

**FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD  
FOR**

**Williams Production RMT Company  
Carr Draw I Add I**

**ENVIRONMENTAL ASSESSMENT –WY-070-07-071**

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Williams Production RMT Company’s Carr Draw I Add I Coal Bed Natural Gas (CBNG) POD comprised of the following 48 Applications for Permit to Drill (APDs), as follows:

	<b>Well Name</b>	<b>Well #</b>	<b>Qtr/Qtr</b>	<b>Sec</b>	<b>TWP</b>	<b>RNG</b>	<b>Lease #</b>
1	CARR DRAW 1 ADD 1 LOVE L&C	14-3GW*	SWSW	3	50N	75W	WYW162026
2	CARR DRAW 1 ADD 1 LOVE L&C	14-4BG	SWSW	4	50N	75W	WYW146810
3	CARR DRAW 1 ADD 1 LOVE L&C	14-4GW	SWSW	4	50N	75W	WYW146810
4	CARR DRAW 1 ADD 1 LOVE L&C	43-4BG	NESE	4	50N	75W	WYW162026
5	CARR DRAW 1 ADD 1 LOVE L&C	43-4GW	NESE	4	50N	75W	WYW162026
6	CARR DRAW 1 ADD 1 LOVE L&C	12-5BG	SWNW	5	50N	75W	WYW146810
7	CARR DRAW 1 ADD 1 LOVE L&C	12-5GW	SWNW	5	50N	75W	WYW146810
8	CARR DRAW 1 ADD 1 LOVE L&C	14-5BG	SWSW	5	50N	75W	WYW53240
9	CARR DRAW 1 ADD 1 LOVE L&C	14-5GW	SWSW	5	50N	75W	WYW53240
10	CARR DRAW 1 ADD 1 LOVE L&C	21-5BG	NENW	5	50N	75W	WYW146810
11	CARR DRAW 1 ADD 1 LOVE L&C	21-5GW	NENW	5	50N	75W	WYW146810
12	CARR DRAW 1 ADD 1 LOVE L&C	23-5BG	NESW	5	50N	75W	WYW146810
13	CARR DRAW 1 ADD 1 LOVE L&C	23-5GW	NESW	5	50N	75W	WYW146810
14	CARR DRAW 1 ADD 1 LOVE L&C	32-5BG	SWNE	5	50N	75W	WYW146810
15	CARR DRAW 1 ADD 1 LOVE L&C	32-5GW	SWNE	5	50N	75W	WYW146810
16	CARR DRAW 1 ADD 1 LOVE L&C	34-5BG	SWSE	5	50N	75W	WYW146810
17	CARR DRAW 1 ADD 1 LOVE L&C	34-5GW	SWSE	5	50N	75W	WYW146810
18	CARR DRAW 1 ADD 1 LOVE L&C	43-6BG	NESE	6	50N	75W	WYW47681
19	CARR DRAW 1 ADD 1 LOVE L&C	43-6GW	NESE	6	50N	75W	WYW47681
20	CARR DRAW 1 ADD 1 CARU	21-8BG	NENW	8	50N	75W	WYW133613
21	CARR DRAW 1 ADD 1 CARU	21-8GW	NENW	8	50N	75W	WYW133613
22	CARR DRAW 1 ADD 1 CARU	43-8BG	NESE	8	50N	75W	WYW133613
23	CARR DRAW 1 ADD 1 CARU	43-8GW	NESE	8	50N	75W	WYW133613
24	CARR DRAW 1 ADD 1 CARU	23-9BG	NESW	9	50N	75W	WYW133613
25	CARR DRAW 1 ADD 1 CARU	23-9GW	NESW	9	50N	75W	WYW133613
26	CARR DRAW 1 ADD 1 LOVE L&C	12-10BG	SWNW	10	50N	75W	WYW162026
27	CARR DRAW 1 ADD 1 LOVE L&C	12-10GW	SWNW	10	50N	75W	WYW162026
28	CARR DRAW 1 ADD 1 LOVE L&C	43-10GW	NESE	10	50N	75W	WYW133614
29	CARR DRAW 1 ADD 1 LOVE L&C	32-15GW	SWNE	15	50N	75W	WYW133614
30	CARR DRAW 1 ADD 1 LOVE L&C	12-22BG	SWNW	22	50N	75W	WYW39563
31	CARR DRAW 1 ADD 1 LOVE L&C	12-22GW	SWNW	22	50N	75W	WYW39563
32	CARR DRAW 1 ADD 1 LOVE L&C	21-22BG	NENW	22	50N	75W	WYW39563
33	CARR DRAW 1 ADD 1 LOVE L&C	21-22GW	NENW	22	50N	75W	WYW39563

	<b>Well Name</b>	<b>Well #</b>	<b>Qtr/Qtr</b>	<b>Sec</b>	<b>TWP</b>	<b>RNG</b>	<b>Lease #</b>
34	CARR DRAW 1 ADD 1 LOVE L&C	41-22GW	NENE	22	50N	75W	WYW39563
35	CARR DRAW 1 ADD 1 LOVE L&C	43-22GW	NESE	22	50N	75W	WYW39563
36	CARR DRAW 1 ADD 1 LOVE L&C	12-23GW	SWNW	23	50N	75W	WYW39563
37	CARR DRAW 1 ADD 1 LOVE L&C	21-23GW	NENW	23	50N	75W	WYW39563
38	CARR DRAW 1 ADD 1 LOVE L&C	23-23GW	NESW	23	50N	75W	WYW39563
39	CARR DRAW 1 ADD 1 LOVE L&C	32-23GW	SWNE	23	50N	75W	WYW39563
40	CARR DRAW 1 ADD 1 LOVE L&C	41-23GW	NENE	23	50N	75W	WYW39563
41	CARR DRAW 1 ADD 1 LOVE L&C	43-23GW	NESE	23	50N	75W	WYW39563
42	CARR DRAW 1 ADD 1 LOVE L&C	12-24GW	SWNW	24	50N	75W	WYW5343
43	CARR DRAW 1 ADD 1 LOVE L&C	14-24GW	SWSW	24	50N	75W	WYW5343
44	CARR DRAW 1 ADD 1 LOVE L&C	21-24GW	NENW	24	50N	75W	WYW5343
45	CARR DRAW 1 ADD 1 LOVE L&C	23-24GW	NESW	24	50N	75W	WYW5343
46	CARR DRAW 1 ADD 1 LOVE L&C	32-24GW	SWNE	24	50N	75W	WYW5343
47	CARR DRAW 1 ADD 1 LOVE L&C	34-24GW	SWSE	24	50N	75W	WYW5343
48	CARR DRAW 1 ADD 1 LOVE L&C	42-24GW	SENE	24	50N	75W	WYW5343

**CBNG produced water impoundments and outfalls**

	<b>Impoundment</b>					<b>Mineral Ownership</b>	<b>WYPDES #</b>
	<b>Name/Number</b>	<b>Qtr/Qtr</b>	<b>Sec</b>	<b>TWP</b>	<b>RNG</b>	<b>Federal Lease #</b>	<b>Outfall #</b>
1	LOVE 11-10-5075	NWNW	10	50N	75W	WYW-162026	PENDING-002
2	LOVE 11-10-5075 B	NWNW	10	50N	75W	WYW-162026	PENDING-001
3	LOVE 11-15-5075	NWNW	15	50N	75W	FEE	PENDING-004
4	LOVE 11-15-5075 B	NWNW	15	50N	75W	FEE	PENDING-026
5	LOVE 14-10-5075	SWSW	10	50N	75W	STATE	PENDING-015
6	LOVE 21-08-5075	NENW	8	50N	75W	WYW-133613	PENDING-009
7	LOVE 21-16-5075	NENW	16	50N	75W	STATE	PENDING-029
8	LOVE 22-10-5075	SENW	10	50N	75W	WYW-162026	PENDING-018
9	LOVE 22-16-5075	SENW	16	50N	75W	STATE	PENDING-028
10	LOVE 23-09-5075	NESW	9	50N	75W	WYW-133613	PENDING-010
11	LOVE 24-04-5075	SESW	4	50N	75W	FEE	PENDING-007
12	LOVE 24-10-5075	SESW	10	50N	75W	STATE	PENDING-016
13	LOVE 31-10-5075	NWNE	10	50N	75W	FEE	PENDING-019
14	LOVE 31-22-5075	NWNE	22	50N	75W	FEE	PENDING-033
15	LOVE 33-04-5075	NWSE	4	50N	75W	WYW-129537	PENDING-005
16	LOVE 33-04-5075 B	NWSE	4	50N	75W	WYW-129537	PENDING-006
17	LOVE 33-15-5075	NWSE	15	50N	75W	FEE	PENDING-021
18	LOVE 33-15-5075 B	NWSE	15	50N	75W	FEE	PENDING-022
19	LOVE 33-15-5075 C	NWSE	15	50N	75W	FEE	PENDING-024
20	LOVE 33-15-5075 D	NWSE	15	50N	75W	FEE	PENDING-025
21	LOVE 34-10-5075	SWSE	10	50N	75W	STATE	PENDING-017
22	LOVE 34-16-5075	SWSE	16	50N	75W	STATE	PENDING-031
23	LOVE 41-10-5075	NENE	10	50N	75W	FEE	PENDING-020
24	LOVE 41-16-5075	NENE	16	50N	75W	STATE	PENDING-027
25	LOVE 41-21-5075	NENE	21	50N	75W	FEE	PENDING-030

	Impoundment					Mineral Ownership	WYPDES #
	Name/Number	Qtr/Qtr	Sec	TWP	RNG	Federal Lease #	Outfall #
26	LOVE 43-04-5075	NESE	4	50N	75W	WYW-162026	PENDING-034
27	LOVE 43-09-5075	NESE	9	50N	75W	FEE	PENDING-013
28	LOVE 43-15-5075	NESE	15	50N	75W	FEE	PENDING-023
29	LOVE 44-04-5075	SESE	4	50N	75W	WYW-162026	PENDING-003
30	LOVE 44-04-5075 B	SESE	4	50N	75W	WYW-162026	PENDING-002
31	LOVE 44-09-5075	SESE	9	50N	75W	WYW-157757	PENDING-014
32	LOVE 21-22-5075	SWSE	22	50N	75W	WYW-39563	PENDING-035
33	LOVE 34-16-5075B	NENW	16	50N	75W	STATE	PENDING-032
34	LOVE 43-23-5075	NESE	23	50N	75W	WYW-39563	WY0054208-001
35	SHEEPCAMP	SWNW	23	50N	75W	WYW-5343	WY0054208-002

**Existing dams previously evaluated and approved in the Carr Draw I POD, EA # WY-070-05-260, and included with this water management strategy.**

36	AMORE	NWNW	23	50N	75W	WYW-39563	WY0049999-007
37	CORI	SENW	15	50N	75W	FEE	WY0049999-003
38	LOVE	NESE	16	50N	75W	STATE	WY0049999-004
39	JULY	NWNW	10	50N	75W	WYW-162026	WY0049999-010
40	FORTIFICATION	SENE	9	50N	75W	FEE	WY0049999-002
41	FORTIFY	NWNE	9	50N	75W	FEE	WY0049999-001

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.

**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 Company  
Carr Draw I Add I  
PLAN OF DEVELOPMENT  
WY-070-07-071**

## **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 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.

#### **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 Company’s Carr Draw I Add I Plan of Development (POD) for 48 coal bed natural gas well APD’s and associated infrastructure.

Proposed Well Information: There are 48 wells proposed within this POD, as follows:

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
1	CARR DRAW 1 ADD 1 LOVE L&C	14-3GW*	SWSW	3	50N	75W	WYW162026
2	CARR DRAW 1 ADD 1 LOVE L&C	14-4BG	SWSW	4	50N	75W	WYW146810
3	CARR DRAW 1 ADD 1 LOVE L&C	14-4GW	SWSW	4	50N	75W	WYW146810
4	CARR DRAW 1 ADD 1 LOVE L&C	43-4BG	NESE	4	50N	75W	WYW162026
5	CARR DRAW 1 ADD 1 LOVE L&C	43-4GW	NESE	4	50N	75W	WYW162026
6	CARR DRAW 1 ADD 1 LOVE L&C	12-5BG	SWNW	5	50N	75W	WYW146810
7	CARR DRAW 1 ADD 1 LOVE L&C	12-5GW	SWNW	5	50N	75W	WYW146810
8	CARR DRAW 1 ADD 1 LOVE L&C	14-5BG	SWSW	5	50N	75W	WYW53240
9	CARR DRAW 1 ADD 1 LOVE L&C	14-5GW	SWSW	5	50N	75W	WYW53240
10	CARR DRAW 1 ADD 1 LOVE L&C	21-5BG	NENW	5	50N	75W	WYW146810
11	CARR DRAW 1 ADD 1 LOVE L&C	21-5GW	NENW	5	50N	75W	WYW146810
12	CARR DRAW 1 ADD 1 LOVE L&C	23-5BG	NESW	5	50N	75W	WYW146810
13	CARR DRAW 1 ADD 1 LOVE L&C	23-5GW	NESW	5	50N	75W	WYW146810
14	CARR DRAW 1 ADD 1 LOVE L&C	32-5BG	SWNE	5	50N	75W	WYW146810
15	CARR DRAW 1 ADD 1 LOVE L&C	32-5GW	SWNE	5	50N	75W	WYW146810
16	CARR DRAW 1 ADD 1 LOVE L&C	34-5BG	SWSE	5	50N	75W	WYW146810
17	CARR DRAW 1 ADD 1 LOVE L&C	34-5GW	SWSE	5	50N	75W	WYW146810
18	CARR DRAW 1 ADD 1 LOVE L&C	43-6BG	NESE	6	50N	75W	WYW47681
19	CARR DRAW 1 ADD 1 LOVE L&C	43-6GW	NESE	6	50N	75W	WYW47681
20	CARR DRAW 1 ADD 1 CARU	21-8BG	NENW	8	50N	75W	WYW133613
21	CARR DRAW 1 ADD 1 CARU	21-8GW	NENW	8	50N	75W	WYW133613
22	CARR DRAW 1 ADD 1 CARU	43-8BG	NESE	8	50N	75W	WYW133613
23	CARR DRAW 1 ADD 1 CARU	43-8GW	NESE	8	50N	75W	WYW133613
24	CARR DRAW 1 ADD 1 CARU	23-9BG	NESW	9	50N	75W	WYW133613
25	CARR DRAW 1 ADD 1 CARU	23-9GW	NESW	9	50N	75W	WYW133613
26	CARR DRAW 1 ADD 1 LOVE L&C	12-10BG	SWNW	10	50N	75W	WYW162026
27	CARR DRAW 1 ADD 1 LOVE L&C	12-10GW	SWNW	10	50N	75W	WYW162026
28	CARR DRAW 1 ADD 1 LOVE L&C	43-10GW	NESE	10	50N	75W	WYW133614
29	CARR DRAW 1 ADD 1 LOVE L&C	32-15GW	SWNE	15	50N	75W	WYW133614
30	CARR DRAW 1 ADD 1 LOVE L&C	12-22BG	SWNW	22	50N	75W	WYW39563
31	CARR DRAW 1 ADD 1 LOVE L&C	12-22GW	SWNW	22	50N	75W	WYW39563
32	CARR DRAW 1 ADD 1 LOVE L&C	21-22BG	NENW	22	50N	75W	WYW39563
33	CARR DRAW 1 ADD 1 LOVE L&C	21-22GW	NENW	22	50N	75W	WYW39563
34	CARR DRAW 1 ADD 1 LOVE L&C	41-22GW	NENE	22	50N	75W	WYW39563
35	CARR DRAW 1 ADD 1 LOVE L&C	43-22GW	NESE	22	50N	75W	WYW39563
36	CARR DRAW 1 ADD 1 LOVE L&C	12-23GW	SWNW	23	50N	75W	WYW39563
37	CARR DRAW 1 ADD 1 LOVE L&C	21-23GW	NENW	23	50N	75W	WYW39563
38	CARR DRAW 1 ADD 1 LOVE L&C	23-23GW	NESW	23	50N	75W	WYW39563
39	CARR DRAW 1 ADD 1 LOVE L&C	32-23GW	SWNE	23	50N	75W	WYW39563
40	CARR DRAW 1 ADD 1 LOVE L&C	41-23GW	NENE	23	50N	75W	WYW39563
41	CARR DRAW 1 ADD 1 LOVE L&C	43-23GW	NESE	23	50N	75W	WYW39563
42	CARR DRAW 1 ADD 1 LOVE L&C	12-24GW	SWNW	24	50N	75W	WYW5343

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
43	CARR DRAW 1 ADD 1 LOVE L&C	14-24GW	SWSW	24	50N	75W	WYW5343
44	CARR DRAW 1 ADD 1 LOVE L&C	21-24GW	NENW	24	50N	75W	WYW5343
45	CARR DRAW 1 ADD 1 LOVE L&C	23-24GW	NESW	24	50N	75W	WYW5343
46	CARR DRAW 1 ADD 1 LOVE L&C	32-24GW	SWNE	24	50N	75W	WYW5343
47	CARR DRAW 1 ADD 1 LOVE L&C	34-24GW	SWSE	24	50N	75W	WYW5343
48	CARR DRAW 1 ADD 1 LOVE L&C	42-24GW	SENE	24	50N	75W	WYW5343

CBNG Produced Water Impoundment Information: There are 41 dams and reservoirs with associated outfalls, six are existing and 35 are proposed for construction in this plan of development.

	Impoundment					Mineral Owner	WYPDES #
	Name/Number	Qtr/Qtr	Sec	TWP	RNG	Federal Lease #	Outfall #
1	LOVE 11-10-5075	NWNW	10	50N	75W	WYW-162026	PENDING-002
2	LOVE 11-10-5075 B	NWNW	10	50N	75W	WYW-162026	PENDING-001
3	LOVE 11-15-5075	NWNW	15	50N	75W	FEE	PENDING-004
4	LOVE 11-15-5075 B	NWNW	15	50N	75W	FEE	PENDING-026
5	LOVE 14-10-5075	SWSW	10	50N	75W	STATE	PENDING-015
6	LOVE 21-08-5075	NENW	8	50N	75W	WYW-133613	PENDING-009
7	LOVE 21-16-5075	NENW	16	50N	75W	STATE	PENDING-029
8	LOVE 22-10-5075	SENE	10	50N	75W	WYW-162026	PENDING-018
9	LOVE 22-16-5075	SENE	16	50N	75W	STATE	PENDING-028
10	LOVE 23-09-5075	NESW	9	50N	75W	WYW-133613	PENDING-010
11	LOVE 24-04-5075	SESW	4	50N	75W	FEE	PENDING-007
12	LOVE 24-10-5075	SESW	10	50N	75W	STATE	PENDING-016
13	LOVE 31-10-5075	NWNE	10	50N	75W	FEE	PENDING-019
14	LOVE 31-22-5075	NWNE	22	50N	75W	FEE	PENDING-033
15	LOVE 33-04-5075	NWSE	4	50N	75W	WYW-129537	PENDING-005
16	LOVE 33-04-5075 B	NWSE	4	50N	75W	WYW-129537	PENDING-006
17	LOVE 33-15-5075	NWSE	15	50N	75W	FEE	PENDING-021
18	LOVE 33-15-5075 B	NWSE	15	50N	75W	FEE	PENDING-022
19	LOVE 33-15-5075 C	NWSE	15	50N	75W	FEE	PENDING-024
20	LOVE 33-15-5075 D	NWSE	15	50N	75W	FEE	PENDING-025
21	LOVE 34-10-5075	SWSE	10	50N	75W	STATE	PENDING-017
22	LOVE 34-16-5075	SWSE	16	50N	75W	STATE	PENDING-031
23	LOVE 41-10-5075	NENE	10	50N	75W	FEE	PENDING-020
24	LOVE 41-16-5075	NENE	16	50N	75W	STATE	PENDING-027
25	LOVE 41-21-5075	NENE	21	50N	75W	FEE	PENDING-030
26	LOVE 43-04-5075	NESE	4	50N	75W	WYW-162026	PENDING-034
27	LOVE 43-09-5075	NESE	9	50N	75W	FEE	PENDING-013
28	LOVE 43-15-5075	NESE	15	50N	75W	FEE	PENDING-023
29	LOVE 44-04-5075	SESE	4	50N	75W	WYW-162026	PENDING-003
30	LOVE 44-04-5075 B	SESE	4	50N	75W	WYW-162026	PENDING-002
31	LOVE 44-09-5075	SESE	9	50N	75W	WYW-157757	PENDING-014
32	LOVE 21-22-5075	SWSE	22	50N	75W	WYW-39563	PENDING-035
33	LOVE 34-16-5075B	NENW	16	50N	75W	STATE	PENDING-032
34	LOVE 43-23-5075	NESE	23	50N	75W	WYW-39563	WY0054208-001

	<b>Impoundment</b>					<b>Mineral Owner</b>	<b>WYPDES #</b>
	<b>Name/Number</b>	<b>Qtr/Qtr</b>	<b>Sec</b>	<b>TWP</b>	<b>RNG</b>	<b>Federal Lease #</b>	<b>Outfall #</b>
35	SHEEPCAMP	SWNW	23	50N	75W	WYW-5343	WY0054208-002

The following existing dams were approved under the original Carr Draw I POD, EA # **WY-070-05-260**, and are part of this project’s water management plan.

	<b>Impoundment</b>						<b>WYPDES #</b>
	<b>Name/Number</b>	<b>Qtr/Qtr</b>	<b>Section</b>	<b>TWP</b>	<b>RNG</b>	<b>Lease Number</b>	<b>Outfall #</b>
36	AMORE	NWNW	23	50N	75W	WYW-39563	WY0049999-007
37	CORI	SENW	15	50N	75W	FEE	WY0049999-003
38	LOVE	NESE	16	50N	75W	STATE	WY0049999-004
39	JULY	NWNW	10	50N	75W	WYW-162026	WY0049999-010
40	FORTIFICATION	SENE	9	50N	75W	FEE	WY0049999-002
41	FORTIFY	NWNE	9	50N	75W	FEE	WY0049999-001

The following impoundments and their associated outfalls are proposed in Alternative B. They are not included in Alternative C. The outfall “Pending-032”, proposed below, was relocated in Alternative C to the Love 34-16-5075B.

	<b>Impoundment</b>	<b>Qtr/qtr</b>	<b>Sec</b>	<b>Twp</b>	<b>Rng</b>	<b>Lease</b>	<b>Outfall</b>
1	LOVE 31-09-5075	NWNE	9	50N	75W	FEE	PENDING-011
2	LOVE 34-04-5075	SWSE	4	50N	75W	FEE	PENDING-008
3	LOVE 44-16-5075	SESE	16	50N	75W	STATE	PENDING-032
4	LOVE 22-24-5075	SWSE	24	50N	75W	WYW5343	WY0054208-003

County: Campbell

Applicant: Williams Production RMT Company

Surface Owners: Love Land & Cattle Company

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

- Drilling of 48 total federal CBM wells in Big George and Gates-Wall coal zones to depths of approximately 1300 to 2100 feet.
- An unimproved and improved road network.
- A Water Management Plan (WMP) that involves the following infrastructure and strategy: 41 discharge points and 41 stock water reservoirs, six of which are existing and operating as part of a previous action or as a result of fee development in this area. All are within the Upper Powder River watershed.
- A buried gas, water and power line network, to existing central gathering/metering facilities and existing compression facilities.

For a detailed description of design features, construction practices, timelines 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 COAs 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**

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 I Add I POD are listed below under 2.3.1:

#### **2.3.1. Changes as a result of the on-sites**

1. To reduce disturbance in sage grouse habitat, mowing of sagebrush will be minimized to only what is necessary for rigging up and safety at the 34-24-5075 and the 23-23-5075 locations.
2. Due to the narrow running surface over dams on the Fortification Creek reservoirs, the access road and corridor in the NE quarter of Section 6 T50N R75N, through these reservoirs, was removed from the plan.
3. Instead of proposing a new access road, Williams decided to use an existing road to access the 14-4-5075 location.
4. Due to erosive soils the engineered road to the 12-5-5075 location will be stabilized.
5. To reduce surface disturbance Williams agreed to keep access to the 41-24-5075 location to the edge of the existing pipeline.
6. To reduce surface disturbance, Williams will attempt to reduce the 23-24-5075 constructed pad with engineered diaphragm down to a slotted pad. The engineered diaphragm will remain on file in case the reduction is found to be not workable during rig up and construction.
7. Williams agreed to remove the proposed road and pipeline between the 32-5-5075 and the 34-5-5075 locations to reduce surface disturbance.
8. Williams agreed to put a cattle guard and gate on the access road to the 12-24-5075.
9. Williams agreed to remove the road in the NE corner of section 23 to reduce surface disturbance.
10. To reduce new disturbance of the pipeline near the 23-23-5075 location, Williams will construct their pipeline near the existing Western Gas line. They will drive on the existing disturbance of Western Gas and reduce new disturbance to 10 feet.

11. Williams moved the 21-23-5075 location approximately 100' east to prevent a constructed pad and keep disturbance out of drainage.
12. To reduce surface disturbance, Williams changed the road from the 12-24-5075 to the 21-24-5075 location.
13. To prevent raptor nest abandonment and productivity loss, Williams dropped the 14-9-5075BG and the 14-9-5075GW, twin locations.
14. Williams added a spot upgrade to mitigate water down a drainage that crossed the access road to the 12-10-5075 location.
15. The following dams and their associated outfalls were dropped because of poor terrain/soil conditions which could lead to dam failure:
 

Love 34-04-5075 and outfall 008	Love 31-09-5075 and outfall 011
Love 44-16-5075 and outfall 032	Love 22-24-5075 and outfall 003
16. To balance the above dropped reservoirs the following dams and outfalls have been added:
 

Love 34-16-5075B and outfall 032
Love 21-22-5075 and outfall 035
17. The following dams were moved or their locations adjusted to incorporate downstream headcuts or to make better use of terrain features during construction:
 

Love 21-09-5075	Love 23-9-5075	Love 44-04-5075B
Love 21-16-5075	Love 33-15-5075B	
18. Outfall 016 to Love 24-10-5075 dam will be moved closer to the high water line of the proposed reservoir to reduce overland flow.
19. The following dams will require construction oversight during building because of the presence of sandstone, scoria, shale, saturated soil conditions and/or coal layers which, if not mitigated, could compromise a dam's structural integrity:
 

Love 21-08	Love 43-04	Love 11-10B	Love 44-09
Love 41-06	Love 43-09	Love 31-10	Love 11-15B
Love 11-15			

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

### **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**

1. In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004. For WYPDES permits received by DEQ after the August 1<sup>st</sup> effective date, the BLM will require that operators comply with the latest DEQ standards and monitoring guidance. WDEQ has also established a task force to evaluate the need for investigation of shallow groundwater aquifers under existing impoundments used for storage and disposal of CBNG produced water.

#### **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 CBM water on downstream irrigation use may require operators to increase the amount of storage of CBM 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.
  6. The operator will supply a copy of the complete approved WYPDES permits to BLM as they are issued by WDEQ.

#### **2.3.2.3. Soils**

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

#### **2.3.2.4. 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 locate facilities so that noise from the facilities at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.
3. 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.
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. 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.

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

#### **2.3.2.5.1. Bald Eagle**

1. The BLM will monitor all take of bald eagle habitat associated with the preferred alternative. The actual measurement of disturbed habitat is the responsibility of BLM but can be delegated to BLM' agent (consultant, contractor, etc.) A written summary will be provided to the USFWS' Wyoming Field Office semi-annually. The semi-annual report will include field survey reports for endangered, threatened, proposed and candidate species for all actions covered under the PRB FEIS and ROD. The semi-annual reports will include all actions completed up to 30 days prior to the reporting dates. The first report will be due 6 months after the signing of the ROD and on the anniversary date of the signing of the ROD. Reporting will continue for the life of the project.
2. The BLM will monitor all road-associated carcasses, jackrabbit sized and larger, along project (operator-maintained) roads.
3. Special habitats for raptors, including wintering bald eagles, will be identified and considered during the review of Sundry Notices.

#### **2.3.2.5.2. Black-footed Ferret**

1. Prairie dog colonies will be avoided wherever possible.

#### **2.3.2.5.3. Mountain Plover**

1. A disturbance-free buffer zone of 0.25 mile will be established around all mountain plover nesting locations between March 15 and July 31.
2. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plover will not be constructed within ¼ mile of known mountain plover nest sites.
3. Construction of ancillary facilities (for example, compressor stations, processing plants) will not be located within ½ mile of known nesting areas. The threats of vehicle collision to adult plovers and their broods will be minimized, especially within breeding aggregation areas.
4. Where possible, roads will be located outside of plover nesting areas.
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.

**2.3.2.5.4. Ute Ladies'-tresses Orchid**

1. Moist soils near wetlands, streams, lakes, or springs in the project area will be promptly revegetated if construction activities impact the vegetation in these areas. Revegetation will be designed to avoid the establishment of noxious weeds.

**2.3.2.6. 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.

**2.3.2.7. Noise**

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

**2.3.2.8. Air Quality**

1. During construction, emissions of particulate matter from well pad and resource road construction will be minimized by application of water, or other dust suppressants, with at least 50 percent control efficiency. Roads and well locations constructed on soils susceptible to wind erosion could be appropriately surfaced or otherwise stabilized to reduce the amount of fugitive dust generated by traffic or other activities, and dust inhibitors (surfacing materials, non-saline dust suppressants, and water) could be used as necessary on unpaved collector, local and resource roads that present a fugitive dust problem. The use of chemical dust suppressants on BLM surface will require prior approval from the BLM authorized officer.

**2.3.3. Site specific mitigation measures**

1. All changes made at the onsite (Page 9 Carr Draw I Additions I EA # –WY-070-07-071) will be followed. They have all been incorporated into the operator’s POD.

**Civil Engineering**

1. 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
12-16%	150 ft

2. 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.
3. Provide 4” of aggregate where grades exceed 8%.

**Reality**

1. Rights-of-Ways will be secured prior to construction of planned construction in:
  - T. 50 N., R. 75 W.
    - Section 6            Lot 15
  - T. 51 N., R. 75 W.
    - Sections 31        Lot 13
    - Section 32        Lots 9 and 16
    - Section 33        Lots 12 and 13
2. 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.

**Water Management**

1. The following dams were moved or adjusted to incorporate downstream headcuts or to make better use of terrain features during construction:
  - Love 21-09-5075            Love 23-9-5075            Love 44-04-5075B
  - Love 21-16-5075            Love 33-15-5075B
2. Outfall 016 will be moved to the high water line of the proposed Love 24-10-5075 reservoir.
3. The following dams will require construction oversight during building because of the presence of sandstone, scoria, shale, saturated soil conditions and/or coal layers which, if not mitigated, could compromise structural integrity:
  - Love 21-08                    Love 43-04                    Love 11-10B                    Love 44-09
  - Love 41-06                    Love 43-09                    Love 31-10                    Love 11-15B
  - Love 11-15

**Wildlife**

1. The following conditions will minimize the impacts to raptors:
  - a. No surface disturbing activity shall occur within ½ 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 timing limitation will affect the following

<i>Township/Range</i>	<i>Sec.</i>	<i>Affected Wells and Infrastructure</i>
50/75	8	<b>Well: 43-8-5075BG/GW</b> <b>Pits: None</b> <b>ALL project related activities within the south half of this section.</b>
50/75	9	<b>Wells: 23-9-5075BG/GW and 43-9-5075BG/GW</b> <b>Pits: Love 23-09-5075, Love 44-09-5075, and Love 44-09-5075</b> <b>ALL project related activities within this ENTIRE section except the Love 31-9-5075 pit.</b>
50/75	15	<b>Wells: None</b> <b>Pit: Love 11-15-5075 B</b> <b>ALL project related activities within the western quarter of this section.</b>
50/75	24	<b>Wells: 21-24-5075GW, 32-24-5075GW, and 41-24-5075GW</b> <b>Pit: Love 22-24 res</b> <b>ALL project related activities within the northern half and the eastern quarter of this section.</b>

- b. Surveys to document nest occupancy shall be conducted by a biologist following BLM protocol, between April 15 and June 30. All survey results shall be submitted in writing to a

Buffalo BLM biologist and approved prior to surface disturbing activities. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a ½ mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within ½ mile of occupied raptor nests from February 1 to July 31.

- c. Nest productivity checks shall be completed for 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. This applies to the following nest(s):

<b>BLM ID#</b>	<b>SPECIES</b>	<b>UTM</b>	<b>LEGAL LOCATION</b>	<b>SUBSTRATE</b>
3139	Great-horned owl	429913E 4906784N	NENE Sec. 16 T50N, R75W	Cottonwood, live
3141	Ferruginous hawk	435767E 4904744N	NESW Sec. 19 T50N, R74W	Rock outcrop
3140	Ferruginous hawk	435791E 4904600N	NESW Sec. 19 T50N, R74W	Rock outcrop
3142	Great-horned owl	429621E 4907907N	NWSE Sec. 9 T50N, R75W	Cottonwood, live
3143	Unknown	429279E 4907614N	SESW Sec. 9 T50N, R75W	Artificial Nest Structure
3144	Red-tailed hawk	434317E 4905797N	SESW Sec. 13 T50N, R75W	Cottonwood, live
3355	Unknown	427832E 4907483N	SESW Sec. 8 T50N, R75W	Willow
No BLM ID#	Red-tailed hawk	428836E 4907955N	NWSW Sec. 9 T50N, R75W	Cottonwood, live
No BLM ID#	Red-tailed hawk	428999E 4907677N	SWSW Sec. 9 T50N, R75W	Cottonwood, live
3485	Ferruginous hawk	435481E 4904724N	NWSW Sec. 19 T50N, R74W	Rock outcrop
3433	Red-tailed hawk	435792E 4905426N	SESW Sec. 19 T50N, R74W	Cottonwood, live
3567	Ferruginous hawk	435792E 4905426N	NENW Sec. 19 T50N, R74W	Rock outcrop
3426	Unknown	435559E 4906171N	SWSW Sec. 18 T50N, R74W	Cottonwood, live
3428	Unknown	435516E 4906225N	SWSW Sec. 18 T50N, R74W	Cottonwood, live
2086	Red-tailed hawk	433625E 4908240N	SESW Sec. 12 T50N, R75W	Cottonwood, live
3487	Great-horned owl	433068E 4909039N	SWSE Sec. 2 T50N, R75W	Cottonwood, live
3349	Red-tailed hawk	427223E 4911533N	SWNW Sec. 32 T51N, R75W	Juniper
2654	Unknown	426978E 4911353N	NWSE Sec. 31 T51N, R75W	Cottonwood, live

- d. 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.

- e. 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.
2. The following conditions will minimize the impacts to sage-grouse:
- a. No surface disturbing activities are permitted within 2 miles of a sage grouse lek between March 1 and June 15, prior to completion of a greater sage grouse lek survey. This condition will be implemented on an annual basis for the duration of surface disturbing activities. This timing limitation will affect the following:

<b>Township/Range</b>	<b>Sec.</b>	<b>Affected Wells and Infrastructure</b>
50/75	5	<b>Wells: 12-5-5075BG/GW, 23-5-5075BG/GW, and 32-5-5075BG/GW</b> <b>Pits: None</b> ALL project related activities within the <b>NW half</b> of this section.
50/75	6	<b>Well: 43-6-5075BG/GW</b> <b>Pits: None</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	8	<b>Well: 21-8-5075BG/GW</b> <b>Pit: Love 21-08-5075</b> ALL project related activities within this <b>ENTIRE</b> section
50/75	9	<b>Wells: 23-9-5075BG/GW and 43-9-5075BG/GW</b> <b>Pits: Love 23-09-5075, Love 43-09-5075, and Love 44-09-5075</b> ALL project related activities within the <b>south half</b> of this section.
50/75	10	<b>Well: 43-10-5075GW</b> <b>Pits: Love 14-10-5075, Love 22-10-5075, Love 24-10-5075 and Love 34-10-5075</b> ALL project related activities within the <b>south half</b> of this section.
50/75	11	<b>Wells: None</b> <b>Pits: None</b> ALL project related activities within the <b>SW quarter</b> of this section.
50/75	14	<b>Wells: None</b> <b>Pits: None</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	15	<b>Well: 32-15-5075GW</b> <b>Pits: Love 11-15-5075, Love 11-15-5075B, Love 33-15-5075, Love 33-15-5075B, Love 33-15-5075C, Love 33-15-5075D, and Love 43-15-5075</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	16	<b>Wells: None</b> <b>Pits: Love 21-16-5075, Love 22-16-5075, Love 34-16-5075, Love 41-16-5075, and Love 44-16-5075</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	17	<b>Wells: None</b> <b>Pits: None</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	21	<b>Wells: None</b> <b>Pits: Love 41-21-5075</b> ALL project related activities within this <b>ENTIRE</b> section.
50/75	22	<b>Wells: 12-22-5075GW/BG, 21-22-5075BG/GW, 41-22-5075GW, and 43-22-5075GW</b> <b>Pits: None</b> ALL project related activities within this <b>ENTIRE</b> section.

<b>Township/Range</b>	<b>Sec.</b>	<b>Affected Wells and Infrastructure</b>
50/75	23	<b>Wells: 12-23-5075GW, 21-23-5075GW, 23-23-5075GW, 41-23-5075GW</b> <b>Pit: Sheeppcamp</b> ALL project related activities within this <b>ENTIRE</b> section <i>except the 32-23-5075GW well and the Love 43-23 Res pit.</i>
50/75	24	<b>Wells: 12-24-5075GW, 21-24-5075GW, 23-24-5075GW, 32-24-5075GW, 34-24-5075GW, and 41-24-5075GW</b> <b>Pits: Love 22-24 Res and Sheeppcamp</b> ALL project related activities within this <b>ENTIRE</b> section <i>except the 14-24-5075GW well.</i>

- b. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and surface disturbing activities will not be permitted until after the nesting season. If surveys indicate that the identified lek is inactive during the current breeding season, surface disturbing activities may be permitted within the 2 mile buffer until the following breeding season (March 1). 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.
  - d. Well metering, maintenance and other site visits within 0.5 miles of documented sage grouse lek sites shall be minimized as much as possible during the breeding season (March 1– June 15), and restricted to between 0900 and 1500 hours.
  - e. The Companies will locate facilities so that noise from the facilities at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.
3. A mountain plover nesting survey is required in suitable habitat prior to commencement of surface disturbing activities in the following areas:

<b>Location</b>	<b>Size in acres</b>
N ½ Sec. 4, T50N, R75W	~80
NE ¼ Sec. 15, T50N, R75W	~40
SESE Sec. 23 and SWSW Sec. 24, T50N, R75W	~30
SESE Sec. 19, T50N, R75W	~1-5

If the survey is not conducted prior to commencement of surface disturbing activities, it shall be conducted during the first breeding season following POD approval. No surface disturbing activities are permitted in the suitable habitat area listed above, from March 15-July 31, unless a mountain plover nesting survey has been conducted during the current breeding season.

- 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 surface disturbing activities.
- b. If a mountain plover nest is identified, then a seasonal disturbance-free buffer of ¼ mile shall be maintained between March 15 and July 31. If no mountain plover nests are identified, then surface disturbing activities may be permitted within suitable habitat until the following breeding season (March 15).
- c. No surface disturbing activity shall occur within 0.25 miles of all identified prairie dog towns from February 1 through July 31, annually, prior to a burrowing owl nest occupancy survey for the current breeding season. A 0.25 mile buffer will be applied if a burrowing owl nest is

identified. This condition will be implemented on an annual basis for the duration of surface disturbing activities within the following prairie dog town(s):

Location	Size in acres
N ½ Sec. 4, T50N, R75W	~80
NE ¼ Sec. 15, T50N, R75W	~40
SESE Sec. 23 and SWSW Sec. 24, T50N, R75W	~30
SESE Sec. 19, T50N, R75W	~1-5

**Surface Use**

- 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:

**Sandy Ecological Site Seed Mix (23-24-5075, 32-24-5075, 34-24-5075, and 41-24-5075 well locations)**

Species	% in Mix	Lbs PLS*
<i>Thickspike Wheatgrass</i> (Elymus lanceolatus ssp. lanceolatus)	20	2.4
<i>Prairie sandreed</i> (Calamovilfa longifolia)	30	3.6
<i>Indian ricegrass</i> (Achnatherum hymenoides)	20	2.4
<i>Needleandthread</i> (Hesperostipa comata ssp. comata)	15	1.8
<i>Prairie coneflower</i> (Ratibida columnifera)	5	0.6
<i>White or purple prairie clover</i> (Dalea candidum, purpureum)	5	0.6
<i>Scarlet Globemallow</i> (Sphaeralcea coccinea) / or <i>Blue flax</i> (Linum lewisii)	5	0.6
<b>Totals</b>	<b>100%</b>	<b>12 lbs/acre</b>

**Loamy Ecological Site Seed Mix (all other well 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

<b>Species</b>	<b>% in Mix</b>	<b>Lbs PLS*</b>
<i>White or purple prairie clover</i> ( <i>Dalea candidum</i> , <i>purpureum</i> )	5	0.6
<i>Rocky Mountain beeplant</i> ( <i>Cleome serrulata</i> ) /or <i>American vetch</i> ( <i>Vicia americana</i> )	5	0.6
<b>Totals</b>	<b>100%</b>	<b>12 lbs/acre</b>

2. 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 I Additions I POD is Carlsbad Canyon, 2.5Y 6/2.
3. To reduce disturbance in sage grouse habitat, mowing of sagebrush will be minimized to only what is necessary for rigging up and safety at the 34-24-5075 and the 23-23-5075 locations.
4. Due erosive soils the engineered road to the 12-5-5075 location will be stabilized.
5. Please contact Jennifer Spagon Natural Resource Specialist, @ (307) 684-5820, Bureau of Land Management, Buffalo, if there are any questions concerning these surface use COAs.

#### **2.4. Alternatives considered but not analyzed in detail**

The operator did not document consideration of alternative water management strategies in this plan of development.

### **3. DESCRIPTION OF AFFECTED ENVIRONMENT**

Applications to drill were received on July 21, 2006. Field inspections of the proposed Carr Draw I Add I CBM project were conducted by the following participants on 12/12/2006, 12/13/2006 and 02/06/2007

December 12, 2006

Duane Joslyn, Operation Supervisor, Williams Production RMT  
Rex Lynde, Drilling, Williams Production RMT  
Ralph Demel, Construction Forman, Western Land Services  
Ranee Jaspersen, Land Manager, Williams Production RMT  
Patrick Barker, Project Manager, Western Land Services  
Allen Aksamit, Wildlife Biologist, Western Land Services  
Allen Jones, Hydrologist, Western Land Services  
Todd Merchen, Lowham Engineering  
Jason Weston, Archeologist  
BJ Earle, Archeologist, BLM  
Ben Adams, Hydrologist, BLM  
Jennifer Morton, Wildlife Biologist, BLM  
Lee Harrelson, Civil Engineer, BLM  
Jennifer Spagon, Natural Resource Specialist, BLM

December 13, 2006 (same as above and in addition to)

Christy Love, Love Land and Cattle Company, Surface Owner  
Dave Belus, Grazing Lessee

February 6, 2007

Allen Jones, Hydrologist, Western Land Services  
Ben Adams, Hydrologist, BLM  
Jennifer Spagon, Natural Resource Specialist, 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.**

<b>Mandatory Item</b>	<b>Potentially Impacted</b>	<b>No Impact</b>	<b>Not Present On Site</b>	<b>BLM Evaluator</b>
Threatened and Endangered Species	X			Jennifer Morton
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			BJ Earle
Prime or Unique Farmlands			X	Jennifer Spegon
Wild & Scenic Rivers			X	Jennifer Spegon
Wetland/Riparian	X			Ben Adams
Native American Religious Concerns			X	BJ Earle
Hazardous Wastes or Solids			X	Jennifer Spegon
Invasive, Nonnative Species	X			Jennifer Spegon
Environmental Justice			X	Jennifer Spegon

The area of the Carr Draw I Additions I POD is federal and private surface overlying predominantly federal minerals. Current land uses within the project area include cattle grazing and CBNG development. The Carr Draw I Additions I POD is bounded on all sides by CBNG development; on the south by Williams' Carr Draw 2 and Williams' Carr Draw 2 Addition 2 PODs, on the west by both Williams' Carr Draw V Addition 1 and Williams' Carr Draw V Addition IIA PODS, to the north is Lance Oil and Gas Company's Camp John PODs, to the northeast is Petro-Canada's Montgomery Draw and to the east is Emerald's KFC PODs and Petro-Canada's Love Federal POD. The leases in Williams' Carr Draw I Additions I POD border the leases in the Yates' proposed Lottery POD. Where this occurs, the Yates Lottery POD project boundaries overlap Williams Carr Draw I Additions I POD boundaries and the two operators share some existing roads and infrastructure.

### **3.1. Topographic Characteristics of Project Area**

The Carr Draw I Additions I POD is located approximately 20 miles west of Gillette, WY in Campbell County, Township 50 and 51 North, Range 75 West, Sections 3-6, 8-11, 14-17, and 21-25, Sixth Principal Meridian.

Elevations in the Carr Draw I Additions I POD area range from 4400 to 4800 feet above sea level. The topography within the project consists of approximately 50% rough to moderately rough terrain with numerous ridges and deep draws. The remaining 50% consists of rolling hills and flats cut by steep to moderately steep draws (Martini and Aksamit 2006). The project area is drained by Fortification Creek and the Sand Draw tributary of Wild Horse Creek, which are tributaries to the Powder River (WLS 2006).

### **3.2. Vegetation & Soils**

To determine the appropriate Ecological Sites for this proposed action, BLM specialists analyzed and field verified data from the U.S. Department of Agriculture (USDA) Natural Resources Conservation

Service (NRCS) published soil survey soils information. The Technical guides are the primary scientific references for the NRCS. They contain technical information about the conservation of soil, water, air, and related plant and animal resources. Technical guides used are localized so that they apply specifically to the geographic area for which they are prepared. Technical Guides were used for determining soils information for each Ecological site and further determine resource identification and management recommendations.

Mixed Sagebrush Grass Plant Community is the dominant vegetative community in the Carr Draw I Additions I project area. Common species associated with this vegetation type include Wyoming big sagebrush (*Artemisia tridentata wyomingensis*), 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).

Specific species observed throughout the Carr Draw I Additions I project area include Wyoming big sagebrush, silver sagebrush, western wheatgrass, green needlegrass, blue grama, and prairie junegrass. Differences in dominant species within the project area vary with soil type, aspect and topography.

### **Soil**

The NRCS Technical Guides were used to identify the precipitation zone, to analyze soils and analyze vegetation for this project. Four well locations in the project, 23-24-5075, 32-24-5075, 34-24-5075, and 41-24-5075, overlay sandy soils, while the remainder of the locations in the project overlay loamy soils. Soil character differs with topographic location, slope and elevation. Topsoil depths vary from fractions of an inch, to a few inches on ridges, and up to 8-10 inches in bottomland. Erosion potential varies from slight to severe depending on the soil type, vegetative cover and slope. Reclamation potential of soils also varies throughout the project area depending on topography, vegetation cover and soil type.

### **Plant Community**

The Ecological Site descriptions, combined with field verifications, determined the four sites with sandy soils as supporting a Needleandthread Plant Community. The loamy soil sites were classified as a Loamy Mixed Sagebrush Grass Plant Community by the NRCS, commonly termed, sagebrush shrubland and mixed-grass prairie. Field observations verified the primary habitat, sagebrush shrubland and mixed-grass prairie, dominated by Wyoming big sagebrush.

### **Needle and thread Plant Community**

The Needle and thread plant community, found in the areas sandy soils, is the result of moderate to long season grazing. The understory of grass includes needleandthread, threadleaf sedge, and prairie junegrass. Fringed sagewort has increased. When compared to the Historic Climax Plant Community, prairie sandreed and Indian ricegrass have decreased. Threadleaf sedge, needleandthread and fringed sagewort have increased. This community is suited to grazing by both domestic livestock and wildlife, during the spring, summer and fall (NRCS 2001).

### **Mixed Sagebrush Grass Plant Community**

The Mixed Sagebrush Grass Plant is the primary vegetation type. Within this vegetation type Wyoming big sagebrush is a significant component of this plant community. Sagebrush crown cover varies with a variety of understory grasses and forbs. 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 (NRCS 2001).

#### **3.2.1. Wetlands/Riparian**

Under natural conditions, the project area would have no perennial wetland or riparian areas. A few scattered cottonwood trees occur in draws within the project area as accidental individuals (WLS 2006). Cottonwood stands begin to occur a few miles upstream of Fortification Creek's confluence with the Powder River, well below the project boundary.

### **3.2.2. Invasive Species**

Prickly pear cactus, cheat grass/Japanese brome (*Bromus japonicus*) and thistle were noted during field sites. The type of thistle was not identified. No other invasive plant infestations were discovered by a search of inventory maps and/or databases provided by the University of Wyoming or during subsequent field investigations by the proposed project proponent.

### **3.3. Wildlife**

A few scattered cottonwood trees occur in draws within the project area. The primary habitat is sagebrush grassland, dominated by Wyoming big sagebrush. Sagebrush communities occur throughout the project area. Current land uses within the project area include livestock grazing and oil and gas development.

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

A habitat assessment and wildlife inventory surveys were performed by Western Land Services (WLS). WLS performed surveys for bald eagles, mountain plover, sharp-tailed grouse, greater sage-grouse, raptor nests and prairie dog colonies according to protocol in 2006. No formal surveys were conducted for Ute ladies'-tresses orchid, although a habitat assessment was conducted in 2006.

A BLM Biologist conducted a field visit on December 12 and 13, 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 expected to be within the Carr Draw I addition 1 project area include pronghorn antelope and mule deer. The project area is part of the Gillette pronghorn antelope herd unit. The 2004 estimated herd population was 13,985 with a population objective of 11,000 (WGFD 2004). Mule deer belong to the Powder River herd unit. Mule deer populations have been increasing since 1998 with a 2004 population estimate of 55,561 animals, and a herd objective of 52,000 (WGFD 2004). Populations of pronghorn antelope and mule deer within their respective hunt areas are above WGFD objectives.

The WGFD has designated the northern-most portion of the project area as winter range, the southern-most portion of the project area as winter-yearlong range and the remainder of the project area as yearlong range for pronghorn antelope. The eastern half project area is designated as yearlong range and the western half of the project area is designated as winter-yearlong range for mule deer.

**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. **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.

Although no part of the project area is designated range for elk, six elk were observed by WLS in SWSW Section 6, T50N, R75W on January 26, 2006. No collared elk locations have been documented within the project area. Designated yearlong range for the Fortification elk herd unit is located approximately 1.5 miles west of this location and 1.0 mile from project activities associated with this project.

### 3.3.2. Aquatics

The project area is drained by Fortification Creek and the Sand Draw tributary of Wild Horse Creek, which are ephemeral tributaries to the Powder River (WLS 2006). No springs are present within the project area (WLS WMP 2006). Fish that have been identified in the Powder River watershed are listed in the PRB FEIS (3-156-159).

### 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

Eighteen raptor nest sites were identified by WLS within 0.5 mile of the project area, four of which were active in 2006 (Table 4.).

**Table 4.** Documented raptor nests within the Carr Draw 1 Addition 1 project area in 2006.

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS IN 2006
3139	Great-horned owl	429913E 4906784N	NENE Sec. 16 T50N, R75W	Cottonwood, live	Excellent	Unknown
3141	Ferruginous hawk	435767E 4904744N	NESW Sec. 19 T50N, R74W	Rock outcrop	Excellent	Unknown
3140	Ferruginous hawk	435791E 4904600N	NESW Sec. 19 T50N, R74W	Rock outcrop	Excellent	Unknown
3142	Great-horned owl	429621E 4907907N	NWSE Sec. 9 T50N, R75W	Cottonwood, live	Excellent	Active
3143	Unknown	429279E 4907614N	SESW Sec. 9 T50N, R75W	Artificial Nest Structure	Fair	Inactive
3144	Red-tailed hawk	434317E 4905797N	SESW Sec. 13 T50N, R75W	Cottonwood, live	Excellent	Active
3355	Unknown	427832E 4907483N	SESW Sec. 8 T50N, R75W	Willow	Poor	Inactive
No BLM ID#	Red-tailed hawk	428836E 4907955N	NWSW Sec. 9 T50N, R75W	Cottonwood, live	Excellent	Active
No BLM ID#	Red-tailed hawk	428999E 4907677N	SWSW Sec. 9 T50N, R75W	Cottonwood, live	Excellent	Inactive
3485	Ferruginous	435481E	NWSW Sec. 19	Rock outcrop	Fair	Inactive

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS IN 2006
	hawk	4904724N	T50N, R74W			
3433	Red-tailed hawk	435792E 4905426N	SEnw Sec. 19 T50N, R74W	Cottonwood, live	Good	Active
3567	Ferruginous hawk	435792E 4905426N	NENw Sec. 19 T50N, R74W	Rock outcrop	Fair	Inactive
3426	Unknown	435559E 4906171N	SWSw Sec. 18 T50N, R74W	Cottonwood, live	Poor	Inactive
3428	Unknown	435516E 4906225N	SWSw Sec. 18 T50N, R74W	Cottonwood, live	Fair	Inactive
2086	Red-tailed hawk	433625E 4908240N	SEnw Sec. 12 T50N, R75W	Cottonwood, live	Good	Unknown
3487	Great-horned owl	433068E 4909039N	SWSE Sec. 2 T50N, R75W	Cottonwood, live	Fair	Unknown
3349	Red-tailed hawk	427223E 4911533N	SWNW Sec. 32 T51N, R75W	Juniper	Good	Inactive
2654	Unknown	426978E 4911353N	NWSE Sec. 31 T51N, R75W	Cottonwood, live	Good	Inactive

### 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).

Four black-tailed prairie dog colonies were identified during site visits by WLS partially or wholly within the project area. Seven additional towns are located within 1.5km of those colonies. The project area is located approximately 7 miles southeast of the Arvada potential reintroduction site.

**Table 3. Black-tailed prairie dog colonies identified during site visits by WLS within the project area or within 1.5km of those colonies, totaling 396 acres.**

Location	Approximate size in acres	Status
N ½ Sec. 4, T50N, R75W	80	~15 active acres
NE ¼ Sec. 15, T50N, R75W	40	active
SESE Sec. 23 and SWSW Sec. 24 T50N, R75W	30	~5-10 active acres
SESE Sec. 19, T50N, R75W	1-5	Active
W ½ Sec. 30, T50N, R74W	144	Active
NE ¼ Sec. 26, T50N, R75W	37	Active
NWNW Sec. 19, T50N, R74W	7	Active
NE ¼ Sec. 31, T50N, R74W	38	Active
SWNE Sec. 6, T49N, R74W	6	Active
NNW Sec. 7, T49N, R74W	4	Active
NESW Sec. 7, T49N, R74W	5	Active

#### **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. A decision is expected in June.

Bald eagle nesting habitat is generally found in 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. Power poles provide attractive perch sites in areas where mature trees and other natural perches are lacking, such as the Carr Draw 1 Addition 1 project area.

The Carr Draw 1 Addition 1 project has few mature trees associated with it. A few scattered cottonwood trees occur in draws within the project area. No potential nests, suitable nesting habitat, or suitable winter roosting habitat were identified during consultants (WLS) or BLM biologist’s site visits, within the immediate project area or extending one mile from proposed activities.

#### **3.3.5.1.3. Ute 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 (Heidel pers. Comm.). The new locations were in the same drainages as the original populations, with two on the same tributary and within a few miles of an original location. Drainages with documented orchid populations include Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County.

The project area is drained by Fortification Creek and the Sand Draw tributary of Wild Horse Creek, which are tributaries to the Powder River (WLS 2006). WLS conducted surveys to identify potential habitat. No springs or other potential habitat are present. No Ute ladies'-tresses habitat was identified within or surrounding 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.

Four black-tailed prairie dog colonies were identified during site visits by WLS partially or wholly within the project area (Table 3).

**Table 3. Black-tailed prairie dog colonies identified during site visits by WLS within the project area, totaling 155 acres.**

Location	Approximate size in acres	Status
N ½ Sec. 4, T50N, R75W	80	~15 active acres
NE ¼ Sec. 15, T50N, R75W	40	active
SESE Sec. 23 and SWSW Sec. 24 T50N, R75W	30	~5-10 active acres
SESE Sec. 19, T50N, R75W	1-5	Active

**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).

Suitable sage-grouse habitat is present throughout the project area. Five documented sage-grouse leks are present within two miles of the project area (Table 6). Sage-grouse were observed by WLS on four of these leks in 2006.

**Table 6.** Documented sage-grouse leks within two miles of the Carr Draw 1 Additions 1 projects in 2006.

<b>Lek ID</b>	<b>UTM NAD83</b>	<b>Legal Location</b>	<b>Status (Peak Males) in 2006</b>	<b>Distance From Project Area (Miles)</b>
Hayden I	427859E 4905539N	NENW Sec. 17 T50N, R75W	26	0.99
Hayden Sat. A	431300E 4905100N	SWNE Sec. 22 T50N, R75W	0	0.0
Hayden Sat. B	431273E 4903436N	SWNW Sec. 22 T50N, R75W	68	0.95
Hayden II	426209E 4911666N	SWNE Sec. 31 T51N, R75W	2	0.77
Watsabaugh I	434181E 4902342N	SWSE Sec. 36 T50N, R75W	34	1.09

### 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.

Mountain plover breeding and nesting habitat exists throughout the project area within the prairie dog colonies. Surveys for mountain plover occupancy according to Service protocol were conducted during 2006 (WLS) nesting seasons. No mountain plovers were observed.

### 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 is 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](http://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**

<b>Year</b>	<b>Total WY Human Cases</b>	<b>Human Cases PRB</b>	<b>Veterinary Cases PRB</b>	<b>Bird Cases PRB</b>
2001	0	0	0	0
2002	2	0	15	3
2003	392	85	46	25
2004	10	3	3	5
2005	12	4	6	3
2006	65	0	2	2

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, specifically, in the headwater tributaries of Fortification Creek and along Fortification Creek proper. A small portion of the project area drains to Sand Draw, which is a tributary to Wild Horse Creek, which flows into the Powder River near Arvada. Under natural conditions, Fortification Creek, Horse Creek, and all their tributaries within the project area are ephemeral. The upper reaches near the hydrologic divides are relatively flat, grading rapidly to gully systems with steep side slopes and fairly flat, broad bottoms. Typically, the broad-bottomed swales are well vegetated with brush, in various stages of senescence, and grasses. Well defined channels in the bottoms of these swales are normally absent, except in short reaches. Water which runs through these draws normally occurs from high intensity short duration rain events which produce a narrow spike for a hydrograph with rapidly rising and falling limbs. While peak flow during these events can be quite high, the total volume of water produced is often not very great.

#### **3.5.1. Groundwater**

Wyoming Department of Environmental Quality (WDEQ) water quality parameters for groundwater classifications (Chapter 8 – Quality Standards for Wyoming Groundwater) define the following limits for Total Dissolved Solids (TDS) and the classes of groundwater; 500 mg/l TDS for drinking water (Class I), 2000 mg/l for Agricultural Use (Class II) and 5000 mg/l for Livestock Use (Class III).

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

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

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

The BLM installed shallow groundwater monitoring wells at five impoundment locations throughout the PRB to assess ground-water quality changes due to infiltration of CBNG produced water. The most intensively monitored site had a battery of nineteen wells which were installed and monitored jointly by the BLM and USGS starting in August of 2003. Water quality data has been sampled from these wells on

a regular basis. That impoundment site, which has since been reclaimed, lies atop approximately 30 feet of unconsolidated deposits (silts and sands) which overlie non-uniform bedrock on a side ephemeral tributary to Beaver Creek and is approximately one and one-half miles from the Powder River. Baseline investigations showed water in two sand zones, the first was at a depth of 55 feet and the second was at a depth of 110 feet. The two water bearing zones were separated by a fifty-foot thick shale layer. The water quality of the two water bearing zones fell in the WDEQ Class III and Class I classifications respectively. Preliminary results from this sampling indicated increasing levels of TDS and other inorganic constituents over a six month period resulting in changes from the initial WDEQ classifications.

Preliminary data are showing increasing TDS levels as water infiltrates at two out of four other impoundment locations.

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 12 registered stock and domestic water wells within the POD boundary with depths ranging from 33 to 1010 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 within the Fortification Creek drainage which is a tributary to the Upper Powder River. Under natural conditions, all of the drainages in the area are ephemeral (flowing only in response to a precipitation event or snow melt – PRB FEIS Chapter 9 Glossary). The channels are fairly well vegetated with brush in various stages of senescence and grass. These swales have occasional places where small, defined low flow channels occur. However, most of the gully bottoms are fairly uniform broad-bottomed swales.

The PRB FEIS presents the historic mean Electrical Conductivity (EC, in  $\mu\text{mhos/cm}$ ) and Sodium Adsorption Ratio (SAR) by watershed at selected United States Geological Survey (USGS) Gauging Stations in Table 3-11 (PRB FEIS page 3-49). These water quality parameters "...illustrate the variability in ambient EC and SAR in streams within the Project Area. The representative stream water quality is used in the impact analysis presented in Chapter 4 as the baseline for evaluating potential impacts to water quality and existing uses from future discharges of CBM produced water of varying chemical composition to surface drainages within the Project Area" (PRB FEIS page 3-48). For the Upper Powder River, the EC ranges from 1797  $\mu\text{mhos/cm}$  at Maximum monthly flow to 3400  $\mu\text{mhos/cm}$  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 found within  $\frac{1}{2}$  mile of the POD's boundary.

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 and Paleontological Resources

Class III cultural resource inventories were conducted for the Carr Draw I Add I project prior to on-the-ground review and project design. A Class III inventory, BFO No.70060258, with amendments, summarized and updated the inventory situation within the POD boundary, previously considered under #70050161 (reviewed by SHPO 7/26/2005 (#0705MDB013)). Western Lands Services conducted both inventories. #70060258 was submitted to SHPO on 1/23/2007, under the “Notify and proceed” procedure of the State protocol.

A total of 6527 acres was inventoried for the project, and 3 sites and 28 isolated finds were located in the POD boundaries. Impacts will occur or already have affected 48 CA 1716 and 5916, but neither site is recommended as eligible to the National Register of Historic Places. No eligible sites were identified in the inventory, and cultural clearance is recommended.

The project area is mapped as Tertiary Wasatch, with a Paleontological sensitivity rating of 5, a high ranking. No Paleontological localities are reported in the area, probably due to lack of research. Medium sized to micro-mammals, turtles and crocodiles, and other reptiles constitute the principal Paleontological finds in this formation. No resources of interest to Native American cultural groups or Traditional Cultural Properties are known to occur in the project area.

**Table 3.5 Cultural Resources Inventory Results**

Site Number	Site Type	Eligibility
48 CA 1716	Historic homestead	Not eligible
48 CA 5915	Prehistoric lithic scatter	Not eligible
48 CA 5916	Historic and prehistoric site	Not eligible
NA	28 Isolated finds	Not eligible

## 4. ENVIRONMENTAL CONSEQUENCES

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

Based on the operator’s plans and BLM applied mitigation overall impacts to vegetation and soils from surface disturbance will be reduced. Of the 48 proposed wells 30 wells are twins with 2 wells per location and 18 are single wells per location, for a total of 33 locations. Out of the 33 locations, 21 locations can be drilled without a well pad being constructed and 12 locations will require constructed (cut & fill) well pads. As such, reduced surface disturbance would occur with the drilling of the 21 locations, which is the majority of the 33 locations. Disturbance will involve digging-out of rig wheel wells (for leveling drill rig on minor slopes) and reserve pit construction (estimated approximate size of 42 x 42 feet).

The short term disturbance area, the compaction of approximately 180 x 120 feet for laying down the rig and other drilling activities associated with driving and parking at the drill site, will be larger than the long term disturbance area. The short term disturbance associated with drilling activities will be reclaimed at soon as practicable. Reclamation properly begins as soon as the drilling operation ends. Typically

interim reclamation of that portion of the site that is no longer needed once a producing well is established.

Long term disturbance involves removing topsoil, re-spreading topsoil and reclamation of vegetation. The estimated long term disturbance, associated with the 21 well locations that do not need constructed well pads, would involve approximately 0.1 acre/location for a total of 2.1 acres. The other 12 well locations require pad construction, cutting and filling to level the pad for a drilling rig. Each of these would disturb approximately .75 acres/location for a total of 9 acres. The total estimated disturbance for all 48 wells would be 11.1 acres. This impact would be minimized with expedient, successful reclamation and site-stabilization, as committed to by the operator in the Carr Draw I Additions I POD MSUP and as required by BLM in COAs.

Existing improved roads of approximately 11.4 miles provide access to various two-tracks leading to the well sites. Approximately 22 miles of new and existing two-track trails would be utilized to access well sites. The majority of proposed pipelines (gas and water) have been located in “disturbance corridors.” Disturbance corridors involve the combining of 2 or more utility lines (water, gas, power) in a common trench, usually along access routes. This practice results in less surface disturbance and overall environmental impacts. Approximately 3 miles of pipeline would be constructed outside of corridors. Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, etc.) would ensure land productivity/stability is regained and maximized.

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

The PRB FEIS made predictions regarding the potential impact of produced water to the various soil types found throughout the Basin, in addition to physical disturbance effects. “Government soil experts state that SAR values of 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	21	0.1/acre	2.1	Long Term
Constructed Pad	12	or Site Specific	9	
Gather/Metering Facilities	0	Site Specific	0	Long Term
Screw Compressors	0	Site Specific	0	Long Term
Monitor Wells	0	0.1/acre	0	Long Term
Impoundments				Long Term
On-channel	35	Site Specific	675.0	
Off-channel	0	Site Specific	0.0	
Water Discharge Points	35	Site Specific or 0.01 ac/WDP	0.64	
Channel Disturbance				

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of 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	15.44		73.42	Long Term
No Corridor	.46	14' Width	0.79	
With Corridor	14.98	40' Width	72.63	
Pipelines	18.63		90.3	Short Term
No Corridor	2.97	40' Width	14.4	
With Corridor	15.66	40' Width	75.9	
Buried Power Cable		12' Width or Site Specific		Short Term
No Corridor	0		0	
Overhead Powerlines	3.1	15' Width	0.47	Long Term
Additional Disturbance	0	Site Specific	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

There are no natural wetland/riparian areas within or immediately downstream of this POD’s boundary. However, discharge and storage of CBNG produced water in Fortification Creek’s upper reaches is gradually creating wetlands associated with the impoundments and the seepage from these impoundments. As development continues and additional dams and reservoirs are constructed, Fortification Creek will develop extensive wetland and riparian areas as seepage increases and the Fortification Creek channel becomes saturated farther and farther downstream. This increase in wetland and riparian areas will bring the problems associated with intermittent to perennial streams such as flooded draw bottoms, changes in vegetation to species less palatable to livestock and big game, and severe icing during the winter months.

#### 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 present opportunities for weed invasion and spread. Produced CBNG water would continue to modify existing soil moisture and soil chemistry regimes in the areas of water release and storage. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, Canada thistle and perennial pepperweed. However, the operator’s Integrated Pest Management Plan along with mitigation as required by BLM applied COAs will ensure that potential impacts from noxious weeds and invasive plants will be minimal. The IPMP for the Carr Draw I Additions I POD 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 Fortification Creek and to construct additional reservoirs, if necessary, to prevent significant volumes of water from flowing into the Upper Powder River Watershed.
- The WMP for the Carr Draw I Add I 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 environmentally preferred alternative, winter range, winter-yearlong range and yearlong range for pronghorn antelope and yearlong range and winter-yearlong range for mule deer would be directly disturbed with the construction of wells, reservoirs, pipelines and roads. Table 4.1 summarized the proposed activities; items identified as long term disturbance would be direct habitat loss. Short-term disturbances also result in direct habitat loss; however, they should provide some habitat value as these areas are reclaimed and native vegetation becomes established.

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

Big game animals are expected to return to the project area following construction; however, populations will likely be lower than prior to project implementation as the human activities associated with operation and maintenance continue to displace big game. Mule deer are more sensitive to operation and maintenance activities than pronghorn, and as the Pinedale Anticline study suggests mule deer do not readily habituate. A study in North Dakota stated “Although the population (mule deer) had over seven years to habituate to oil and gas activities, avoidance of roads and facilities was determined to be long

term and chronic” (Lustig 2003). Deer have even been documented to avoid dirt roads that were used only by 4-wheel drive vehicles, trail bikes, and hikers (Jalkotzy et al. 1997).

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

The current Fortification elk herd is over the WGFD objective of 150, by 80 elk. The Fortification elk herd has exhibited a downward trend since 2002 and drought conditions continue to persist within the Powder River Basin. Hunting, both legally and illegally, of elk in the Fortification herd will also continue to decrease the population.

#### **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**

Effluent from the 63 Federal and Fee wells proposed in this plan will be combined with that of the 91 Federal and Fee wells already approved (9 Carr Draw 1 and 82 Carr Draw Unit Fee) to discharge at six existing outfalls reviewed during the Carr Draw 1 process and the 37 proposed outfalls outlined under this proposal (WLS 2006). If a reservoir were to discharge, it is unlikely produced water would reach a fish-bearing stream. Downstream species should not be affected.

#### **4.2.2.1. 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 4-247. No additional mitigation measures are required.

#### **4.2.3. Migratory Birds Direct and Indirect Effects**

Disturbance of the habitat types within the project area is likely to impact migratory birds. Native habitats are being lost directly with the construction of wells, roads, and pipelines. Prompt re-vegetation of short-term disturbance areas should reduce habitat loss impacts. Human activities likely displace migratory birds farther than simply the physical habitat disturbance. Drilling and construction noise can be troublesome for songbirds by interfering with the males’ ability to attract mates and defend territory, and the ability to recognize calls from conspecifics (BLM 2003).

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

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).

Overhead power lines may affect migratory birds in several ways. Power poles provide raptors with perch sites and may increase predation on migratory birds. Power lines placed in flight corridors may

result in collision mortalities. Some species may avoid suitable habitat near power lines in an effort to avoid predation. Additional direct and indirect effects to migratory birds are discussed in the PRB FEIS (4-231-235).

**4.2.3.1. Cumulative effects**

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

**4.2.4. Raptors Direct and Indirect Effects**

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

**Table 5.** Wells within close proximity to documented raptor nests within the Carr Draw I Addition 1 project area (Timing limitations will apply to these wells).

<b>BLM ID#</b>	<b>UTM (NAD 83)</b>	<b>SPECIES</b>	<b>STATUS</b>	<b>WELL / PIT NUMBER</b>	<b>DISTANCE (MILES)</b>
No BLM ID#	428999E 4907677N	Red-tailed hawk	Inactive	Well: 43-8-5075BG/GW	0.19 - out of line-of-sight
No BLM ID#	428999E 4907677N	Red-tailed hawk	Inactive	Well: 23-9-5075BG/GW	0.28
No BLM ID#	428999E 4907677N	Red-tailed hawk	Inactive	Well: 14-9-5075BG/GW	0.10 (removed from project)
No BLM ID#	428999E 4907677N	Red-tailed hawk	Inactive	Pit: Love 23-09-5075	0.26
No BLM ID#	428999E 4907677N	Red-tailed hawk	Inactive	Pit: Love 21-16-5075	0.49
No BLM ID#	428836E 4907955N	Red-tailed hawk	Active	Well: 43-8-5075BG/GW	0.20 – existing overhead power next to location
No BLM ID#	428836E 4907955N	Red-tailed hawk	Active	Well: 23-9-5075BG/GW	0.26
No BLM ID#	428836E 4907955N	Red-tailed hawk	Active	Well: 14-9-5075BG/GW	0.25
No BLM ID#	428836E 4907955N	Red-tailed hawk	Active	Pit: Love 23-09-5075	0.21 - out of line-of-sight
3142	429621E 4907907N	Great-horned owl	Active	Well: 23-9-5075BG/GW	0.23 – out of line-of-sight
3142	429621E 4907907N	Great-horned owl	Active	Pit: Love 23-09-5075	0.26
3142	429621E 4907907N	Great-horned owl	Active	Pit: Love 44-09-5075	0.36
3142	429621E 4907907N	Great-horned owl	Active	Pit: Love 43-09-5075	0.36
3143	429279E	Unknown	Inactive	Well: 23-9-5075BG/GW	0.22 – out of

BLM ID#	UTM (NAD 83)	SPECIES	STATUS	WELL / PIT NUMBER	DISTANCE (MILES)
	4907614N				line-of-sight
3143	429279E 4907614N	Unknown	Inactive	Well: 14-9-5075BG/GW	0.25
3143	429279E 4907614N	Unknown	Inactive	Pit: Love 23-09-5075	0.15 – out of line-of-sight
3143	429279E 4907614N	Unknown	Inactive	Pit: Love 21-16-5075	0.34
3139	429913E 4906784N	Great-horned owl	Unknown	Pit: Love 21-16-5075	0.30
3139	429913E 4906784N	Great-horned owl	Unknown	Pit: Love 22-16-5075	0.24
3139	429913E 4906784N	Great-horned owl	Unknown	Pit: Love 41-16-5075	0.07 – out of line-of-sight
3139	429913E 4906784N	Great-horned owl	Unknown	Pit: Love 44-09-5075	0.33
3139	429913E 4906784N	Great-horned owl	Unknown	Pit: Love 11-15-5075	0.38
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 21-16-5075	0.38
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 22-16-5075	0.27
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 41-16-5075	0.17 – out of line-of-sight
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 44-09-5075	0.45
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 11-15-5075	0.41
2083	429956E 4906569N	Great-horned owl	Unknown	Pit: Love 34-16-5075	0.39
3144	434317E 4905797N	Red-tailed hawk	Active	Well: 21-24-5075GW	0.22
3144	434317E 4905797N	Red-tailed hawk	Active	Well: 32-24-5075GW	0.40
3144	434317E 4905797N	Red-tailed hawk	Active	Well: 41-24-5075GW	0.46
3144	434317E 4905797N	Red-tailed hawk	Active	Pit: Love 43-23 Res.	0.35

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.

The 14-9 well was removed from the project proposal due to its proximity to a red-tailed hawk nest.

#### 4.2.4.1. Cumulative effects

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

#### 4.2.5. Threatened and Endangered and Sensitive Species

Within the BLM Buffalo Field Office there are 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
<b>Endangered</b> Black-footed ferret ( <i>Mustela nigripes</i> )	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	Suitable habitat of insufficient size.
<b>Threatened</b> Bald eagle ( <i>Haliaeetus leucocephalus</i> )	Mature forest cover often within one mile of large water body.	S	LAA	Overhead power and improved roads present.
Ute ladies'-tresses orchid ( <i>Spiranthes diluvialis</i> )	Riparian areas with permanent water	NP	NE	Historically perennial water 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.

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**

Two pipeline corridors will be added to existing roads through two of the prairie dog colonies. Because it is highly unlikely ferrets are present and habitat is of insufficient size to support a ferret population, implementation of the proposed development should have no effect on the black-footed ferret.

#### **4.2.5.1.2. Bald eagle**

Based on the raptor nesting and bald eagle winter roost surveys and lack of suitable habitat, it is unlikely bald eagles nest or roost within the Carr Draw 1 Addition 1 project area. The proposed project should not affect bald eagle nesting or winter roosting.

There are 12.53 miles of existing overhead three-phase distribution lines within the project area. The wire spacing is likely in compliance with the Avian Power Line Interaction Committee's (1996) suggested practices and with the Service's standards (USFWS 2002); however other features may not be in compliance. Williams is proposing an additional 3.1 miles of overhead three-phase distribution lines. There are currently 13.8 miles of two-track roads and 11.4 miles of improved roads within the project area, with 8.2 miles and 0 miles proposed, respectively.

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 1 Addition 1 project area. From May 2003, through December 28, 2006, Service Law Enforcement salvage records for northeast Wyoming identified that 156 raptors, including 1 bald eagle, 93 golden eagles, 1 unidentified eagle, 27 hawks, 30 owls and 4 unidentified raptors were electrocuted on power poles within the Powder River Basin Oil and Gas Project area (USFWS 2006a). Of the 156 raptors electrocuted 31 were at power poles that are considered new construction (post 1996 construction standards). Additionally, two golden eagles and a Cooper's hawk were killed in apparent mid span collisions with powerlines (USFWS 2006a). Power lines not constructed to APLIC suggestions pose an electrocution hazard for eagles and other raptors perching on them; the Service has developed additional specifications improving upon the APLIC suggestions. Constructing power lines to the APLIC suggestions and Service standards minimizes but does not eliminate electrocution risk.

Roads present a collision hazard, primarily from bald eagles scavenging on carcasses resulting from other road related wildlife mortalities. Collision risk increases with automobile travel speed. Typically two-tracks and improved project roads pose minimal collision risk. In one year of monitoring road-side carcasses the BLM Buffalo Field Office reported 439 carcasses, 226 along Interstates (51%), 193 along paved highways (44%), 19 along gravel county roads (4%), and 1 along an improved CBNG road (<1%) (Bills 2004). No road-killed eagles were reported; eagles (bald and golden) were observed feeding on 16 of the reported road-side carcasses (<4%).

Produced water will be stored in 35 proposed reservoirs which may attract eagles if reliable prey is present, most likely in the form of waterfowl. The effect of the reservoirs on eagles is unknown. The reservoirs could prove to be a benefit (e.g. increased food supply) or an adverse effect (e.g. contaminants, proximity of power lines and/or roads to water). 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**

Many of the reservoirs are located within ephemeral drainages of the Powder River. Remaining proposed reservoirs are located in upland habitats. No spring has been identified within the project area. Suitable habitat is not present within the Carr Draw 1 Addition 1 project area.

Reservoir seepage may create suitable habitat if historically ephemeral drainages become perennial, however no historic seed source is present within or upstream of the project area. Implementation of the proposed coal bed natural gas project should not affect the Ute ladies'- tresses orchid as suitable habitat is not present.

#### **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
<b>Amphibians</b>				
Northern leopard frog ( <i>Rana pipiens</i> )	Beaver ponds, permanent water in plains and foothills	S	MIIH	Additional water will affect existing waterways. Prairie not mountain habitat.
Spotted frog ( <i>Ranus pretiosa</i> )	Ponds, sloughs, small streams	NP	NI	
<b>Birds</b>				
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 colonies present.
Ferruginous hawk ( <i>Buteo regalis</i> )	Basin-prairie shrub, grasslands, rock outcrops	K	MIIH	Grassland and shrubland habitats will be affected.
Greater sage-grouse ( <i>Centrocercus urophasianus</i> )	Basin-prairie shrub, mountain-foothill shrub	S	MIIH	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	New reservoirs may increase usage during migration.
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
<b>Fish</b>				
Yellowstone cutthroat trout ( <i>Oncorhynchus clarki bouvieri</i> )	Mountain streams and rivers in Tongue River drainage	NP	NI	Outside species range.
<b>Mammals</b>				
Black-tailed prairie dog ( <i>Cynomys ludovicianus</i> )	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	K	MIIH	Four prairie dog towns within the project area.
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 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
<b>Plants</b>				
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.
- WIFV** 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. (Trigger for a Significant Action as defined in NEPA)
- BI** Beneficial Impact

#### **4.2.5.2.1. Black-tailed prairie dog**

Two pipeline corridors will be added to existing roads through two of the prairie dog colonies. The presence of pipelines may limit colony expansion. Nearby power poles may provide habitats for mammal and avian predators increasing prairie dog predation. Mineral related traffic on the adjacent road may result in prairie dog road mortalities.

#### **4.2.5.2.2. Greater sage-grouse**

Five documented sage-grouse leks are present within two miles of the project area. Due to preplanning by WLS, much of the infrastructure associated with this project avoids sage-grouse habitat. The landowner, though, ultimately chose to locate infrastructure within sage-grouse habitat in many areas. The BLM BFO biologist attempted to reduce sage-grouse habitat disturbances by reducing corridor widths and relocating road routes to the edges of sage-grouse habitats.

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.

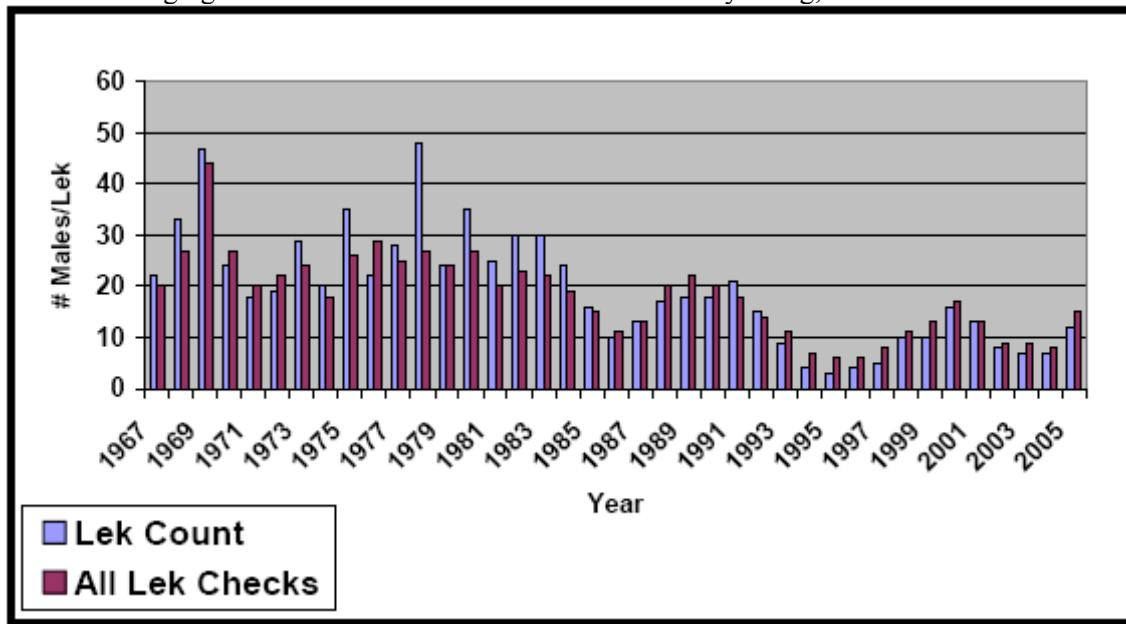
Additional studies, across more of the sage-grouse's range, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported only 45% of their sage grouse hens nested within 3 km (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 1. Male sage-grouse lek attendance within northeastern Wyoming, 1967-2005.



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

A two-mile timing limitation given the long-term population decline and that less than 50% of grouse are expected to nest within the limitation area is 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 adjacent to the project area 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 should not affect mountain plovers as habitat is limited to the prairie dog towns within the project area. The only facilities proposed within the prairie dog towns are pipelines. After reclamation, these areas will return to suitable habitat. Mountain plover surveys will be required within the prairie dog towns on an annual basis until project completion.

#### **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 CBM 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 CBM operations.

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

BLM will keep monitoring this issue by continuing to consult with the State agencies and the researchers working in the area in order to stay abreast of the most current developments and any need to apply mitigation. 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 8.5 gpm per well or 408.0 gpm (0.9 cfs or 650 acre-feet per year) for this POD. The PRB FEIS projected the total amount of water that was anticipated to be produced from CBNG development per year (Table 2-8 Projected Amount of Water Produced from CBM Wells Under Alternatives 1, 2A and 2B pg 2-26). For the Upper Powder River drainage, the projected volume produced within the watershed area was 163,521 acre-feet in 2007 (maximum production was projected to occur in 2006 at 171,423 acre-feet). As such, the volume of water resulting from the production of these wells is 0.4% of the total volume projected for 2007, which is a small proportion of the present and expected 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 Powder River drainage area (PRB FEIS pg 4-5). For this action, it may be assumed that a maximum of 163 gpm will infiltrate at or near the discharge points and impoundments (85,777,920 gallons per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater used for stock and domestic purposes. According to the PRB FEIS, "...the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater." (PRB FEIS pg 4-54). However, there is potential for infiltration of produced water to influence the quality of the antecedent groundwater. The WDEQ requires that operators determine initial groundwater quality below impoundments to be used for CBNG produced water storage. If high quality water is detected (Class 3 or better) the operator is required to establish a groundwater monitoring program at those impoundments.

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 and Siting Requirements for Unlined Coalbed Methane Produced Water Impoundments" which was approved in September of 2006. For WYPDES permits received by DEQ after the August 1, 2004, effective date, the BLM requires that operators comply with the current approved DEQ compliance monitoring guidance document prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is possible impacts to the groundwater. "The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of water wells in the area. The permitted water wells in the area produce from water bearing zones ranging in depth from 33 to 1010 feet below the ground surface. The targeted coal zones range from 1272 to 2228 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 CBM 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 CBM 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 gaging stations at high and low monthly flows, and Wyoming groundwater quality standards for TDS and SAR for Class I to Class III water. It also shows 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 –		2	1000
Least Restrictive Proposed Limit		10	3200
Powder River at Arvada Gauging station			
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)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	8	2000

<b>Predicted Values</b>	<b>TDS, mg/l</b>	<b>SAR</b>	<b>EC, <math>\mu</math>mhos/cm</b>
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0049999 At discharge point	5000	18	3000
WDEQ Water Quality Requirement for WYPDES Permit # WY0054208 At discharge point At Irrigation Compliance point	5000	6	7500 2000
WDEQ Water Quality Requirement for WYPDES Permit # WY0055026 (DRAFT) At discharge point	5000		7500
Predicted Produced Water Quality Big George Gates/Wall	1230 1300	18.4 18.2	1900 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 projected to be produced from this POD has 1230.0 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). However direct land application is not included in this proposal. If at any future time the operator entertains the possibility of irrigation or land application with the water produced from these wells, the proposal must be submitted as a sundry notice for separate environmental analysis and approval by the BLM.

The quality for the water produced from the Big George 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 8.5 gallons per minute (gpm) is projected is to be produced from these 15 wells, for a total of 127.5 gpm for the POD (see Table 4.4).

The quality for the water produced from the Gates-Wall 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 8.5 gpm is projected is to be produced from these 33 wells, for a total of 280.5.0 gpm for the POD. See Table 4.4.

Total water production for this project is expected to be 408 gpm.

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

There are 35 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, 41 impoundments (567 acre-feet) will be used. Of these, 6 are existing and being used and 35 would potentially be constructed within the project area. These proposed impoundments will disturb approximately 100 acres including the dam structures. All of these water impoundments would be on-channel reservoirs. Two existing impoundments not currently being used to store CBNG produced water will be upgraded and all 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 0.14 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 could provide improved channel stability through the establishment of wetland-riparian species. 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 would 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 48 wells is anticipated to be a total of 408.0 gpm or 0.9 cfs to impoundments. Using an assumed conveyance loss of 20% (PRB FEIS pg 4-74) and full containment the produced water re-surfacing in Fortification Creek from this action (0.14 cfs) may add a maximum 0.11 cfs to the Upper Powder River flows, or 0.2% of the predicted total CBNG produced water contribution. This incremental volume is statistically below the measurement capabilities for the volume of flow of the Powder River (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 7). Based on the area of the Fortification Creek watershed above the POD (77 sq mi) and an assumed density of 1 well per location every 80 acres, the potential exists for the development of 616 wells which could produce a maximum flow rate of 5236 gpm (12 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, 12 cfs, is much less than the volume of runoff estimated from the 2-year storm event for Fortification Creek.

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 as a result of this project from the WDEQ.

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

	WY0049999	WY0054208	WY0055026
Total Petroleum Hydrocarbons	10 mg/l max		
pH	6.5 to 8.5	6.5 to 9.0	6.5 to 9.0
TDS	5000 mg/l max	5000 mg/l max	5000 mg/l
Specific Conductance	7500 µS/cm	2000-7500 µS/cm	7500 µS/cm
Sulfates	3000 mg/l max		
Radium 226	1 pCi/l max		
Dissolved iron	1000 µg/l max	1000 µg/l max	1000 µg/l max
Dissolved manganese	630 µg/l max		
Total Barium	1800 µg/l max	1800 µg/l max	1800 µg/l max
Total Arsenic	7 µg/l max	7 µg/l max	7 µg/l max
Chlorides	46 mg/l	150 mg/l	150 mg/l
Aluminum		750 µg/l	
Dissolved Flouride		2000 µg/l	
SAR (unitless)		6 @ ICP	

WYPDES permit WY0054208 addresses existing downstream concerns, such as irrigation use, on Sand Draw, a tributary to Wild Horse Creek, in the COA for the permit. The designated point of compliance identified for this permit is in the NW quarter of the SE quarter of section 19, township 51 N, range 74 W. No irrigation compliance point was established on Fortification Creek. However, draft WYPDES permit WY0055026 states on page 2, “Facility Description”, that no discharge will be permitted “...from these lowermost reservoirs except during periods of time in which natural precipitation causes the reservoirs to overtop and spill. Intentional discharges from the lowermost reservoirs will be considered a violation of this permit.” The “lowermost” reservoirs identified in this draft permit are Love 24-04-5075, Love 31-09-5075 (which was dropped), Love 11-10-5075, Love 31-10-5075, Love 22-10-5075, Love 43-09-5075, Love 21-16-5075, Love 23-09-5075 and Love 21-08-5075.

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

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

In-channel downstream impacts are addressed in the “Downstream Concerns” section of the WMP, pages 33-35, for the Carr Draw I Addition I POD prepared by Western Land Services for Williams Production Company, 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 development continues within the Fortification Creek watershed, the natural ephemeral nature of this drainage will begin to be converted to a perennial system. As described in Section 4.1.1 above, the channel will become saturated from dam seepage and will begin to flow water below the lowest dams. This perennial flow will inundate broad-bottomed swales which have no low flow channels remaining

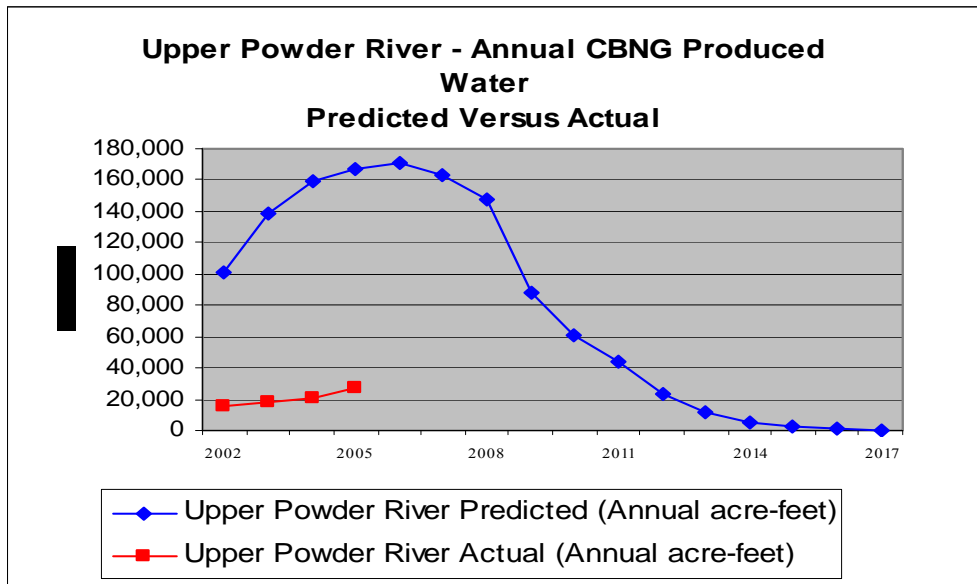
through them. During the winter, ice will form and spread across swales, including those where small channels do exist. The total impact of this “perennialization” has not been documented or studied extensively in the Powder River Basin and only assumptions of the final effects can be made. Adaptive management will become an important component of mitigating damages caused by this phenomenon.

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 14.7 % 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-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2002	100,512	100,512	15,846	15.8	15,846	15.8
2003	137,942	238,454	18,578	13.5	34,424	14.4
2004	159,034	397,488	20,991	13.2	55,414	13.9
2005	167,608	565,096	27,658	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				
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				
<b>Total</b>	<b>1,285,233</b>					

**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 CBM development in both states continued. As the two states develop a better understanding of the effects of CBM discharges through the enhanced monitoring required by the MOC, they can adjust the permitting approaches to allow more or less discharges to the Powder River drainage. Thus, through the implementation of in-stream monitoring and adaptive management, water quality standards and interstate agreements can be met.” (PRB FEIS page 4-117)

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

No eligible historic resources will be affected by the proposed development, and cultural clearance is recommended. 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
Duane Joslyn	Operation Supervisor	Williams Production RMT	Yes
Rex Lynde	Drilling	Williams Production RMT	Yes
Ralph Demel	Construction Forman	Western Land Services	Yes
Randee Jespersen	Land Manager	Williams Production RMT	Yes
Patrick Barker	Project Manager	Western Land Services	Yes
Allen Aksamit	Wildlife Biologist	Western Land Services	Yes
Todd Merchen	Engineer	Lowham Engineering	Yes
Jason Weston	Archeologist	Western Land Services	Yes
BJ Earle	Archeologist	BLM	Yes
Ben Adams	Hydrologist	BLM	Yes
Jennifer Morton	Wildlife Biologist	BLM	Yes
Lee Harrelson	Civil Engineer	BLM	Yes
Jennifer Spagon	Natural Resource Specialist	BLM	Yes
Christy Love	Love Land and Cattle Company	Surface Owner	Yes
Dave Belus	Love Land and Cattle Lessee	Surface Owner's Lessee	Yes

#### 6. OTHER PERMITS REQUIRED

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

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