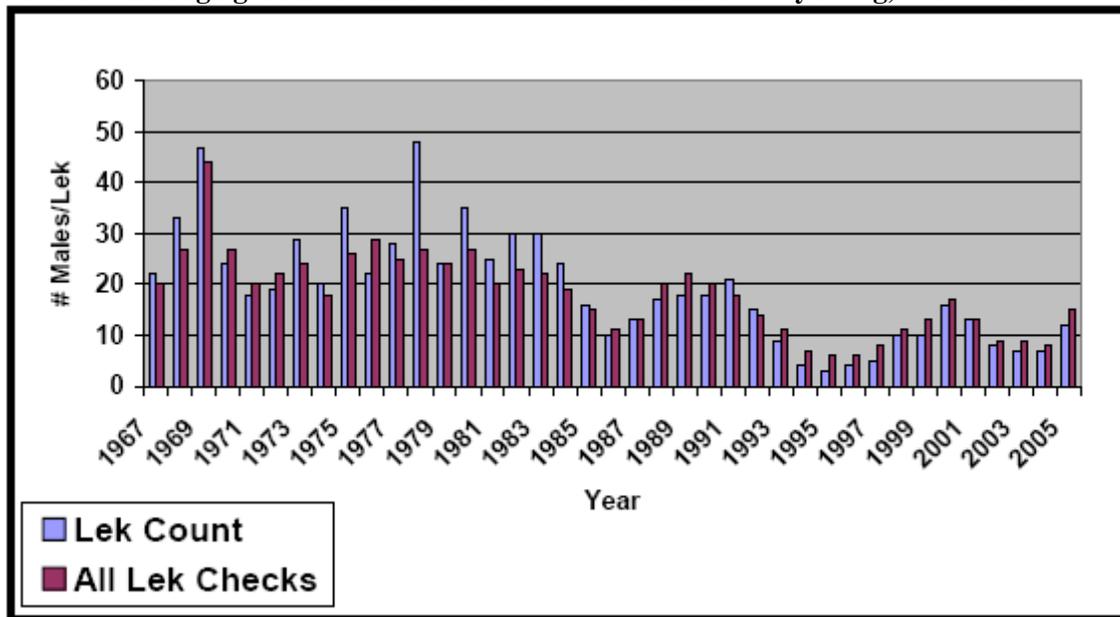
Additional studies, across more of the sage-grouse's range, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported only 45% of their sage grouse hens nested within 3 km (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 Holloran 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 CBNG 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 likely insufficient to reverse the population decline. Moynahan and Lindberg (2004) like WAFWA (Connelly 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).

4.2.5.2.3. Mountain plover

Mineral development may have mixed effects on mountain plovers. Disturbed ground such as buried pipe line corridors and roads may be attractive to plovers while human activities within one-quarter mile may be disruptive. Use of roads and pipe line corridors by mountain plovers may increase their vulnerability to vehicle collision. The existing overhead power lines provide perch sites for raptors potentially

resulting in increased mountain plover predation. CBNG infrastructure such as the well houses, roads, pipe line corridors, and nearby metering facilities may provide shelter and den sites for ground predators such as skunks and foxes. An analysis of direct and indirect impacts to mountain plover due to oil and gas development is included in the PRB FEIS (4-254-255).

Suitable mountain plover habitat is present within the project area. The project may adversely affect mountain plovers.

Mountain plovers may suffer twice if black –tailed prairie dogs vanish. First, there is the out right loss of traditional breeding habitat. When prairie dogs disappear, the colony can become unsuitable for mountain plovers in just a few weeks, as the vegetation quickly becomes a foot or two tall. With the loss or alteration of their natural breeding habitat, mountain plovers have been forced to seek habitat with similar qualities that may be poor quality habitat. Such as heavily grazed land, burned fields, fallow agriculture lands, roads, oil and gas well pads and pipelines, these areas could become reproductive sinks. Adult mountain plovers may breed there and lay eggs and hatch chicks, however the young may not reach fledging age due to the poor quality of the habitat.

Recent analysis of the US Fish and Wildlife Service (USFWS) Breeding Bird Survey (BBS) data suggests that mountain plover populations have declined at an annual rate of 3.7 % over the last 30 years which represents a cumulative decline of 63% during the last 25 years (Knopf 1995).

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

The PRB FEIS and ROD included a programmatic mitigation measure that states, “The BLM will consult with appropriate state agencies regarding WNV. If determined to be necessary, a COA will be applied at the time of APD approval to treat mosquitoes for any CBNG discharge waters that become stagnant.” 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 CBNG operations.

Cumulatively, there are many sources of standing water, beyond CBNG 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. Based on current information, we determined that no significant impacts in the spread of WNV would occur from the implementation of this project.

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 watershed 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), should minimize project area and downstream potential 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 15.0 gpm per well or 1410.0 gpm (3.15 cfs or 2275 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 CBNG 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 171,423 acre-feet in 2006 (2006 was also the predicted year of maximum production). As such, the volume of water resulting from the production of these wells is 1% of the total volume projected for 2006, which will result in an insignificant increase to the present volume of water produced from coal bed natural gas in the Powder River Basin. 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 (PRB FEIS pg 4-5). For this action, it may be assumed that a maximum of 564 gpm will infiltrate at or near the discharge points and impoundments (910 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 III or better) the operator is required to establish a groundwater monitoring program at those impoundments.

Shallow ground water monitoring is ongoing at numerous 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 variability in 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. The Wyoming DEQ has also 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 ground water. WYPDES permits received by DEQ prior to August 1, 2004, for discharging to impoundments will be assessed through the “Impoundment Monitoring Plan”. For WYPDES permits received by DEQ after August 1, 2004, the BLM will require that operators comply with the requirements outlined in the DEQ compliance monitoring guidance document (June 14,

2004) prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is possible impacts to the groundwater. “The effects of development of CBNG 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 water wells in the area. The permitted water wells in the area produce from water bearing zones ranging in depth from 8 to 1040 feet below the ground surface. The targeted coal zones range from 1200 to 2160 feet below ground surface. 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 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 analyses submitted for the pre-approval evaluation, the operator has committed to designate a reference well within the POD boundary. The well will be capable of being sampled at the wellhead. A sample will be collected at the wellhead for analysis within sixty days of initial production. A copy of the water analysis will be submitted to the BLM Authorizing Officer.

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 watershed for SAR, and EC, the average value measured at selected USGS gauging 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 permit, 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 –		3	1000
Least Restrictive Proposed Limit		10	3000
Powder River at Arvada, WY			
Historic Data Average at Maximum Flow		4.76	1797
Historic Data Average at Minimum Flow		7.83	3400
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8)			
Domestic (Household) Use (Class I)	500		
Agricultural Use (Class II)	2,000	8	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0049999			
At discharge point	5000	XXX	7500
WYPDES Permit # WY0048691			
At discharge point	5000	-----	7500
At the Irrigation Compliance Point		6	2000
WYPDES Permit # WY0053171			
At discharge point	5000	--	7500
At the Irrigation Compliance Point	-----	18	3000
Predicted Produced Water Quality			
Big George	1230	18.4	1900
Werner	1720	17.2	2660
Gates/Wall	1300	18.2	2010

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 ranges from 1230 to 1720 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). However direct land application is not included in this proposal. If at any future time the operator entertains the possibility of irrigation or land application with the water produced from these wells, the proposal must be submitted as a sundry notice for separate environmental analysis and approval by the BLM.

The quality for the water produced from the Werner target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD (sections 21 and 28 of T.50N, R.75W). A maximum of 15.0 gallons per minute (gpm) is projected is to be produced from these 51 wells, for a total of 765 gpm for the POD. See Table 4.4 .

The quality for the water produced from the Gates/Wall target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD. A maximum of 15.0 gpm is projected is to be produced from these 51 wells, for a total of 765 gpm for the POD. See Table 4.4.

The quality for the water produced from the Big George target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD. A maximum of 15.0 gpm is projected is to be produced from these 43 wells, for a total of 645gpm for the POD. See Table 4.4.

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

There are 20 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, 20 impoundments (451 acre feet) would potentially be constructed within the project area. These impoundments will disturb approximately 90.0 acres including the dam structures. All 20 of these water impoundments would be on-channel reservoirs. Monitoring may be required based upon WYDEQ findings relative to “Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments” (June 14, 2004). 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 0.5 cfs below the lowest reservoir (after infiltration and evapotranspiration losses). 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 at a total contribution to the mainstem of the Upper Powder River of 68 cfs (PRB FEIS pg 4-86). The predicted maximum discharge rate from these 96 wells is anticipated to be a total of 1440.0 gpm or 3.2 cfs to impoundments. Using an assumed conveyance loss of 20% (PRB FEIS pg 4-74) and full containment the produced water re-surfacing in all drainages from this action (0.5 cfs) may add a maximum 0.4 cfs to the Upper Powder River flows, or 0.6% of the predicted total CBNG produced water contribution. This incremental volume is statistically below the measurement capabilities for the volume of flow in the Upper Powder River, except during periods of extremely low or no flow (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). The addition of the water produced from these wells will not significantly impact the water quantity in the mainstem of the Upper Powder River. 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 page 11). Based on the area of the Barber Creek watershed above the POD and an assumed density of one well per location every 80 acres, the potential exists for the development of 108 wells which could produce a maximum flow rate of 1620 gpm (3.6 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 potential maximum flow rate of produced water within the watershed upstream of the project area, 3.6 cfs, is much less than the volume of runoff estimated from the 2-year storm event for Barber Creek within the project area. Therefore, the estimated flow rate of water produced from the full development in the watershed above the project area is significantly less than the natural runoff from the area.

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 three Wyoming Pollutant Discharge Elimination System (WYPDES) permits for the discharge of water produced as a result of this and other projects from the WDEQ.

Permit effluent limits for WY0049999 were set at (WYPDES Part I, page 2):

Total Petroleum Hydrocarbons	10 mg/l max
pH	6.5 to 8.5
TDS	5000 mg/l max
Specific Conductance	7500 μ S/cm
Sulfates	3000 mg/l max
Radium 226	1 pCi/l max
Dissolved iron	1000 μ g/l max
Dissolved manganese	630 μ g/l max
Total Barium	1800 μ g/l max
Total Arsenic	7 μ g/l max
Chlorides	46 mg/l

Permit effluent limits for WY0053171 were set at (WYPDES Part I, page 2):

pH	6.5 to 8.5
TDS	5000 mg/l max
Specific Conductance	3000 μ S/cm
Sulfates	3000 mg/l max
Dissolved iron	1000 μ g/l max
Dissolved manganese	630 μ g/l max
Total Barium	1800 μ g/l max
Total Arsenic	7 μ g/l max
Chlorides	46 mg/l

Permit effluent limits for WY0048691 were set at (WYPDES page 2):

Total Petroleum Hydrocarbons	10 mg/l max	At ICP
pH	6.5 to 8.5	
TDS	5000 mg/l max	
Specific Conductance	7500 μ S/cm	2000 μ S/cm
Sulfates	3000 mg/l max	
Radium 226	1 pCi/l max	
Dissolved iron	1000 μ g/l max	
Dissolved manganese	630 μ g/l max	
Total Barium	1800 μ g/l max	
Total Arsenic	7 μ g/l max	
Chlorides	46 mg/l	
SAR		6 (unitless)

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 pipe for the discharge points.

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 designating 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.

In-channel downstream impacts are addressed in the WMP for the Carr Draw II Additions II POD prepared by Western Land Services for Williams Production, RMT.

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 River watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

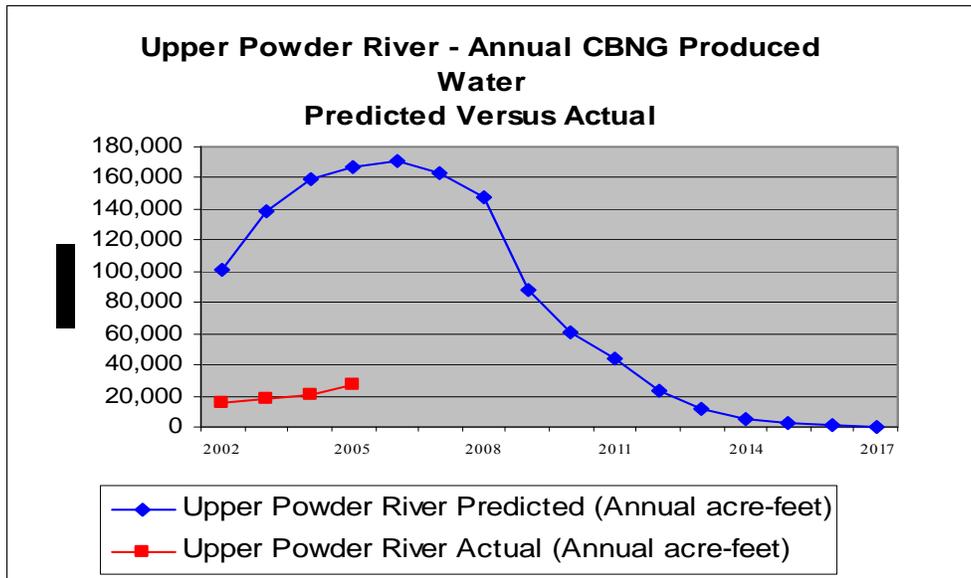
As of December 2005, all producing CBNG wells in the Upper Powder River watershed have discharged a cumulative volume of 83,072 acre-ft of water compared to the predicted 565,096 acre-ft disclosed in the PRB FEIS (Table 2-8 page 2-26). These figures are presented graphically in Figure 4.1 and Table 4.6 following. This volume is 15% 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 2005 Data Updated 4-5-06

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-foot)		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	27,658	16.5	83,072	14.7
2006	171,423	736,519				
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				

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
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				
Total	1,285,233					

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



The PRB FEIS identified downstream irrigation water quality as the primary issue for CBNG produced water. 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 CBNG development in both states continued. As the two states develop a better understanding of the effects of CBNG 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)

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 anticipated to be

minimal for the following reasons:

1. They are proportional to the actual amount of cumulatively produced water in the Upper Powder River drainage and the total amount that was predicted in the PRB FEIS, which is only approximately 15% of that total (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, page 4-115 – 117 and table 4-13 for cumulative effects relative to the Upper Powder River watershed and page 117 for cumulative effects common to all sub-watersheds.

4.5. Cultural Resources

Non-eligible sites 48CA193, 48CA5198, 48CA5199, 48CA4995, 48CA5758, 48CA5779 and 48CA5910 will be impacted by the proposed project. According to the Wyoming State Protocol Section VI (A)(1) the Bureau of Land Management notified the Wyoming State Historic Preservation Officer (SHPO) that it determined 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
Randee Jespersen	Land Manager	Williams Production RMT	Yes
Duane Joslyn	Operation Supervisor	Williams Production RMT	Yes
Rex Lynde	Drilling	Williams Production RMT	Yes
Ralph Demel	Construction Forman	Western Land Services	Yes
Patrick Bancor	Project Manager	Western Land Services	Yes
Peggy Carter	Hydrologist	Williams Production RMT	Yes
Alen Jones	Hydrologist	Western Land Services	Yes
Allen Aksamit	Wildlife Biologist	Western Land Services	Yes
Joe Maycock	Surface Owner	Surface Owner	Yes
Todd Merchen	Civil Engineer	Lowhan Engineering	Yes
Sara Needles	Wyoming SHPO	Wyoming SHPO	No
Brad Rodgers	Wildlife Biologist	US Fish and Wildlife	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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8. LIST OF INTERDISCIPLINARY TEAM PREPARERS AND REVIEWERS

Jennifer Spegon, Natural Resource Specialist
Randy Nordsvan, Supervisory Natural Resource Specialist
Ben Adams, Hydrologist
Al Sprague and Lee Harrelson, Civil Engineers
Dane Geyer, Petroleum Engineer
Denise Oliverius, Legal Instruments Examiner
G.L. "Buck" Damone III, Archaeologist
Guymen Easdale, Wildlife Biologist
Gerald Queen, Geologist
Tom Bills, NEPA Coordinator
Paul Beels, Assistant Field Manager, Minerals & Lands
Chris E. Hanson, Field Manager

Interdisciplinary Team Lead: Jennifer Spegon