FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Williams Production RMT
South Prong Unit 1&2 and Laskie Draw
ENVIRONMENTAL ASSESSMENT –WY-070-08-142

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Williams Production RMT's South Prong Unit 1&2 and Laskie Coal Bed Natural Gas (CBNG) POD comprised of the following 175 Applications for Permit to Drill (APDs)): with 8 APDs to be pending approval following the 30 day public posting period as indicated in the following table:

***Note:** These APD's will be pending the 30-day public posting period ending August 1, 2008.
**** Note:** This APD will be held pending the 30 day public posting period ending August 11, 2008.

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
1	LASKIE DRAW SPU	23-4GW	NESW	4	49N	76W	WYW33136
2	LASKIE DRAW SPU	43-4GW	NESE	4	49N	76W	WYW33136
3	LASKIE DRAW SPU	12-9GW	SWNW	9	49N	76W	WYW153071
4	LASKIE DRAW SPU	14-9GW	SWSW	9	49N	76W	WYW153071
5	LASKIE DRAW SPU	21-9GW	NENW	9	49N	76W	WYW153071
6	**LASKIE DRAW SPU**	****22-9GW**	**SENW**	**9**	**49N**	**76W**	**WYW153071**
7	LASKIE DRAW SPU	23-9GW	NESW	9	49N	76W	WYW153071
8	LASKIE DRAW SPU	32-9GW	SWNE	9	49N	76W	WYW153071
9	LASKIE DRAW SPU	34-9GW	SWSE	9	49N	76W	WYW153071
10	LASKIE DRAW SPU	41-9GW	NENE	9	49N	76W	WYW153071
11	LASKIE DRAW SPU	43-9GW	NESE	9	49N	76W	WYW153071
12	SPU 1 & 2	12-18BG	SWNW	18	49N	75W	WYW0157205
13	SPU 1 & 2	12-18GW	SWNW	18	49N	75W	WYW0157205
14	**SPU 1 & 2**	***21-18BG**	**NENW**	**18**	**49N**	**75W**	**WYW0157205**
15	**SPU 1 & 2**	***21-18GW**	**NENW**	**18**	**49N**	**75W**	**WYW0157205**
16	SPU 1 & 2	41-18BG	NENE	18	49N	75W	WYW0161146
17	SPU 1 & 2	41-18GW	NENE	18	49N	75W	WYW0161146
18	SPU 1 & 2	12-19BG	SWNW	19	49N	75W	WYW027957A
19	SPU 1 & 2	12-19GW	SWNW	19	49N	75W	WYW027957A
20	SPU 1 & 2	14-19BG	SWSW	19	49N	75W	WYW027957A
21	SPU 1 & 2	14-19GW	SWSW	19	49N	75W	WYW027957A
22	SPU 1 & 2	21-19BG	NENW	19	49N	75W	WYW027957A
23	SPU 1 & 2	21-19GW	NENW	19	49N	75W	WYW027957A
24	SPU 1 & 2	23-19BG	NESW	19	49N	75W	WYW027957A
25	SPU 1 & 2	23-19GW	NESW	19	49N	75W	WYW027957A
26	SPU 1 & 2	32-19BG	SWNE	19	49N	75W	WYW0157205
27	SPU 1 & 2	32-19GW	SWNE	19	49N	75W	WYW0157205
28	SPU 1 & 2	34-19BG	SWSE	19	49N	75W	WYW0157205
29	SPU 1 & 2	34-19GW	SWSE	19	49N	75W	WYW0157205
30	SPU 1 & 2	41-19BG	NENE	19	49N	75W	WYW0157205
31	SPU 1 & 2	41-19GW	NENE	19	49N	75W	WYW0157205
32	SPU 1 & 2	43-19BG	NESE	19	49N	75W	WYW0157205
33	SPU 1 & 2	43-19GW	NESE	19	49N	75W	WYW0157205
34	SPU 1 & 2	12-20BG	SWNW	20	49N	75W	WYW0157206
35	SPU 1 & 2	12-20GW	SWNW	20	49N	75W	WYW0157206
36	SPU 1 & 2	22-20BG	SENW	20	49N	75W	WYW0157206
37	SPU 1 & 2	22-20GW	SENW	20	49N	75W	WYW0157206
38	SPU 1 & 2	12-1BG	SWNW	1	49N	76W	WYW012943

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
39	SPU 1 & 2	12-1GW	SWNW	1	49N	76W	WYW012943
40	SPU 1 & 2	24-1BG	SESW	1	49N	76W	WYW012943
41	SPU 1 & 2	24-1GW	SESW	1	49N	76W	WYW012943
42	SPU 1 & 2	43-1BG	NESE	1	49N	76W	WYW33136
43	SPU 1 & 2	43-1GW	NESE	1	49N	76W	WYW33136
44	SPU 1 & 2	12-2BG	SWNW	2	49N	76W	WYW33136
45	SPU 1 & 2	12-2LW	SWNW	2	49N	76W	WYW33136
46	SPU 1 & 2	41-2BG	NENE	2	49N	76W	WYW012943
47	SPU 1 & 2	41-2GW	NENE	2	49N	76W	WYW012943
48	SPU 1 & 2	43-2BG	NESE	2	49N	76W	WYW012943
49	SPU 1 & 2	43-2GW	NESE	2	49N	76W	WYW012943
50	SPU 1 & 2	32-3BG	SWNE	3	49N	76W	WYW33136
51	SPU 1 & 2	32-3LW	SWNE	3	49N	76W	WYW33136
52	SPU 1 & 2	41-3BG	NENE	3	49N	76W	WYW33136
53	SPU 1 & 2	41-3LW	NENE	3	49N	76W	WYW33136
54	SPU 1 & 2	32-4BG	SWNE	4	49N	76W	WYW33136
55	SPU 1 & 2	32-4LW	SWNE	4	49N	76W	WYW33136
56	SPU 1 & 2	12-10BG	SWNW	10	49N	76W	WYW153071
57	SPU 1 & 2	12-10GW	SWNW	10	49N	76W	WYW153071
58	SPU 1 & 2	14-10BG	SWSW	10	49N	76W	WYW153071
59	SPU 1 & 2	14-10GW	SWSW	10	49N	76W	WYW153071
60	SPU 1 & 2	21-10BG	NENW	10	49N	76W	WYW153071
61	SPU 1 & 2	21-10GW	NENW	10	49N	76W	WYW153071
62	SPU 1 & 2	23-10BG	NESW	10	49N	76W	WYW153071
63	SPU 1 & 2	23-10GW	NESW	10	49N	76W	WYW153071
64	SPU 1 & 2	34-10BG	SWSE	10	49N	76W	WYW153071
65	SPU 1 & 2	34-10GW	SWSE	10	49N	76W	WYW153071
66	SPU 1 & 2	12-11BG	SWNW	11	49N	76W	WYW33136
67	SPU 1 & 2	12-11GW	SWNW	11	49N	76W	WYW33136
68	**SPU 1 & 2**	***21-11BG**	**NENW**	**11**	**49N**	**76W**	**WYW33136**
69	SPU 1 & 2	21-11LW	NENW	11	49N	76W	WYW33136
70	SPU 1 & 2	23-11BG	NESW	11	49N	76W	WYW33136
71	SPU 1 & 2	23-11GW	NESW	11	49N	76W	WYW33136
72	SPU 1 & 2	32-11BG	SWNE	11	49N	76W	WYW012943
73	SPU 1 & 2	32-11LW	SWNE	11	49N	76W	WYW012943
74	SPU 1 & 2	34-11BG	SWSE	11	49N	76W	WYW33136
75	SPU 1 & 2	34-11GW	SWSE	11	49N	76W	WYW33136
76	SPU 1 & 2	41-11BG	NENE	11	49N	76W	WYW012943
77	SPU 1 & 2	41-11LW	NENE	11	49N	76W	WYW012943
78	SPU 1 & 2	43-11BG	NESE	11	49N	76W	WYW012943
79	SPU 1 & 2	43-11GW	NESE	11	49N	76W	WYW012943
80	SPU 1 & 2	11-12BG	NWNW	12	49N	76W	WYW012943
81	SPU 1 & 2	11-12LW	NWNW	12	49N	76W	WYW012943
82	SPU 1 & 2	13-12BG	NWSW	12	49N	76W	WYW012943
83	SPU 1 & 2	13-12LW	NWSW	12	49N	76W	WYW012943
84	SPU 1 & 2	14-12BG	SWSW	12	49N	76W	WYW012943
85	SPU 1 & 2	14-12GW	SWSW	12	49N	76W	WYW012943
86	SPU 1 & 2	23-12BG	NESW	12	49N	76W	WYW012944A
87	SPU 1 & 2	23-12LW	NESW	12	49N	76W	WYW012944A
88	SPU 1 & 2	32-12BG	SWNE	12	49N	76W	WYW012944

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
89	SPU 1 & 2	32-12LW	SWNE	12	49N	76W	WYW012944
90	SPU 1 & 2	34-12BG	SWSE	12	49N	76W	WYW012944
91	SPU 1 & 2	34-12LW	SWSE	12	49N	76W	WYW012944
92	SPU 1 & 2	41-12BG	NENE	12	49N	76W	WYW012944
93	SPU 1 & 2	41-12LW	NENE	12	49N	76W	WYW012944
94	SPU 1 & 2	43-12BG	NESE	12	49N	76W	WYW012944
95	SPU 1 & 2	43-12GW	NESE	12	49N	76W	WYW012944
96	**SPU 1 & 2**	***13-13BG**	**NWSW**	**13**	**49N**	**76W**	**WYW0161144**
97	**SPU 1 & 2**	***13-13GW**	**NWSW**	**13**	**49N**	**76W**	**WYW0161144**
98	SPU 1 & 2	14-13BG	SWSW	13	49N	76W	WYW023996
99	SPU 1 & 2	14-13GW	SWSW	13	49N	76W	WYW023996
100	SPU 1 & 2	23-13BG	NESW	13	49N	76W	WYW023996
101	SPU 1 & 2	23-13GW	NESW	13	49N	76W	WYW023996
102	SPU 1 & 2	34-13BG	SWSE	13	49N	76W	WYW023996
103	SPU 1 & 2	34-13GW	SWSE	13	49N	76W	WYW023996
104	SPU 1 & 2	11-14BG	NWNW	14	49N	76W	WYW138444
105	SPU 1 & 2	11-14GW	NWNW	14	49N	76W	WYW138444
106	SPU 1 & 2	12-14BG	SWNW	14	49N	76W	WYW138444
107	SPU 1 & 2	12-14GW	SWNW	14	49N	76W	WYW138444
108	**SPU 1 & 2**	***13-14BG**	**NWSW**	**14**	**49N**	**76W**	**WYW161144**
109	**SPU 1 & 2**	***13-14GW**	**NWSW**	**14**	**49N**	**76W**	**WYW161144**
110	SPU 1 & 2	14-14BG	SWSW	14	49N	76W	WYW0161144
111	SPU 1 & 2	14-14GW	SWSW	14	49N	76W	WYW0161144
112	SPU 1 & 2	21-14BG	NENW	14	49N	76W	WYW138444
113	SPU 1 & 2	21-14GW	NENW	14	49N	76W	WYW138444
114	SPU 1 & 2	32-14BG	SWNE	14	49N	76W	WYW138444
115	SPU 1 & 2	32-14GW	SWNE	14	49N	76W	WYW138444
116	SPU 1 & 2	34-14BG	SWSE	14	49N	76W	WYW0161144
117	SPU 1 & 2	34-14GW	SWSE	14	49N	76W	WYW0161144
118	SPU 1 & 2	42-14BG	SENE	14	49N	76W	WYW138444
119	SPU 1 & 2	42-14GW	SENE	14	49N	76W	WYW138444
120	SPU 1 & 2	12-15BG	SWNW	15	49N	76W	WYW153071
121	SPU 1 & 2	12-15GW	SWNW	15	49N	76W	WYW153071
122	SPU 1 & 2	13-15BG	NWSW	15	49N	76W	WYW153071
123	SPU 1 & 2	13-15GW	NWSW	15	49N	76W	WYW153071
124	SPU 1 & 2	21-15BG	NENW	15	49N	76W	WYW153071
125	SPU 1 & 2	21-15GW	NENW	15	49N	76W	WYW153071
126	SPU 1 & 2	23-15BG	NESW	15	49N	76W	WYW153071
127	SPU 1 & 2	23-15GW	NESW	15	49N	76W	WYW153071
128	SPU 1 & 2	32-15BG	SWNE	15	49N	76W	WYW153071
129	SPU 1 & 2	32-15GW	SWNE	15	49N	76W	WYW153071
130	SPU 1 & 2	34-15BG	SWSE	15	49N	76W	WYW153071
131	SPU 1 & 2	34-15GW	SWSE	15	49N	76W	WYW153071
132	SPU 1 & 2	41-15BG	NENE	15	49N	76W	WYW153071
133	SPU 1 & 2	41-15GW	NENE	15	49N	76W	WYW153071
134	SPU 1 & 2	43-15BG	NESE	15	49N	76W	WYW153071
135	SPU 1 & 2	43-15GW	NESE	15	49N	76W	WYW153071
136	SPU 1 & 2	32-22BG	SWNE	22	49N	76W	WYW153071
137	SPU 1 & 2	32-22GW	SWNE	22	49N	76W	WYW153071
138	SPU 1 & 2	41-22BG	NENE	22	49N	76W	WYW153071

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
139	SPU 1 & 2	41-22GW	NENE	22	49N	76W	WYW153071
140	SPU 1 & 2	12-23BG	SWNW	23	49N	76W	WYW0161144
141	SPU 1 & 2	12-23GW	SWNW	23	49N	76W	WYW0161144
142	SPU 1 & 2	21-23BG	NENW	23	49N	76W	WYW138444
143	SPU 1 & 2	21-23GW	NENW	23	49N	76W	WYW138444
144	SPU 1 & 2	32-23BG	SWNE	23	49N	76W	WYW138444
145	SPU 1 & 2	32-23GW	SWNE	23	49N	76W	WYW138444
146	SPU 1 & 2	34-23BG	SWSE	23	49N	76W	WYW0161144
147	SPU 1 & 2	34-23GW	SWSE	23	49N	76W	WYW0161144
148	SPU 1 & 2	41-23BG	NENE	23	49N	76W	WYW138444
149	SPU 1 & 2	41-23GW	NENE	23	49N	76W	WYW138444
150	SPU 1 & 2	43-23BG	NESE	23	49N	76W	WYW0161144
151	SPU 1 & 2	43-23GW	NESE	23	49N	76W	WYW0161144
152	SPU 1 & 2	14-24BG	SWSW	24	49N	76W	WYW0161144
153	SPU 1 & 2	14-24GW	SWSW	24	49N	76W	WYW0161144
154	SPU 1 & 2	23-24BG	NESW	24	49N	76W	WYW023996
155	SPU 1 & 2	23-24GW	NESW	24	49N	76W	WYW023996
156	SPU 1 & 2	34-24BG	SWSE	24	49N	76W	WYW023996
157	SPU 1 & 2	34-24GW	SWSE	24	49N	76W	WYW023996
158	SPU 1 & 2	43-24BG	NESE	24	49N	76W	WYW023996
159	SPU 1 & 2	43-24GW	NESE	24	49N	76W	WYW023996
160	SPU 1 & 2 BELUS	14-17BG	SWSW	17	49N	75W	WYW027956C
161	SPU 1 & 2 49 RANCH	14-30BG	SWSW	30	49N	75W	WYW134226
162	SPU 1 & 2 49 RANCH	14-30GW	SWSW	30	49N	75W	WYW134226
163	SPU 1 & 2 BELUS	14-17GW	SWSW	17	49N	75W	WYW027956C
164	SPU 1 & 2 J RECORD	14-7BG*	SWSW	7	49N	75W	WYW027956C
165	SPU 1 & 2 J RECORD	14-7GW	SWSW	7	49N	75W	WYW027956C
166	SPU 1 & 2 J RECORD	23-7BG	NESW	7	49N	75W	WYW135913
167	SPU 1 & 2 J RECORD	23-7GW	NESW	7	49N	75W	WYW135913
168	SPU 1 & 2 RECORD	21-13BG	NENW	13	49N	76W	WYW040493A
169	SPU 1 & 2 RECORD	21-13GW	NENW	13	49N	76W	WYW040493A
170	SPU 1 & 2 RECORD	22-13BG	SENW	13	49N	76W	WYW040493A
171	SPU 1 & 2 RECORD	22-13GW	SENW	13	49N	76W	WYW040493A
172	SPU 1 & 2 RECORD	32-13BG	SWNE	13	49N	76W	WYW040493
173	SPU 1 & 2 RECORD	32-13GW	SWNE	13	49N	76W	WYW040493
174	SPU 1 & 2 RECORD	41-13BG	NENE	13	49N	76W	WYW040493
175	SPU 1 & 2 RECORD	41-13GW	NENE	13	49N	76W	WYW040493
176	SPU 1 & 2 RECORD	12-24BG	SWNW	24	49N	76W	WYW040493
177	SPU 1 & 2 RECORD	12-24GW	SWNW	24	49N	76W	WYW040493
178	SPU 1 & 2 RECORD	21-24BG	NENW	24	49N	76W	WYW040493
179	SPU 1 & 2 RECORD	21-24GW	NENW	24	49N	76W	WYW040493
180	SPU 1 & 2 RECORD	32-24BG	SWNE	24	49N	76W	WYW040493
181	SPU 1 & 2 RECORD	32-24GW	SWNE	24	49N	76W	WYW040493
182	SPU 1 & 2 RECORD	41-24BG	NENE	24	49N	76W	WYW040493
183	SPU 1 & 2 RECORD	41-24GW	NENE	24	49N	76W	WYW040493

The following impoundments were inspected and approved for use in association with the water management strategy for the POD.

	IMPOUNDMENT Name / Number	Qtr/Qtr	Section	TWP	RNG	Capacity (Acre Feet)	Surface Disturb (Acres)	Lease #
1	WIDE TOP	SENW	2	49	76	4.4	1.5	FEE
2	GRASSY FLAT	SENE	3	49	76	8.1	2.5	WYW033136
3	LANEY	SESW	34	50	76	5.05	1.5	WYW033136
4	BESSIE HOLMS	SESE	34	50	76	4.75	1.5	WYW033138
5	RECORD 12-3-4976	SWNW	3	49	76	24.29	4	FEE
6	RECORD 32-11-4976	SWNE	11	49	76	31.22	5.5	WYW0012943
7	WILLIAMS 14-28-4975--Secondary	SWSW	28	49	75	73.5	7	WYW0013598
8	RECORD 22-18-4975--Secondary	SENW	18	49	75	31.44	4.5	WYW0157205
9	RECORD 42-11-4976	SENE	11	49	76	36.61	6	WYW0012943
10	RECORD 42-13-4976	SENE	13	49	76	47.26	7	FEE

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

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

1. The Operator, in their POD, has committed to:
    - Comply with all applicable Federal, State and Local laws and regulations.
    - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
    - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD.
    - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowner(s).
3. Alternative C will not result in any undue or unnecessary environmental degradation.
4. It is in the public interest to approve these wells, as the leases are being drained of federal gas, resulting in a loss of revenue for the government.
5. Mitigation measures applied by the BLM will alleviate 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
South Prong Unit 1&2 and Laskie Draw
PLAN OF DEVELOPMENT
WY-070-08-142

INTRODUCTION

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

1. PURPOSE AND NEED

The purpose for the proposal is to produce coal bed natural gas (CBNG) on 20 federal oil and gas mineral leases issued to the applicant by the BLM.

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

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

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative A - No Action

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

2.2. Alternative B Proposed Action

Proposed Action Title/Type: Williams Production RMT's South Prong Unit 1&2 and Laskie Plans of Development (PODs) for 188 coal bed natural gas well APD`s and associated infrastructure.

Proposed Well Information: There are 188 wells proposed within this POD, the wells are vertical bores proposed on an 80 acre spacing pattern. Wells will produce from 3 different coal seams the Lower Wall, Gates Wall, and the Big George. The majority of locations have 2 wells per location. Proposed well house dimensions are 4 ft width x 4 ft length x 6 ft height. Well house color is Covert Green 18-0617TPX (Pantone Architecture and Interior Color Guide, 2003); the color was selected to blend with the surrounding vegetation. Proposed wells are located as follows:

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
1	LASKIE DRAW SPU	12-9GW	SWNW	9	49N	76W	WYW153071

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
2	LASKIE DRAW SPU	14-9GW	SWSW	9	49N	76W	WYW153071
3	LASKIE DRAW SPU	R/14-4GW*	SWSW	4	49N	76W	WYW33136
4	LASKIE DRAW SPU	23-4GW	NESW	4	49N	76W	WYW33136
5	LASKIE DRAW SPU	R/34-4GW	SWSE	4	49N	76W	WYW33136
6	LASKIE DRAW SPU	43-4GW	NESE	4	49N	76W	WYW33136
7	LASKIE DRAW SPU	21-9GW	NENW	9	49N	76W	WYW153071
8	LASKIE DRAW SPU	23-9GW	NESW	9	49N	76W	WYW153071
9	LASKIE DRAW SPU	32-9GW	SWNE	9	49N	76W	WYW153071
10	LASKIE DRAW SPU	34-9GW	SWSE	9	49N	76W	WYW153071
11	LASKIE DRAW SPU	41-9GW	NENE	9	49N	76W	WYW153071
12	LASKIE DRAW SPU	43-9GW	NESE	9	49N	76W	WYW153071
13	SPU 1 & 2	43-19BG	NESE	19	49N	75W	WYW0157205
14	SPU 1 & 2	12-18BG	SWNW	18	49N	75W	WYW0157205
15	SPU 1 & 2	12-18GW	SWNW	18	49N	75W	WYW0157205
16	SPU 1 & 2	R/31-18BG	NWNE	18	49N	75W	WYW0157205
17	SPU 1 & 2	R/31-18GW	NWNE	18	49N	75W	WYW0157205
18	SPU 1 & 2	41-18BG	NENE	18	49N	75W	WYW0161146
19	SPU 1 & 2	41-18GW	NENE	18	49N	75W	WYW0161146
20	SPU 1 & 2	12-19BG	SWNW	19	49N	75W	WYW027957A
21	SPU 1 & 2	12-19GW	SWNW	19	49N	75W	WYW027957A
22	SPU 1 & 2	14-19BG	SWSW	19	49N	75W	WYW027957A
23	SPU 1 & 2	14-19GW	SWSW	19	49N	75W	WYW027957A
24	SPU 1 & 2	21-19BG	NENW	19	49N	75W	WYW027957A
25	SPU 1 & 2	21-19GW	NENW	19	49N	75W	WYW027957A
26	SPU 1 & 2	23-19BG	NESW	19	49N	75W	WYW027957A
27	SPU 1 & 2	23-19GW	NESW	19	49N	75W	WYW027957A
28	SPU 1 & 2	32-19BG	SWNE	19	49N	75W	WYW0157205
29	SPU 1 & 2	32-19GW	SWNE	19	49N	75W	WYW0157205
30	SPU 1 & 2	34-19BG	SWSE	19	49N	75W	WYW0157205
31	SPU 1 & 2	34-19GW	SWSE	19	49N	75W	WYW0157205
32	SPU 1 & 2	41-19BG	NENE	19	49N	75W	WYW0157205
33	SPU 1 & 2	41-19GW	NENE	19	49N	75W	WYW0157205
34	SPU 1 & 2	43-19GW	NESE	19	49N	75W	WYW0157205
35	SPU 1 & 2	12-20BG	SWNW	20	49N	75W	WYW0157206
36	SPU 1 & 2	12-20GW	SWNW	20	49N	75W	WYW0157206
37	SPU 1 & 2	22-20BG	SENW	20	49N	75W	WYW0157206
38	SPU 1 & 2	22-20GW	SENW	20	49N	75W	WYW0157206
39	SPU 1 & 2	12-1BG	SWNW	1	49N	76W	WYW012943
40	SPU 1 & 2	12-1GW	SWNW	1	49N	76W	WYW012943
41	SPU 1 & 2	23-10BG	NESW	10	49N	76W	WYW153071
42	SPU 1 & 2	R/23-1BG	NESW	1	49N	76W	WYW012943
43	SPU 1 & 2	R/23-1GW	NESW	1	49N	76W	WYW012943
44	SPU 1 & 2	24-1BG	SESW	1	49N	76W	WYW012943
45	SPU 1 & 2	24-1GW	SESW	1	49N	76W	WYW012943
46	SPU 1 & 2	43-1BG	NESE	1	49N	76W	WYW33136
47	SPU 1 & 2	43-1GW	NESE	1	49N	76W	WYW33136
48	SPU 1 & 2	12-2BG	SWNW	2	49N	76W	WYW33136

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
49	SPU 1 & 2	12-2LW	SWNW	2	49N	76W	WYW33136
50	SPU 1 & 2	41-2BG	NENE	2	49N	76W	WYW012943
51	SPU 1 & 2	41-2GW	NENE	2	49N	76W	WYW012943
52	SPU 1 & 2	43-2BG	NESE	2	49N	76W	WYW012943
53	SPU 1 & 2	43-2GW	NESE	2	49N	76W	WYW012943
54	SPU 1 & 2	32-3BG	SWNE	3	49N	76W	WYW33136
55	SPU 1 & 2	32-3LW	SWNE	3	49N	76W	WYW33136
56	SPU 1 & 2	41-3BG	NENE	3	49N	76W	WYW33136
57	SPU 1 & 2	41-3LW	NENE	3	49N	76W	WYW33136
58	SPU 1 & 2	32-4BG	SWNE	4	49N	76W	WYW33136
59	SPU 1 & 2	32-4LW	SWNE	4	49N	76W	WYW33136
60	SPU 1 & 2	R/41-4BG	NENE	4	49N	76W	WYW33136
61	SPU 1 & 2	R/41-4LW	NENE	4	49N	76W	WYW33136
62	SPU 1 & 2	12-10BG	SWNW	10	49N	76W	WYW153071
63	SPU 1 & 2	12-10GW	SWNW	10	49N	76W	WYW153071
64	SPU 1 & 2	14-10BG	SWSW	10	49N	76W	WYW153071
65	SPU 1 & 2	14-10GW	SWSW	10	49N	76W	WYW153071
66	SPU 1 & 2	21-10BG	NENW	10	49N	76W	WYW153071
67	SPU 1 & 2	21-10GW	NENW	10	49N	76W	WYW153071
68	SPU 1 & 2	23-10GW	NESW	10	49N	76W	WYW153071
69	SPU 1 & 2	34-10BG	SWSE	10	49N	76W	WYW153071
70	SPU 1 & 2	34-10GW	SWSE	10	49N	76W	WYW153071
71	SPU 1 & 2	12-11BG	SWNW	11	49N	76W	WYW33136
72	SPU 1 & 2	12-11GW	SWNW	11	49N	76W	WYW33136
73	SPU 1 & 2	21-11LW	NENW	11	49N	76W	WYW33136
74	SPU 1 & 2	R/22-11BG	SENW	11	49N	76W	WYW33136
75	SPU 1 & 2	23-11BG	NESW	11	49N	76W	WYW33136
76	SPU 1 & 2	23-11GW	NESW	11	49N	76W	WYW33136
77	SPU 1 & 2	32-11BG	SWNE	11	49N	76W	WYW012943
78	SPU 1 & 2	32-11LW	SWNE	11	49N	76W	WYW012943
79	SPU 1 & 2	34-11BG	SWSE	11	49N	76W	WYW33136
80	SPU 1 & 2	34-11GW	SWSE	11	49N	76W	WYW33136
81	SPU 1 & 2	41-11BG	NENE	11	49N	76W	WYW012943
82	SPU 1 & 2	41-11LW	NENE	11	49N	76W	WYW012943
83	SPU 1 & 2	43-11BG	NESE	11	49N	76W	WYW012943
84	SPU 1 & 2	43-11GW	NESE	11	49N	76W	WYW012943
85	SPU 1 & 2	11-12BG	NWNW	12	49N	76W	WYW012943
86	SPU 1 & 2	11-12LW	NWNW	12	49N	76W	WYW012943
87	SPU 1 & 2	13-12BG	NWSW	12	49N	76W	WYW012943
88	SPU 1 & 2	13-12LW	NWSW	12	49N	76W	WYW012943
89	SPU 1 & 2	14-12BG	SWSW	12	49N	76W	WYW012943
90	SPU 1 & 2	14-12GW	SWSW	12	49N	76W	WYW012943
91	SPU 1 & 2	23-12BG	NESW	12	49N	76W	WYW012944A
92	SPU 1 & 2	23-12LW	NESW	12	49N	76W	WYW012944A
93	SPU 1 & 2	32-12BG	SWNE	12	49N	76W	WYW012944
94	SPU 1 & 2	32-12LW	SWNE	12	49N	76W	WYW012944
95	SPU 1 & 2	34-12BG	SWSE	12	49N	76W	WYW012944

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
96	SPU 1 & 2	34-12LW	SWSE	12	49N	76W	WYW012944
97	SPU 1 & 2	41-12BG	NENE	12	49N	76W	WYW012944
98	SPU 1 & 2	41-12LW	NENE	12	49N	76W	WYW012944
99	SPU 1 & 2	43-12BG	NESE	12	49N	76W	WYW012944
100	SPU 1 & 2	43-12GW	NESE	12	49N	76W	WYW012944
101	SPU 1 & 2	14-13BG	SWSW	13	49N	76W	WYW023996
102	SPU 1 & 2	14-13GW	SWSW	13	49N	76W	WYW023996
103	SPU 1 & 2	34-13BG	SWSE	13	49N	76W	WYW023996
104	SPU 1 & 2	34-13GW	SWSE	13	49N	76W	WYW023996
105	SPU 1 & 2	11-14BG	NWNW	14	49N	76W	WYW138444
106	SPU 1 & 2	11-14GW	NWNW	14	49N	76W	WYW138444
107	SPU 1 & 2	12-14BG	SWNW	14	49N	76W	WYW138444
108	SPU 1 & 2	12-14GW	SWNW	14	49N	76W	WYW138444
109	SPU 1 & 2	14-14BG	SWSW	14	49N	76W	WYW0161144
110	SPU 1 & 2	14-14GW	SWSW	14	49N	76W	WYW0161144
111	SPU 1 & 2	21-14BG	NENW	14	49N	76W	WYW138444
112	SPU 1 & 2	21-14GW	NENW	14	49N	76W	WYW138444
113	SPU 1 & 2	R/23-14BG	NESW	14	49N	76W	WYW161144
114	SPU 1 & 2	R/23-14GW	NESW	14	49N	76W	WYW161144
115	SPU 1 & 2	32-14BG	SWNE	14	49N	76W	WYW138444
116	SPU 1 & 2	32-14GW	SWNE	14	49N	76W	WYW138444
117	SPU 1 & 2	34-14BG	SWSE	14	49N	76W	WYW0161144
118	SPU 1 & 2	34-14GW	SWSE	14	49N	76W	WYW0161144
119	SPU 1 & 2	42-14BG	SENE	14	49N	76W	WYW138444
120	SPU 1 & 2	42-14GW	SENE	14	49N	76W	WYW138444
121	SPU 1 & 2	R/43-14BG	NESE	14	49N	76W	WYW0161144
122	SPU 1 & 2	R/43-14GW	NESE	14	49N	76W	WYW0161144
123	SPU 1 & 2	12-15BG	SWNW	15	49N	76W	WYW153071
124	SPU 1 & 2	12-15GW	SWNW	15	49N	76W	WYW153071
125	SPU 1 & 2	13-15BG	NWSW	15	49N	76W	WYW153071
126	SPU 1 & 2	13-15GW	NWSW	15	49N	76W	WYW153071
127	SPU 1 & 2	21-15BG	NENW	15	49N	76W	WYW153071
128	SPU 1 & 2	21-15GW	NENW	15	49N	76W	WYW153071
129	SPU 1 & 2	23-15BG	NESW	15	49N	76W	WYW153071
130	SPU 1 & 2	23-15GW	NESW	15	49N	76W	WYW153071
131	SPU 1 & 2	32-15BG	SWNE	15	49N	76W	WYW153071
132	SPU 1 & 2	32-15GW	SWNE	15	49N	76W	WYW153071
133	SPU 1 & 2	34-15BG	SWSE	15	49N	76W	WYW153071
134	SPU 1 & 2	34-15GW	SWSE	15	49N	76W	WYW153071
135	SPU 1 & 2	41-15BG	NENE	15	49N	76W	WYW153071
136	SPU 1 & 2	41-15GW	NENE	15	49N	76W	WYW153071
137	SPU 1 & 2	43-15BG	NESE	15	49N	76W	WYW153071
138	SPU 1 & 2	43-15GW	NESE	15	49N	76W	WYW153071
139	SPU 1 & 2	32-22BG	SWNE	22	49N	76W	WYW153071
140	SPU 1 & 2	32-22GW	SWNE	22	49N	76W	WYW153071
141	SPU 1 & 2	41-22BG	NENE	22	49N	76W	WYW153071
142	SPU 1 & 2	41-22GW	NENE	22	49N	76W	WYW153071

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease
143	SPU 1 & 2	12-23BG	SWNW	23	49N	76W	WYW0161144
144	SPU 1 & 2	12-23GW	SWNW	23	49N	76W	WYW0161144
145	SPU 1 & 2	21-23BG	NENW	23	49N	76W	WYW138444
146	SPU 1 & 2	21-23GW	NENW	23	49N	76W	WYW138444
147	SPU 1 & 2	32-23BG	SWNE	23	49N	76W	WYW138444
148	SPU 1 & 2	32-23GW	SWNE	23	49N	76W	WYW138444
149	SPU 1 & 2	34-23BG	SWSE	23	49N	76W	WYW0161144
150	SPU 1 & 2	34-23GW	SWSE	23	49N	76W	WYW0161144
151	SPU 1 & 2	41-23BG	NENE	23	49N	76W	WYW138444
152	SPU 1 & 2	41-23GW	NENE	23	49N	76W	WYW138444
153	SPU 1 & 2	43-23BG	NESE	23	49N	76W	WYW0161144
154	SPU 1 & 2	43-23GW	NESE	23	49N	76W	WYW0161144
155	SPU 1 & 2	14-24BG	SWSW	24	49N	76W	WYW0161144
156	SPU 1 & 2	14-24GW	SWSW	24	49N	76W	WYW0161144
157	SPU 1 & 2	23-24BG	NESW	24	49N	76W	WYW023996
158	SPU 1 & 2	23-24GW	NESW	24	49N	76W	WYW023996
159	SPU 1 & 2	34-24BG	SWSE	24	49N	76W	WYW023996
160	SPU 1 & 2	34-24GW	SWSE	24	49N	76W	WYW023996
161	SPU 1 & 2	43-24BG	NESE	24	49N	76W	WYW023996
162	SPU 1 & 2	43-24GW	NESE	24	49N	76W	WYW023996
163	SPU 1 & 2	23-13BG	NESW	13	49N	76W	WYW023996
164	SPU 1 & 2	23-13GW	NESW	13	49N	76W	WYW023996
165	SPU 1 & 2 BELUS	14-17BG	SWSW	17	49N	75W	WYW027956C
166	SPU 1 & 2 49 RANCH	14-30BG	SWSW	30	49N	75W	WYW134226
167	SPU 1 & 2 49 RANCH	14-30GW	SWSW	30	49N	75W	WYW134226
168	SPU 1 & 2 BELUS	14-17GW	SWSW	17	49N	75W	WYW027956C
169	SPU 1 & 2 J RECORD	14-7BG*	SWSW	7	49N	75W	WYW027956C
170	SPU 1 & 2 J RECORD	14-7GW	SWSW	7	49N	75W	WYW027956C
171	SPU 1 & 2 J RECORD	23-7BG	NESW	7	49N	75W	WYW135913
172	SPU 1 & 2 J RECORD	23-7GW	NESW	7	49N	75W	WYW135913
173	SPU 1 & 2 RECORD	21-13BG	NENW	13	49N	76W	WYW040493A
174	SPU 1 & 2 RECORD	21-13GW	NENW	13	49N	76W	WYW040493A
175	SPU 1 & 2 RECORD	22-13BG	SENW	13	49N	76W	WYW040493A
176	SPU 1 & 2 RECORD	22-13GW	SENW	13	49N	76W	WYW040493A
177	SPU 1 & 2 RECORD	32-13BG	SWNE	13	49N	76W	WYW040493
178	SPU 1 & 2 RECORD	32-13GW	SWNE	13	49N	76W	WYW040493
179	SPU 1 & 2 RECORD	41-13BG	NENE	13	49N	76W	WYW040493
180	SPU 1 & 2 RECORD	41-13GW	NENE	13	49N	76W	WYW040493
181	SPU 1 & 2 RECORD	12-24BG	SWNW	24	49N	76W	WYW040493
182	SPU 1 & 2 RECORD	12-24GW	SWNW	24	49N	76W	WYW040493
183	SPU 1 & 2 RECORD	21-24BG	NENW	24	49N	76W	WYW040493
184	SPU 1 & 2 RECORD	21-24GW	NENW	24	49N	76W	WYW040493
185	SPU 1 & 2 RECORD	32-24BG	SWNE	24	49N	76W	WYW040493
186	SPU 1 & 2 RECORD	32-24GW	SWNE	24	49N	76W	WYW040493
187	SPU 1 & 2 RECORD	41-24BG	NENE	24	49N	76W	WYW040493
188	SPU 1 & 2 RECORD	41-24GW	NENE	24	49N	76W	WYW040493

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

	IMPOUNDMENT Name / Number	Qtr/Qtr	Sec	TWP	RNG	Capacity (Acre Feet)	Surface Disturb (Acres)	Lease #
1	CRICKET	SENW	2	49	76	2.2	1	FEE
2	WIDE TOP	SENW	2	49	76	4.4	1.5	FEE
3	GRASSY FLAT	SENE	3	49	76	8.1	2.5	WYW033136
4	ALL THE WAY	NWNE	11	49	76	1.7	1	WYW0012943
5	MIDWAY	SENE	11	49	76	3.75	1	WYW033136
6	CRESCENT	NWNE	13	49	76	10.01	1.5	WYW0040493 A
7	ANTELOPE	SESW	34	50	76	4.85	1.5	WYW033138
8	LANEY	SESW	34	50	76	5.05	1.5	WYW033136
9	BESSIE HOLMS	SESE	34	50	76	4.75	1.5	WYW033138
10	RECORD 12-3-4976	SWNW	3	49	76	24.29	4	FEE
11	RECORD 32-11-4976	SWNE	11	49	76	31.22	5.5	WYW0012943
12	RECORD 42-11-4976	SENE	11	49	76	36.61	6	WYW0012943
13	RECORD 41-12-4976	NENE	12	49	76	39.37	6.5	WYW0012944
14	RECORD 42-13-4976	SENE	13	49	76	47.26	6.5	FEE
15	RECORD 22-18-4975	SENW	18	49	75	31.44	4.5	WYW0157205
16	ANT HILL	SWSW	28	49	75	8.55	2.5	WYW0013596
17	WATERHOLE #2	NWNW	33	49	75	13.5	4	WYW0013598
18	WATERHOLE #1	NWNW	33	49	75	14.6	4.5	WYW0013598
19	Williams 14-28-4975—Added Post Onsite	SWSW	28	49	75	73.5	7	WYW0013598

County: Campbell

Applicant: Williams Production RMT

Surface Owners: Record TJ Ranch Limited Partnership, 49 Ranch, Blue Butte Ranch

Project Description:
The proposed action involves the following:

- Drilling of 188 total federal CBM wells. The targeted coal zones range from 1053 to 1590 feet below ground surface for the Big George, 1641 to 2204 for the Wall, and 2236 to 2400 for the lower Wall.

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

- Well metering shall be accomplished by using telecommunications. Gas measurement will occur at individual wellheads with approximately 4 visits per month to each well.

- A Water Management Plan (WMP) that involves the following infrastructure and strategy: 19 proposed and exisiting descharge points and reservoirs within the Upper Powder River watershed. In addition, water in excess of storage capacity will be transported to a facility on the Powder River for treatment and discharge, to other reservoirs within the South Prong Unit and the Schoonover Road Unit (SRU), or transported via Anadarko's pipeline to a deep injection site near Midwest, WY (CDU/SPU/SRU EA# WY-070-08-013). All water from the Laskie Draw portion of this project will be transported for treatment and discharge or to Midwest for deep injection. Two of the proposed dams are listed as secondary.

- An unimproved and improved road network.

- An above ground power line network will be constructed by a third party power supplier. The proposed route has been reviewed by the power supplier however the route could be changed by the power supplier without the informed consent of the operator.

- The operator has proposed 23 power drops. If the locations of the power drops are altered, the operator will submit power drop changes and any known overhead power re-routes by sundry. Power line construction will not be completed before the CBNG wells are producing. Temporary diesel generators have been proposed to be placed at the power drops. A storage tank of 1,000 gallon capacity shall be located with each diesel generator. Generators are projected to be in operation for 6-12 months. Fuel deliveries are anticipated to be 2 times per week. Noise level is expected to be between 82 decibels at distances between 50 feet.

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

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

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

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

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

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

2.3. Alternative C – Environmentally Preferred

Alternative C represents a modification of Alternative B based on the operator and BLM working cooperatively to reduce environmental impacts. The description of Alternative C is the same as Alternative B with the addition of the project modifications identified by BLM and the operator following the initial project proposal (Alternative B). At the on-sites, all areas of proposed surface disturbance were inspected to insure that the project would meet BLM multiple use objectives to conserve natural resources while allowing for the extraction of Federal minerals.

In some cases, access roads were re-routed, and well locations, pipelines, discharge points and other water management control structures were moved, modified, mitigated or dropped from further consideration to alleviate environmental impacts. Alternatives to the different aspects of the proposed action are always considered and applied as pre-approval changes, site specific mitigation and/or Conditions of Approval (COAs), if they will alleviate environmental effects of the operator's proposal. Due to steep topography, fragile soils and wildlife issues, out of the original 188 APDs proposed, 1APD was added and 6 APDs were withdrawn, leaving 183 APDs total for the South Prong Unit 1&2 and Laskie PODs. Impoundments were also added and dropped, the originally proposal was for 19 impoundments, the proposal was reduced to 10 impoundments. The specific changes identified in the following tables and are listed below under 2.3.1:

Summary of Applications Added and Withdrawn

APD Added	49N	76W	9	22-9GW	SENW	LASKIE DRAW SPU	WYW153071
APD Withdrawn	49N	76W	4	14-4GW*	SWSW	LASKIE DRAW SPU	WYW33136
APD Withdrawn	49N	76W	4	34-4GW	SWSE	LASKIE DRAW SPU	WYW33136
APD Withdrawn	49N	76W	4	41-4BG	NENE	SPU 1 & 2	WYW33136
APD Withdrawn	49N	76W	4	41-4LW	NENE	SPU 1 & 2	WYW33136
APD Withdrawn	49N	76W	1	23-1BG	NESW	SPU 1 & 2	WYW012943
APD Withdrawn	49N	76W	1	23-1GW	NESW	SPU 1 & 2	WYW012943

Summary of Impoundments Added and Withdrawn

Withdrawn	CRICKET	SENW	2	49	76
Withdrawn	ALL THE WAY	NWNE	11	49	76
Withdrawn	MIDWAY	SENE	11	49	76
Withdrawn	CRESCENT	NWNE	13	49	76
Withdrawn	ANTELOPE	SESW	34	50	76
Withdrawn	RECORD 41-12-4976	NENE	12	49	76
Withdrawn	ANT HILL	SWSW	28	49	75
Withdrawn	WATERHOLE #2	NWNW	33	49	75
Withdrawn	WATERHOLE #1	NWNW	33	49	75
Added to replace the Anthill and Waterhole #1 and 2 above	WILLIAMS 14-28-4975	SWSW	28	49	75

2.3.1. Changes as a result of the on-sites

SPU 1 & 2 POD

Master Surface Use Plan

1. Redesigned pads and rounded pad corners on the following locations; 21-19, 43-19, 22-13, 32-12, 23-15, 34-11, 14-12, 12-14, 23-11, 12-1, 41-22, 12-23, 23-24
2. Moved the 23-14 location closer to the access road to reduce disturbance, this changed the well number to the 13-14, due to the numbering system for gas wells.
3. Relocated the 32-14 away from a petrified tree and sand blow out.
4. Relocated the 41-12 location toward a dam of nearby reservoir and reduced corridor disturbance width to 20 ft due to sage-grouse habitat.
5. Relocated the 12-15 to corridor disturbance with an existing road and pipeline to the north.
6. Repositioned the 32-13 wells to fit the reserve pit on the constructed pad without disturbing the cut slope of the previously plugged and abandoned conventional oil well pad.
7. Relocated the 43-11, this minimized disturbance by avoiding a constructed pad.
8. To reduce disturbance, recommended a corridor for overhead power with road corridor near the 43-11 well site.
9. Reduced disturbance at the 41-13 location by moving wells toward the access road and shrinking pad.
10. Moved the 34-24, surface owner requested the move to utilize old conventional well pad to store ranch equipment.
11. Relocated the 21-15, 14-10, and 12-18 locations a safe distance away from a newly constructed Western Gas line.
12. Relocated the 12-10 to reduce the size of the constructed pad.
13. Rerouted the access from the 12-10 to the 14-10 to reduce disturbance.
14. Relocated the 12-1, moved uphill and to the south to reduce disturbance.
15. For safety of the drilling rig, due to slope, recommended enlarging the disturbance area on the 41-24 from a small slotted pad to a constructed pad.
16. Moved the 34-14 closer to the existing disturbance of the Western Gas line.
17. Relocated the access road to the 42-14 location up to the ridge to avoid snow drifts in this area.
18. Relocated the 21-13 to avoid a constructed pad.
19. Due to steep topography, sensitive soils and/or visual impacts, detailed plans for expedient reclamation were requested for the 13-15, 41-22, 12-23 sites.

Visual Resources

1. Due to visual resources, the operator will corridor the road and pipeline for the 32-22 location with the disturbance from the newly constructed Western Gas Line.
2. Relocated the 14-30 approximately 200 ft north out of view of Interstate 90. Access road also moved north, off ridge and to less visible location.
3. To eliminate a constructed pad and mitigate visual impact from I-90, the 43-23 well was moved approximately 240 ft west and it was decided 4 ft tall well housing will be used in place of the usual 6 ft tall boxes.
4. To mitigate the visual impact from I-90 Williams will also use a 4 ft well housing on the 14-24 site.

Water Management

1. Anthill, Waterhole #1 and Waterhole #2 dams were dropped in favor of one large (Safety of Dams category) structure, the Williams 14-28-4975 Dam.
2. The Record 41-12 impoundment was dropped because of concerns for sage-grouse habitat.
3. Antelope and Cricket dams were dropped because of seepage downstream. The operator agreed to drain and line the remaining dams of these pairs, Laney and Wide Top, to curtail further seepage into their respective drainages.

4. Three other dams, All The Way, Midway and Crescent, were dropped by the operator prior to the onsite.

Wildlife

1. Relocated the 32-11 approximately 370' due to sage-grouse nesting habitat.
2. Relocated the 23-7 approximately 150' east toward an existing pipeline due to sage-grouse nesting habitat.
3. Recommend dropping the 41-4 location and access due to quality sage-grouse nesting habitat.
4. Due to sage grouse habitat, 1/2 mile of pipeline going from the 23-19 was placed in a corridor with the access road.
5. The onsite participants agreed to drop 43-14 location due to raptor nests.
6. Discussed restriction of visitation and maintenance on the 43-15 depending on further wildlife information.
7. BLM wildlife biologist recommended moving the 14-17 well location 200' west due to sage-grouse nesting habitat. Williams stated move was not acceptable.
8. Use 4 ft box for the 43-1. Restricted well site visitation to mid-day. Activity at this location other than checking the well March 1-June 15 will require an exception.
9. Move power drop onto the 14-7 location.
10. Moved the 22-20 approx 200 ft north due to raptor nest and sage-grouse habitat.
11. Recommended a corridor for overhead power with road corridor near the 21-23 location.
12. Activity at 24-1 location other than checking the well March 1-June 15 will require an exception to wildlife timing limitations.
13. Operator will bury power to 12-1 location.
14. 12-2 access and well in quality nesting habitat. Moved the 12-2 location south toward road.
15. Dropping 23-1 well, within ¼ mile of lek.
16. Recommend bury proposed power within ½ mile of leks.
17. Relocated the 14-13 out of sight of a raptor nest and minimized corridor to 20 feet.

Laskie POD

Master Surface Use Plan

1. Moved the 43-4 location approximately 25 ft to get it safely away from the main road.
2. Relocated the 23-9 west, due to topography and sagebrush. The move also eliminated portions of the access road reducing linear disturbance as well.

Wildlife

3. Williams initially proposed four wells (14-4, 23-4, 34-4, & 21-9) on the quarter- mile controlled surface use line for the Laskie Draw sage-grouse lek. BLM recommended these four wells be moved or dropped.
   a) The 21-9 was moved east adjacent to an existing road. Williams will restrict well site visitation to mid-day. Activity at this location other than checking the well March 1-June 15 will require an exception.
   b) The 14-4 and 34-4 were dropped.
   c) The 23-4 was kept in the original location with Williams agreeing to additional mitigation such as limiting well height to four feet, seeding an old road, minimizing sagebrush mowing, and limiting corridor width.
4. The 34-9 was moved southwest to an eyebrow location just off the access road due to sage-grouse nesting habitat.
5. Due to sage-grouse habitat moved the 41-9 to the east of the access road to an eyebrow location.
6. Due to an unreported red-tailed hawk nest, the 12-9 was moved south.

Engineered Roads

1. Improved road plans were requested to access the following well locations 12-14, 42-14, 23-15, 13-15, 41-22, and 12-1.

2.3.2. Programmatic mitigation measures identified in the PRB FEIS ROD

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

2.3.2.1. Groundwater

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed and revised a guidance document, "Compliance Monitoring and siting Requirements for Unlined Impoundments Containing Coalbed Methane Produced Water" (September, 2006) which can be accessed on their website. For all WYPDES permits the BLM will require that operators comply with the latest DEQ standards and monitoring guidance.

2.3.2.2. Surface Water

1. Channel Crossings:
   a) 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.
   b) 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. The operator will supply copies of complete approved SW-4, SW-3, or SW-CBNG permits to BLM as they are issued by WSEO for impoundments.

4. The operator will supply copies of complete approved WYPDES permits and modifications as they are issued by WDEQ.

2.3.2.3. Soils

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

2.3.2.4. 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

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. The Companies will locate aboveground power lines, where practical, at least 0.5 mile from any sage grouse breeding or nesting grounds to prevent raptor predation and sage grouse collision with the conductors. Power poles within 0.5 mile of any sage grouse breeding ground will be raptor-proofed to prevent raptors from perching on the poles.

5. 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.

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

2.3.2.5. Visual Resources

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

2.3.2.6. 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.

2.3.2.7. 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

Surface Use

1. All changes made at the onsite will be followed. They have all been incorporated into the operator's plan of development.

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 SPU 1& 2 and Laskie POD is Covert Green 18-0617 TPX.
3. The operator has proposed power drops on maps. If the locations of the power drops or power line route are altered, the operator will request the changes by sundry.
4. Keep sediment out of drainage near the 12-23 location by using methods such as silt fencing.
5. Retain a 20ft vegetated border from edge of disturbance of the 34-14 to nearby drainage.
6. Proposed disturbance areas with limited reclamation potential shall be stabilized in a manner which eliminates accelerated erosion until a self-perpetuating non-weed, native plant community has stabilized the site in accordance with the Wyoming Reclamation Policy. Stabilization efforts shall be finished within 30 days of the initiation of construction activities for well locations: 13-15-4979, 41-22-4976, and 12-23-4976 and roads and pipelines with low reclamation potential as identified on the Reclamation Map for the Laskie and SPU 1 & 2 PODs (attachment 1).
7. The operator will follow the guidance provided in the Wyoming Policy on Reclamation (IM WY-90-231) specifically the following:
   Reclamation Standards:
   C. 3 The reclaimed area shall be stable and exhibit none of the following characteristics:
   a. Large rills or gullies.
   b. Perceptible soil movement or head cutting in drainages.
   c. Slope instability on, or adjacent to, the reclaimed area in question.
   C.4. The soil surface must be stable and have adequate surface roughness to reduce runoff and capture rainfall and snow melt. Additional short-term measures, such as the application of mulch, shall be used to reduce surface soil movement.
   C.5. Vegetation canopy cover (on unforested sites), production and species diversity (including shrubs) shall approximate the surrounding undisturbed area. The vegetation shall stabilize the site and support the planned post disturbance land use, provide for natural plant community succession and development, and be capable of renewing itself. This shall be demonstrated by:
   a. Successful onsite establishment of species included in the planting mixture or other desirable species.
   b. Evidence of vegetation reproduction, either spreading by rhizomatous species or seed production.
   C.6. The reclaimed landscape shall have characteristics that approximate the visual quality of the adjacent area with regard to location, scale, shape, color and orientation of major landscape features and meet the needs of the planned post disturbance land use.

8. 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 loss. 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:

Species - *Cultivar*	**% in Mix**	**Lbs PLS**
Western Wheatgrass - *Rosana*	30	3.6
Bluebunch Wheatgrass – *Secar or P-7*	10	1.2
Green needlegrass - *Lodorm*	25	3.0
Slender Wheatgrass	20	2.4

Species - *Cultivar*	% in Mix	Lbs PLS
White – *Antelope* or Purple Prairie Clover – *Bismarck*	5	0.6
Prairie coneflower	5	0.6
Rocky Mountain beeplant	5	0.6
Totals	100%	12 lbs/acre

This is a recommended seed mix based on the native plant species listed in the NRCS Ecological Site descriptions, U.W. College of Ag. and seed market availability.

9. Please contact Jennifer Spegon Natural Resource Specialist, @ (307) 684-1059 Bureau of Land Management, Buffalo, if there are any questions concerning these surface use COAs.

Wildlife

Mountain Plover

1. A mountain plover nesting survey is required in prairie dog colonies in section 1, 4, and 23, (T49N, R76W) prior to commencement of surface disturbing within 0.25 miles of those colonies. No surface disturbing activities are permitted in suitable habitat areas listed above, from March 15-July 31, until a mountain plover nesting survey has been conducted for the current breeding season. This affects all wells and their associated infrastructure and reservoirs located within 0.25 miles of a prairie dog colony.
   a. If a mountain plover is identified, then a seasonal disturbance-free buffer of 0.25 mile shall be maintained between March 15 and July 31. If no mountain plovers are identified, then surface disturbing activities may be permitted within suitable habitat until the following breeding season (March 15).
   b. 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.
   c. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.

Burrowing Owl

1. No surface disturbing activity shall occur the within the black-tailed prairie dog colonies listed in the 2007 wildlife reports (WLS 2007) from April 15 through August 31, annually, prior to a burrowing owl nest occupancy survey for the current breeding season. This will affect all wells their associated infrastructure and reservoirs within 0.25 miles of a prairie dog colony.

Raptors

1. The following conditions will alleviate impacts to raptors:
   a. No surface disturbing activity shall occur within 0.5 mile of all identified raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation will affect the following:

BLM ID	SPECIES	UTM E	UTM N	SCTN	TWP	RNG	SUBSTRATE	Wells and associated infrastructure:

BLM ID	SPECIES	UTM E	UTM N	SCTN	TWP	RNG	SUBSTRATE	Wells and associated infrastructure:
648	Golden eagle	424112	4893262	25	49	76	Cottonwood	
1376	Golden eagle	419564	4895227	21	49	76	Cottonwood	
1381	Red-tailed hawk	420816	4894841	22	49	76	Cottonwood	
2676	Golden eagle	419545	4895372	21	49	76	Cottonwood	
2677	Red-tailed hawk	420881	4894915	22	49	76	Cottonwood	
2682	Red-tailed hawk	421640	4894520	22	49	76	Cottonwood	
2683	Unknown	419727	4894308	28	49	76	Cottonwood	
2685	American Kestrel	419749	4895478	21	49	76	Cliff	
3546	Red-tailed hawk	427407	4899584	5	49	75	Creek bank	
3547	Long-eared owl	427702	4898574	8	49	75	Juniper	
3548	Red-tailed hawk	425908	4897339	18	49	75	Cottonwood	41-13, 14-7, 23-7, 12-18
3549	Red-tailed hawk	426157	4897658	7	49	75	Cottonwood	41-13, 14-7, 23-7, 12-18
3639	Unknown	420448	4894114	27	49	76	Cottonwood	
3812	Unknown	422751	4893918	26	49	76	Cottonwood	34-23
3813	Red-tailed hawk	422650	4893509	26	49	76	Cottonwood	
3814	Golden eagle	424204	4893159	25	49	76	Cottonwood	
3815	Unknown	422677	4894060	26	49	76	Cottonwood	34-23
3816	Unknown	422943	4893884	26	49	76	Cottonwood	34-23
3817	Red-tailed hawk	422956	4893937	26	49	76	Cottonwood	34-23
3818	Unknown	422818	4894173	26	49	76	Cottonwood	34-23
3820	Red-tailed hawk	420812	4895010	22	49	76	Cottonwood	34-23
3821	Red-tailed hawk	424469	4892314	36	49	76	Cottonwood	
4149	Unknown	427398	4898771	8	49	75	JUL	
4277	Unknown	426110	4897586	8	49	75	Cottonwood	new 31-18, 41-18
5077	Red-tailed hawk	427468	4895697	20	49	75	Cottonwood	14-17, 22-20, 12-20
5078	Great-horned owl	425890	4895920	19	49	75	Cottonwood	21-19, 32-19, 41-19, 12-19,
5079	Red-tailed hawk	425433	4896191	18	49	75	Cottonwood	41-24, 21-19
5080	Red-tailed hawk	423592	4896416	14	49	76	Cottonwood	23-13, 14-13, 34-14, 41-23, 42-14

BLM ID	SPECIES	UTM E	UTM N	SCTN	TWP	RNG	SUBSTRATE	Wells and associated infrastructure:
5081	Red-tailed hawk	423400	4896480	14	49	76	Cottonwood	32-14, 14-13, 41-23, 34-14, 42-14, 34-14
5103	Unknown	419127	4895877	21	49	76	Cottonwood	
5429	Red-tailed hawk	421834	4896925	15	49	76	Cottonwood	12-14, **43-15**, 32-15,
5585	Golden eagle	420938	4899566	3	49	76	Ponderosa	21-10, 43-4, 41-9,
5590	Great-horned owl	420454	4896366	15	49	76	Juniper	13-15
5586	Unknown	425743	4892909	30	49	75	Cottonwood	
5587	Red-tailed hawk	419870	4901280	33	50	76	Cottonwood	
5591	Red-tailed hawk	418853	4898613	9	49	76	Ponderosa	12-9

Note: All nests requiring nest occupancy and productivity checks are included in the table. Timing limitations currently apply only to those nests with infrastructure identified within 0-.5 miles.

1) Surveys to document nest occupancy at the above nests shall be conducted by a biologist following BLM protocol, between April 15 and June 30. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a 0.5 mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within 0.5 mile of occupied raptor nests from February 1 to July 31.
2) Nest productivity checks shall be completed for five years. 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.
3) Activities at the 43-15 well location will be limited to routine well visits February 1-July 31. Should the well or corridor need maintenance, the BLM will be notified of the work needed and nest status. If the nest is active, a biological monitor shall be present for the duration of work and submit a report to the BLM within two days of work completion. Routine well visits would include pumper traffic and metering. Maintenance would include use of any internal combustion engine or an activity outside the well-house that requires more than one person/hour.

Sage-grouse

1. No surface disturbing activities are permitted within 2 miles of the following sage-grouse leks: Laskie Draw, Laskie Draw East, Barber Creek/South Prong, and Watsabaugh 4 between March 1 and June 15, prior to completion of a greater sage-grouse lek survey. This timing limitation will apply to the wells, infrastructure and water management as depicted in the Laskie (June 23, 2008) and South Prong 1&2 (June 9, 2008) Williams' Map D with wildlife. Seventy-two of the 100 well locations and all water management (except Section 28 (T49N,R75W)) in the project area are covered by this condition.
   a. If an active sage grouse 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.

b. Creation of raptor hunting perches will be avoided within 0.5 mile of documented sage grouse and sharp-tailed grouse lek sites. Perch inhibitors will be installed on well houses, fencing, panels or other structures over 4-feet tall to deter avian predators from preying on sage grouse.
c. Vehicle traffic within ¼ mile of leks shall be limited from 9 AM to 3PM from March 1-June 15.

2. If during the greater-sage grouse lek survey a new sharp-tailed grouse lek is identified, a 0.67 mile timing restriction (April 1 to May 31) 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 buffer until the following breeding season. The required 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.
3. Minimize mowing on access roads and locations in sagebrush, in particular: the 23-4, 34-14, 32-23, and the 41-23 locations. For example, whenever possible drive on the sagebrush instead of mowing or blading it.
4. Due to sage-grouse nesting habitat, the operator will contain corridor (road and pipeline) disturbance (mowed or bladed vegetation and 2-track) within 20 ft at the following locations: 23-4, 21-10, 34-19, 32-12, 14-7, 24-1, 22-1, and from the 12-20 location to the 43-19 location.
5. Due to 23-4 located at ¼ mile and in view of a sage grouse lek, Williams will use 4 ft well housing on the 23-4 location.
6. Seed the old ranch road south of the 23-4 location.

Water Management

1. The BLM will be notified at least 2 weeks prior to beginning construction of the Williams 14-28-4975 Dam. A pre-construction review will be conducted no more than 5 days prior to the commencement of construction activities. If this dam is downsized to be less than Safety of Dams category prior to construction, then the following conditions will apply:
   a. Geotechnical investigations for foundation and substrate will be conducted by a qualified engineer.
   b. The dam's construction will be closely supervised by a qualified engineering firm to guarantee that all construction specifications are closely adhered to.
2. Laney and Wide Top dams will be drained and lined with an impervious material (not specifically identified) to prevent these dams' reservoirs from seeping into their respective drainages. Should seepage continue following two years of operation after lining has been completed, all discharge of water produced from federal actions will be discontinued. Should the landowner concur, these two dams and their reservoirs will then be decommissioned and reclaimed according to BLM reclamation standards for final abandonment of CBNG storage impoundments (in process of being developed). If the landowner chooses to retain these two dams and reservoirs, no water produced as a result of any federal action will be discharged to them.
3. The operator's water management plan specifically states that "…no produced effluent will be allowed to flow from the containment facilities…" With this in mind, if the operator chooses to petition the WDEQ for a change in their WYPDES permits to allow the use of assimilative capacity credits with this POD, a sundry to change the water management plan and allow discharge will be submitted to the BLM for review, additional analysis, and approval prior to beginning discharge.
4. The spring identified in the NENW of section 20, T49N, R75W, will be monitored, and, if flow is present, flow will be measured and samples will be collected and analyzed in the spring and in the fall.

5. When impoundments listed as "Secondary" are to be added, a sundry will first be submitted to the BLM's Buffalo Field Office for review and additional analysis, if needed. Reclamation bonding for any additional impoundments will be in place prior to sundry approval.

Cultural

1. According to the cultural resource addendum report (Fewings – WLS, 2008a), several areas were identified to have less than adequate surface visibility for locating cultural resources. BLM Manual 8110 .21 (C) 3, states that "areas with dense vegetation cover, partial snow cover, dune activity, or other surface obscuring conditions may require further survey as these conditions change". Therefore, the following areas will not be approved until they receive an adequate class III cultural resource inventory as surface visibility allows. If surface visibility has not increased as the vegetation dries out, a shovel testing/probing inventory must be conducted. A testing strategy must be approved by the BLM archaeologist prior to the inventory.

12-10-4976 well: center of survey block, as well as road and pipeline corridor
13-14-4976 well: center of survey block
12-15-4976 well: drainage bottoms in survey block
41-15-4976 well: southeast corner of survey block
43-23-4976 well: north and west sides of survey block
21-23-4976 well: east end of linear survey
Proposed pipeline in T49N T76W Section 23 SW SE: entire linear corridor

2. An addendum report to document the additional inventory is required. Once the report is reviewed and consultation with SHPO is complete, construction in these areas will be allowed.

Visual Resources

1. To reduce visual impact there will be a condition of approval (COA) to avoid surfacing the access road to the 34-23 location and keep the crosscut on ridge to less than 35 ft.
2. To mitigate the visual impact from I-90, Williams will use a 4 ft well housing on the 43-1 and the 14-24 sites.
3. To mitigate visual impact from I-90, the 34-9 and the 14-9 well structures will be kept below the ridge. Avoid surfacing access road to these well to further reduce visual impact.

2.4. Alternatives considered but not analyzed in detail

The operator did not address alternative strategies.

2.5. Summary of Alternatives

A summary of the infrastructure currently existing within the project area (Alternative A), the infrastructure originally proposed by the operator (Alternative B), and the infrastructure within the BLM/operator modified proposal (Alternative C) are presented in Table 2.5.

Table 2.5 Summary of the Alternatives

Alternative A (No Action) Existing Number or Miles	Facility	Alternative B (Original Proposal) Proposed Number or Miles	Alternative C (Environmental Alt.) Revised Number or Miles
88 Total Wells 27 Plugged Wells	Existing Locations	88	88
9 Injection Wells	Proposed twin wells	188	183
20 Gas Shut In Wells	Nonconstructed Pads	69	68
21 Producing Gas Wells	Slotted Pads	1	1
11 Producing Oil Wells	Constructed Pads	30	31
2 1 Inside POD boundary	Gather/Metering Facilities	0	0
1 Comp. in POD 2 Pump Stations	Compressors	0	0
1	Monitor Wells	0	0
	Impoundments		
4	On-channel	19	10
0	Off-channel	0	0
4	Water Discharge Points	19	10
0	Treatment Facilities	1	1
	Improved Roads		
	No Corridor	1.05	1.05
4.07	With Corridor	10.23	10.23
	2-Track Roads		
1.37	No Corridor		0
5.54	With Corridor	7.0	5.78
	Buried Utilities		
	No Corridor	1.36	1.36
1.67	With Corridor	5.01	4.55
10.88	Overhead Powerlines	3.69	3.69
0	Communication Sites	0	0
0	Staging/Storage Areas	0	0
0	Other Disturbance	0	0

3. DESCRIPTION OF AFFECTED ENVIRONMENT

The SPU 1 & 2 POD APDs were received on August 17, 2007. The Laskie POD APDs were received on January 4, 2008. The two PODs are adjacent to one another, with multiple wells located within the same sections, therefore they are being analyzed under one EA. Field inspections for the proposed South Prong Unit 1&2 and Laskie projects with a combined 188 wells were conducted over multiple days in the months of March and April 2008 by the following interdisciplinary team members:

NAME	TITLE	AGENCY	Date
Jennifer Spegon	Natural Resource Specialist	BLM	March 25, 26, 27 April 1, 2, 3, 29
Clint Crago	Archeologist	BLM	March 25, April 3
Ben Adams	Hydrologist	BLM	March 25, April 29
Don Brewer	Wildlife Biologist	BLM	April 1, 2,
Scott Jawors	Wildlife Biologist		April 29
Bill Ostheimer	Wildlife Biologist	BLM	March 25, 26, 27 April 1, 2, 3, 29
Diane Adams	GIS Specialist	BLM	March 25, 26,
Patrick Barker	Project Manager	Western Land Services	March 25, 26, 27 April 1, 2, 3, 29
Peggy Carter	Hydrologist	Williams Production RMT	April 29
Allen Jones	Hydrologist	Western Land Services	March 25, April 29
Allen Aksamit	Wildlife Biologist	Western Land Services	March 25, 26, 27 April 1, 2, 3, 29
Helen Jones	Landowner	Landowner	March 25
Dave Belus	Landowner	Landowner	March 26, 27
Jerry Record	Landowner	Landowner	April 2, 3, 29
Steve Record	Landowner	Landowner	April 2, 3, 29
Mike Record	Landowner	Landowner	April 3, 29
Richard Jarvis	Land Manager	Williams Production RMT	March 25, 26
Randee Jespersen	Land Manager	Williams Production RMT	March 25, 26, 27 April 1, 2, 3, 29
Jim Mobley	Construction	Williams Production RMT	March 25, 26, 27 April 1, 2, 3
Kelly Preut	Drilling	Williams Production RMT	March 25, 26,
Penny Bellah	Regulatory Team Lead	Williams Production RMT	March 25
Rex Lynde	Drilling	Williams Production RMT	March 25, 26, 27 April 1, 2, 3, 29
Jerry Means	Contract Engineer	Magma Engineering and Construction	March 25, 26, 27 April 1, 2, 3, 29
Ralph Demel	Construction	Williams Production RMT	March 25, 26, 27 April 1, 2, 3
Justin Clyde	Construction	Williams Production RMT	March 26
Shireen Walker	Procurement	Williams Production RMT	March 26
Gabe Gill	Drilling	Williams Production RMT	March 25, 26,
Duane Joslyn	Production	Williams Production RMT	March 25, 26, 27 April 1, 2, 3, 29

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

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

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Threatened and Endangered Species	X	Chapter 2 Chapter 3	Chapter 4	Bill Ostheimer
Floodplains	Chapter 5	Chapter 6	X	Ben Adams
Wilderness Values	Chapter 7	Chapter 8	X	Jennifer Spegon
ACECs	Chapter 9	Chapter 10	X	Jennifer Spegon
Water Resources	X	Chapter 11	Chapter 12	Ben Adams
Air Quality	X	Chapter 13	Chapter 14	Jennifer Spegon
Cultural or Historical Values	Chapter 15	Chapter 16	X	Clint Crago
Prime or Unique Farmlands	Chapter 17	Chapter 18	X	Jennifer Spegon
Wild & Scenic Rivers	Chapter 19	Chapter 20	X	Jennifer Spegon
Wetland/Riparian	Chapter 21	Chapter 22	X	Ben Adams
Native American Religious Concerns	Chapter 23	Chapter 24	X	Clint Crago
Hazardous Wastes or Solids	Chapter 25	X	Chapter 26	Jennifer Spegon
Invasive, Nonnative Species	X	Chapter 27	Chapter 28	Jennifer Spegon
Environmental Justice	Chapter 29	Chapter 30	X	Jennifer Spegon

3.1. Topographic Characteristics of Project Area

The project covers an area of approximately 25 square miles. Access to the project includes the Barber Creek County Road which bisects South Prong Unit 1 and 2. I-90 borders the project diagonally on the south. The Laskie and the SPU 1&2 PODs are abutting William's projects that share the same infrastructure. These PODs are being analyzed together. The majority of the project is in rough topography with numerous ridges and deep draws. A small percentage of the project area consists of rolling hills and flats many cut by steep draws. Elevations range from 4200 feet to 4700 feet above sea level. Drainages in the area include the Laskie Draw on the west side, the South Prong of Barber Creek on the eastern portion of the project, Barber Creek is to the north, and Dead Horse Creek is to the south, just on the south side of Interstate 90.

Historic use is ranching. Current land use incorporates ranching with oil and gas production. Existing and newly developed Federal and state CBNG and oil development surrounds the project area with existing infrastructure of all four sides. The exception is approximately 1.5 miles on the north side of the project that has not yet been developed and in the southeast corner there is about 2 miles of undeveloped area between Devon's Mallard POD and I-90. Over the last 5 years, overhead power lines have been erected on three sides of the project. A major gas line from Anadarko Petroleum has been installed in stages over the last 2 years. The gas line parallels I-90 through SPU 1&2. Other surrounding development includes Petro Canada's Wild Turkey and Prima PODs to the southwest; Anadarko's William Draw Unit PODs to the west; Devon's Mallard POD to the east; and Williams' contiguous Carr Draw PODs 6 miles northward and 10 miles of contiguous projects southward with the additional South Prong Units 3 and 5 and multiple Schoonover Road PODs.

3.2. Vegetation & Soils

The dominant soil orders in this Major Land Resource Area (MLRA) are Aridisols and Entisols. Soils have developed in alluvium and residuum derived mainly from the Wasatch Formation. Lithology consists of light to dark yellow and tan siltstone and sandstones with minor coal seams resulting in a wide

variety of surface and subsurface textures. The soils in the area have a mesic soil temperature regime, an aridic soil moisture regime that borders on ustic, and mixed or smectitic mineralogy. They are shallow to very deep, and generally well-drained. Differences in lithology have produced topographic and geomorphic variations in the area. Ridges and hills are often protected by an erosion resistant cap of clinker, terrace gravels or sandstone. Soils within the area are distributed according to primary differences in parent material (both residual and depositional), elevation, moisture, and topographic slope and position.

Soils are generally productive, though varies with texture, slope and other characteristics. Topsoil depths to be salvaged for reclamation range from 0 to 4 inches on ridges to 8+ inches in bottomland. The main soil limitations in the project area include: depth to bedrock, low organic matter content, low water holding capacity, and high erosion potential especially in areas of steep slopes. Many of the soils and landforms of this area present distinct challenges for development. Approximately 43% (5,012 acres) of the area within the boundary of the proposed action contains soil mapping units with a named component identified as being a highly erosive soil, 20% of the area has slopes greater than 25% and 76% (8,890 acres) of the POD area has a poor reclamation potential, making reclamation challenging if not impossible. Areas of highly erosive soils were avoided when drill sites, two-track access routes, and pipeline routes were surveyed and staked in order to reduce the amount of soil loss. The proponent planned their project and the BLM made further recommendations on the onsite to avoid those areas where possible. Disturbances approved within these areas will be mitigated with the required programmatic/standard COA's complimented with a site specific performance based reclamation plans and related COA.

Soils within the project area were identified from the *South Campbell County Survey Area, Wyoming (WY605).* The soil survey was performed by the Natural Resource Conservation Service according to National Cooperative Soil Survey standards. Pertinent information for analysis was obtained from the published soil survey and the National Soils Information System (NASIS) database for the area.
Dominant soil map units are listed in the table below with their individual acreage and percentage of the area within the POD boundary.

Map Unit	Map Unit Name	Acres	Percent
122	Cushman-Cambria loams, 6 to 15 percent slopes	382.2	3%
147	Forkwood-Cushman loams, 6 to 15 percent slopes	800.7	7%
206	Samday-Shingle-Badland complex, 10 to 45 percent slopes	387.4	3%
216	Theedle-Kishona-Shingle loams, 3 to 30 percent slopes	337.2	3%
217	Theedle-Shingle loams, 3 to 30 percent slopes	3791.3	32%
233	Ustic Torriorthents, gullied	4521.4	39%

For more detailed soil information, see the Natural Resources Conservation Service (NRCS) Soil Survey 605 – South Campbell County.

Vegetation
Ecological Site Descriptions are used to provide site and vegetation information needed for resource identification, management and reclamation recommendations. To determine the appropriate Ecological Sites for the area contained within this proposed action, BLM specialists analyzed data from onsite field reconnaissance and NRCS published soil survey soils information. Ecological Sites identified in this project and its associated infrastructure, ranged from loamy to miscellaneous identified as badlands.
The map unit symbols for the soils identified above and the associated ecological sites for the identified soil map unit symbols found within the project boundary are listed in the table below.

Map Unit	Ecological Sites
122	Loamy 10-14" Northern Plains
147	Loamy 10-14" Northern Plains
206	Shallow Clayey“ Northern Plains
216	Loamy 10-14" Northern Plains
217	Loamy 10-14" Northern Plains
233	Badlands

Dominant Ecological Sites and Plant Communities identified in this POD and its infrastructure are loamy and miscellaneous areas described as badlands.

Loamy Sites occur on gently undulating to rolling land on landforms which include hill sides, alluvial fans, ridges and stream terraces, in the 10-14 inch precipitation zone. The soils of this site are moderately deep to deep (greater than 20" to bedrock), well drained soils that formed in alluvium and residuum derived from sandstone and shale. These soils have moderate permeability.

The present plant community is a Mixed Sagebrush/Grass. Wyoming big sagebrush is a significant component of this Mixed Sagebrush/Grass plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. Dominant grasses include bluebunch wheatgrass, rhizomatous wheatgrass, blue grama, and little bluestem. Other grasses occurring on the state include Cusick’s and Sandberg bluegrass, and prairie junegrass. Cheatgrass has invaded the state. Other vegetative species identified at onsite include: pricklypear and fringed sagewort.

“Miscellaneous Areas”, Badlands:
This site occurs on steep slopes and ridge tops, but may occur on all slopes which include landforms such as hillsides, ridges and escarpments. The sites are identified as miscellaneous areas and classified as Badlands. Badlands have essentially no soil and support little or no vegetation. Steep or very steep, commonly non-stony, barren land dissected by many intermittent drainage channels. Badlands are most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.
A summary of the ecological sites within the project area are listed in the table below along with the individual acreage and the percentage of the total area identified within the POD boundary.

Summary of Ecological Sites

Ecological Site	Acres	Percent
Loamy (10-14NP)	6324	54%
Badlands	4521.4	39%
Shallow Clayey (10-14NP)	490.2	4%
Sandy (10-14NP)	179.7	2%
Clayey (10-14NP)	136.5	1%
Sands (10-14NP)	22.2	<1%

3.2.1. Wetlands/Riparian
There are no naturally occurring wetlands or riparian areas within the project boundary.

3.2.2. Invasive Species
Cheatgrass or downy brome (*Bromus tectorum*) and Japanese brome (*B. japonicus*) exist in the project area. These two species are found in high densities and numerous locations throughout NE Wyoming.

Diffuse knapweed and spotted knapweed, state-listed noxious weeds, were indicated as potentially present by a search of inventory maps and databases compiled by the University of Wyoming and modified to reflect local conditions by BLM Range Conservationist and Campbell County Weed and Pest Weed Specialist. Neither knapweed species was listed as present by the proponent. The onsites were conducted in March and April which is too early for new plants; however skeletons from old plants were not observed either.

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

3.3. Wildlife

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

Habitat assessments and wildlife inventories were performed by Western Land Services (WLS 2007a, 2007b, 2007c and 2008). Western Land Services performed surveys for bald eagles roosts, mountain plover, sharp-tailed grouse, greater sage-grouse, raptor nests, and prairie dog colonies and Ute Ladies-tresses' orchid habitat according to Powder River Basin Interagency Working Group (PRB IWG) accepted protocols. PRB IWG accepted protocol is available on the CBM Clearinghouse website (www.cbmclearinghouse.info).

A BLM biologist conducted field visits in the last week of March and the first week of April 2008. During this time, the biologist reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project modification recommendations where wildlife issues arose.

Wildlife species common to the habitat types present are identified in the PRB FEIS (pg. 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 South Prong 1&2 and Laskie Draw project area include (pronghorn antelope, mule deer, and elk). Both pronghorn antelope and mule deer were seen at the onsite. The WGFD has determined that the project area contains spring-summer-fall range for pronghorn antelope, winter and winter-yearlong range for mule deer. The northwest corner of the Laskie POD boundary is in yearlong elk range for the Fortification elk herd. No facilities are proposed within yearlong elk range. The 23-4 and 32-4 well locations are located approximately ¼ mile from the yearlong range boundary and a 1 ½ miles segment of resource (surfaced) road runs between ¼ and ¾ of a mile from yearlong range.

Summer or Spring-Summer-Fall use is when a population or portion of a population of animals uses the documented habitats within this range annually from the end of previous winter to the onset of persistent winter conditions. **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.

Pronghorn antelope within the project area belong to the Gillette herd unit. The 2007 proposed estimate

herd population is 20,000 with a population objective of 11,000. Mule deer within the project area belong to the Powder River herd unit. The 2007 proposed estimate herd population is 16,300 with a population objective of 18,000. Elk within the project area belong to the Fortification herd unit. The 2007 proposed estimate herd population was 261 with a population objective of 150. Big game range maps are available in the PRB FEIS (3-119-143), the project file, and from the WGFD. According to BLM elk collar relocation data, three elk have been located just over one mile north of the POD in the fall and spring of 2005.

3.3.2. Aquatics

The project area is drained by ephemeral tributaries of Barber Creek to the north and Dead Horse Creek to the south. Both of these drainages feed the Powder River. One spring was identified by WLS in the NESE section 12 of T49N. R76W. Fish that have been identified in the Powder River watershed are listed in the PRB FEIS (3-156-159).

Amphibian and reptile species occur throughout the Basin, but there is little recorded baseline information available about them. Confluence Consulting, Inc. identified the following species present within the Clear Creek and Powder River watersheds: Woodhouse's toad, northern leopard frog, gopher snake, and garter snake (2004). Because sampling at the upper two sites on Clear Creek occurred late in the season, seasonality may have influenced the lack of reptiles and amphibians observed at these sites.

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. Many species that are of high management concern use shrub-steppe and shortgrass prairie areas for their primary breeding habitats (Saab and Rich 1997). 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

Raptors species expected to occur in suitable habitats within the Powder River Basin include northern harrier, golden eagle, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, prairie falcon, short-eared owl, great horned owl, bald eagle, rough-legged hawk, merlin, Cooper's hawk, northern goshawk, long-eared owl, and burrowing owl. Most raptor species nest in a variety of habitats including but not limited to; native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, and tree cavities.

Thirty six raptor nest sites were identified by the consultant and BLM within 0.5 mile of the project area, of these, six nests were active in 2008.

Table 4. Documented raptor nests within the project area in 2008.

	BLM ID	SPECIES	UTM E	UTM N	SEC	TWP	RNG	SUBSTRATE
1	648	Golden eagle	424112	4893262	25	49	76	Cottonwood
2	1376	Golden eagle	419564	4895227	21	49	76	Cottonwood
3	1381	Red-tailed hawk	420816	4894841	22	49	76	Cottonwood
4	2676	Golden eagle	419545	4895372	21	49	76	Cottonwood
5	2677	Red-tailed hawk	420881	4894915	22	49	76	Cottonwood
6	2682	Red-tailed hawk	421640	4894520	22	49	76	Cottonwood
7	2683	Unknown	419727	4894308	28	49	76	Cottonwood

	BLM ID	SPECIES	UTM E	UTM N	SEC	TWP	RNG	SUBSTRATE
8	2685	Am Kestrel	419749	4895478	21	49	76	Cliff
9	3546	Red-tailed hawk	427407	4899584	5	49	75	Creek bank
10	3547	Long-eared owl	427702	4898574	8	49	75	Juniper
11	3548	Red-tailed hawk	425908	4897339	18	49	75	Cottonwood
12	3549	Red-tailed hawk	426157	4897658	7	49	75	Cottonwood
13	3639	Unknown	420448	4894114	27	49	76	Cottonwood
14	3812	Unknown	422751	4893918	26	49	76	Cottonwood
15	3813	Red-tailed hawk	422650	4893509	26	49	76	Cottonwood
16	3814	Golden eagle	424204	4893159	25	49	76	Cottonwood
17	3815	Unknown	422677	4894060	26	49	76	Cottonwood
18	3816	Unknown	422943	4893884	26	49	76	Cottonwood
19	3817	Red-tailed hawk	422956	4893937	26	49	76	Cottonwood
20	3818	Unknown	422818	4894173	26	49	76	Cottonwood
21	3820	Red-tailed hawk	420812	4895010	22	49	76	Cottonwood
22	3821	Red-tailed hawk	424469	4892314	36	49	76	Cottonwood
23	4149	Unknown	427398	4898771	8	49	75	Juniper
24	4277	Unknown	426110	4897586	8	49	75	Cottonwood
25	5077	Red-tailed hawk	427468	4895697	20	49	75	Cottonwood
26	5078	Great-horned owl	425890	4895920	19	49	75	Cottonwood
27	5079	Red-tailed hawk	425433	4896191	18	49	75	Cottonwood
28	5080	Red-tailed hawk	423592	4896416	14	49	76	Cottonwood
29	5081	Red-tailed hawk	423400	4896480	14	49	76	Cottonwood
30	5103	Unknown	419127	4895877	21	49	76	Cottonwood
31	5103	Red-tailed hawk	421834	4896925	15	49	76	Cottonwood
32	5429	Golden eagle	420938	4899566	3	49	76	Ponderosa
33	5585	Great-horned owl	420454	4896366	15	49	76	Juniper
34	5590	Unknown	425743	4892909	30	49	75	Cottonwood
35	5586	Red-tailed hawk	419870	4901280	33	50	76	Cottonwood
36	5587	Red-tailed hawk	418853	4898613	9	49	76	Ponderosa

3.3.4.1. Threatened and Endangered Species

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

3.3.4.1.1. 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 2004, the WGFD identified six prairie dog complexes (Arvada, Sheridan, Pleasantdale, Four Corners, Linch, Kaycee, and Thunder Basin National Grasslands) partially or wholly within the BLM Buffalo Field Office administrative area as potential black-footed ferret reintroduction sites (Grenier et al. 2004).

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 1,000 acres of black-tailed prairie dog colonies for survival (USFWS 1989).

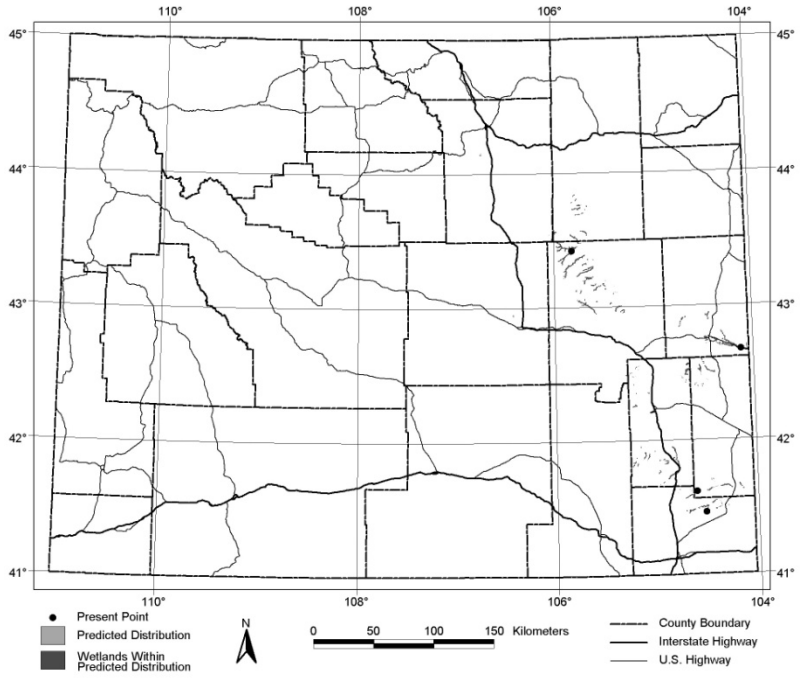
The WGFD believes the combined effects of poisoning and Sylvatic plague on black-tailed prairie dogs have greatly reduced the likelihood of a black-footed ferret population persisting east of the Big Horn Mountains (Grenier 2003). The U.S. Fish and Wildlife Service has also concluded that black-tailed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

Fourteen black-tailed prairie dog colonies were identified during site visits by WLS within the project area and are described in the 2007 wildlife report. The total prairie dog town acreage in the project area in 2007 was 262 acres. Approximately 100 additional acres of prairie dog colonies exist within a mile of the project area. The project area is located within the Pleasantdale complex, a complex identified as a potential reintroduction area. Black-footed ferret habitat is not present within the project area at this time.

3.3.4.1.2. 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. Wyoming Natural Diversity Database model predicts undocumented populations may be present particularly within southern Campbell and northern Converse Counties.

Figure 1. Predicted Distribution of Ute ladies'-tresses in Wyoming



Prior to 2005, only four orchid populations had been documented within Wyoming. Five additional sites were located in 2005 and one in 2006 (Heidel pers. Comm.). The new locations were in the same drainages as the original populations, with two on the same tributary and within a few miles of an original location. Drainages with documented orchid populations include Antelope Creek in northern Converse

County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County. In Wyoming, *Spiranthes diluvialis* blooms from early August to early September, with fruits produced in mid August to September (Fertig 2000).

Barber Creek and Dead Horse Creek and their tributaries are historically ephemeral. One spring in NWSE of section 12 (T49N,R76W) was surveyed for the orchid. All portions of the project area that could support orchid habitat were surveyed for habitat suitability on August 8, 2007. Suitable orchid habitat is present within the project area at the spring listed above.

3.3.4.2. 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. Two habitat types, prairie dog colonies and sagebrush ecosystems, specifically, are the most common among habitat types within the Powder River Basin and contain habitat components required in the life cycle of several sensitive species. These are described below in general terms. Those species within the Powder River Basin that were once listed or candidates for listing under the Endangered Species Act of 1973 and remain BLM Wyoming sensitive species are described in more detail. 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.

3.3.4.2.1. Prairie dog colony obligates

Prairie dog colonies create habitat for many species of wildlife (King 1955, Reading et al. 1989). Agnew (1986) found that bird species diversity and rodent abundance were higher on prairie dog towns than on mixed grass prairie sites. Several studies (Agnew 1986, Clark 1982, Campbell and Clark 1981 and Reading et al. 1989) suggest that species richness increases with colony size and regional colony density. Prairie dog colonies attract many insectivorous and carnivorous birds and mammals because of the concentration of prey species (Clark 1982, Agnew 1986, Agnew 1988).

In South Dakota, forty percent of the wildlife taxa (134 vertebrate species) are associated with prairie dog colonies (Agnew 1983, Apa 1985, McCracken et al. 1985, Agnew 1986, Uresk and Sharps 1986, Deisch et al. 1989). Of those species regularly associated with prairie dog colonies, six are on the Wyoming BLM sensitive species list: swift fox (*Vulpes velox*), mountain plover (*Charadrius montanus*), ferruginous hawk (*Buteo regalis*), burrowing owl (*Athene cunicularia*), loggerhead shrike (*Lanius ludovicianus*), and long-billed curlew (*Numenius americanus*).

3.3.4.2.2. Sagebrush obligates

Sagebrush ecosystems support a variety of species. Sagebrush obligates are animals that cannot survive without sagebrush and its associated perennial grasses and forbs; in other words, species requiring sagebrush for some part of their life cycle. Sagebrush obligates within the Powder River Basin, listed as sensitive species by BLM Wyoming include greater sage-grouse, Brewer's sparrow, sage thrasher, and sage sparrow. Sage sparrows, Brewer's sparrows, sage-grouse, and sage thrashers all require sagebrush for nesting, with nests typically located within or under the sagebrush canopy. Sage thrashers usually nest in tall dense clumps of sagebrush within areas having some bare ground for foraging. Sage sparrows prefer large continuous stands of sagebrush, and Brewer's sparrows are associated closely with sagebrush habitats having abundant scattered shrubs and short grass (Paige and Ritter 1999). Other sagebrush obligate species include sagebrush vole, pronghorn antelope, and sagebrush lizard.

3.3.4.2.3. Bald eagle

On February 14, 1978, the bald eagle was federally listed as Endangered. On August 8, 2007, the bald eagle was removed from the Endangered Species list. The bald eagle remains under the protection of the

Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. In order to avoid violation of these laws and uphold the BLM's commitment to avoid any future listing of this species, all conservation measures and terms and conditions identified in the Powder River Basin Oil and Gas Project Biological Opinion (WY07F0075) (USFWS 2007) shall continue to be complied with.

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 are often more varied. In addition to prairie dogs, ground squirrels, and lagomorphs, carcasses of domestic sheep and big game 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.

Suitable bald eagle winter roost and marginal nesting habitat exists along Dead Horse Creek. Dead Horse Creek is across Interstate 90 from the project area approximately 0.5 mile south. According to the BLM database, no bald eagles have been documented along Dead Horse Creek. The closest documented consistent bald eagle use area is located along the Powder River, eight miles to the west.

3.3.4.2.4. Black-tailed prairie dog

The black-tailed prairie dog was added to the list of Candidate species for federal listing on February 4, 2000 (USFWS 2000). On August 12, 2004, the U.S. Fish and Wildlife Service removed the black-tailed prairie dog's Candidate status. BLM Wyoming considers prairie dogs as a sensitive species and continues to afford this species the protections described in the PRB FEIS. The black-tailed prairie dog is a diurnal rodent inhabiting prairie and desert grasslands of the Great Plains.

Due to human-caused factors, black-tailed prairie dog populations are now highly fragmented, and isolated (Miller 1994). Most colonies are small and subject to potential extirpation due to inbreeding, population fluctuations, and other problems, such as landowner poisoning and disease that affect long term population viability (Primack 1993, Meffe and Carroll 1994, Noss and Cooperrider 1994).

The black-tailed prairie dog is considered common in Wyoming, although its abundance fluctuates with activity levels of Sylvatic plague and the extent of control efforts by landowners. Comparisons with 1994 Digital Ortho Quads indicated that black-tailed prairie dog acreage remained stable from 1994 through 2001. However, aerial surveys conducted in 2003 to determine the status of known colonies indicated that a significant portion (approximately 47%) of the prairie dog acreage was impacted by Sylvatic plague and/or control efforts (Grenier 2004).

Sixteen black-tailed prairie dog colonies were identified during site visits by WLS within the project area and are described in the wildlife report (2007, 2008). The total prairie dog town acreage in the project area in 2007 was approximately 262 acres. Approximately 100 additional acres of prairie dog colonies exist within a mile of the project area.

3.3.4.2.5. Burrowing owl

The burrowing owl is a small, long-legged owl found throughout open landscapes of North and South America. Burrowing owls can be found in grasslands, rangelands, agricultural areas, deserts, or any dry open area with low vegetation where abandoned burrows dug by mammals such as ground squirrels (*Spermophilus spp*.), prairie dogs (*Cynomys spp.),* and badgers (*Taxidea taxus*) are available. Black-tailed

prairie dog colonies provide the primary habitat for burrowing owls (Klute et al. 2003).

The western burrowing owl has declined significantly throughout its North American range. Current population estimates for the United States are not well known but trend data suggest significant declines (McDonald et al. 2004). The last official population estimate placed them at less than 10,000 breeding pairs. The majority of the states within the owl's range have recognized that western burrowing owl populations are declining. It is listed as a sensitive species by the BLM throughout the west and by the USDAFS. Primary threats across the North American range of the burrowing owl are habitat loss and fragmentation primarily due to intensive agricultural and urban development, and habitat degradation due to declines in populations of colonial burrowing mammals (Klute et al. 2003).

Burrowing owl nesting habitat consists of open areas with mammal burrows. Individual burrowing owls have moderate to high site fidelity to breeding areas and even to particular nest burrows (Klute et al. 2003). Burrow and nest sites are reused at a higher rate if the bird has reproduced successfully during the previous year. Favored nest burrows are those in relatively sandy sites (possibly for ease of modification and drainage), areas with low vegetation around the burrows (to facilitate the owl's view and hunting success), holes at the bottom of vertical cuts with a slight downward slope from the entrance, and slightly elevated locations. In Wyoming, egg laying begins in mid-April. Incubation is assumed to begin at the mid-point of the laying period and lasts for 26 days (Olenick 1990). Young permanently leave the primary nest burrow around 44 days from hatch (Landry 1979). Juveniles will continue to hunt with and associate with parents until migration (early September through early November) (Haug 1985).

Though the BLM BFO databases and the survey information provided by WLS identified no burrowing owl nests, suitable habitat does exist on the black-tailed prairie dog towns in the project area.

3.3.4.2.6. Grouse

3.3.4.2.6.1. Greater sage-grouse

The greater sage-grouse is listed as a sensitive species by BLM (Wyoming). In recent years, several petitions have been submitted to the USFWS to list greater sage-grouse as Threatened or Endangered. On January 12th, 2005, the USFWS issued a decision that the listing of the greater sage-grouse was "not warranted" following a Status Review. The decision document supporting this outcome noted the need to continue or expand all conservation efforts to conserve sage-grouse. A judge in Idaho ordered the USFWS to conduct a new Status Review as a result of a lawsuit and questions surrounding the 2005 review (Winmill Decision Case No. CV-06-277-E-BLW, December 2007).

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. Moderately dense to dense sagebrush is present in patches throughout the project area. Sections 1, 2, 3, 4, 9, 11, 12 of T49N,R76W and 7, 18, 19, 20 of T49N,R75W contained large stands of sage and moderate topography. Approximately 70 percent of the project area meets seasonal habitat requirements and are large enough to meet the landscape scale requirements of the bird (BLM 2008). Sage-grouse habitat models indicate that the majority of the project area contains high quality sage-grouse nesting habitat and high quality sage-grouse wintering habitat (Walker et al. 2007). At the onsite, BLM biologists found sage-grouse sign in most of the project area. Individual birds were seen in SWSW Section 2 and NENE Section 19. BLM records identified six sage-grouse leks within 4 miles of the POD. The 4-mile distance was recommended by the State wildlife agencies' ad hoc committee for consideration of oil and gas development effects to nesting habitat (WGFD 2008). Although within four miles of the project, the Morgan Draw and Barlow leks are south of the Interstate and birds bred there may not cross the Interstate into the project area to nest, raise young or winter. Radio-marked Sage-grouse in the Powder River basin were documented traveling across the freeway to reach wintering habitat in the Bear Draw/Indian Creek area west of the

Powder River. The highest quality winter habitat around the project area is south of Interstate 90 so the birds breeding south of the freeway would most likely stay on the south side. These six lek sites are identified below (Table 6).

Table 6. Sage-grouse leks surrounding the project area.

LEK NAME	LEGAL LOCATION	OCCUPANCY AND ACTIVITY STATUS IN 2008 (PEAK MALES)	DISTANCE FROM PROJECT AREA
Laskie Draw East	NENW section 3 4976	Occupied. (11)	0.25 mile to discharge point. 0.5 mile to well. Road through lek.
Laskie Draw	SESW Section4 4976	Occupied (0)	0.25 mile to well. Road adjacent to lek.
Watsabaugh IV	SENE Section17 4975	Occupied (42)	0.8 mile to well.
Barber Creek/South Prong	SESE Section1 4976	Occupied (0)	0.32 mile to well. Road through lek.
Morgan Draw	NWNW Section 11 4876	Occupied (5)	2.75 miles to well.
Barlow	NESW Section 35 4975	Occupied (0)	2.5 miles to water discharge point. 4.0 mile to well.

*Occupied. A lek that has been active during at least one strutting season within the prior ten years.

3.3.4.2.6.2. Sharp-tailed grouse

Sharp-tailed grouse inhabit short and mixed-grass prairie, sagebrush shrublands, woodland edges, and river canyons. In Wyoming, this species is found where grasslands are intermixed with shrublands, especially wooded draws, shrubby riparian area, and wet meadows.

The project area has the potential to support sharp-tailed grouse during most of the year. The mosaic of grasslands and sagebrush-grasslands could provide habitat from April through October. Cottonwoods and junipers could provide buds and berries, respectively, to sustain grouse through the winter. No sharp-tailed grouse were documented in the project area.

3.3.4.2.7. Mountain plover

The mountain plover was proposed for listing in 1999 (USFWS). In 2003, the USFWS withdrew a proposal to list the Mountain Plover as a Threatened species, stating that the population was larger than had been thought and was no longer declining. Mountain plovers, which are a BLM sensitive species, are typically associated with high, dry, short grass prairies (BLM 2003). Mountain plover nesting habitat is often associated with heavily grazed areas such as prairie dog colonies and livestock pastures.

Suitable mountain plover habitat is limited to the prairie dog towns within the project area. Suitable habitat was searched May 5, 25, and June 8, 2007 and May 14 and 29, 2008 with negative results (WLS 2007, 2008).

3.4. West Nile Virus

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

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

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

Table 3.4 Historical West Nile Virus Information

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

*Wyoming Department of Health Records September 12, 2007.

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

Although most of the attention has been focused on human health issues, WNv has had an impact on vertebrate wildlife populations. At a recent conference at the Smithsonian Environmental Research Center, scientists disclosed WNv had been detected in 157 bird species, horses, 16 other mammals, and alligators (Marra et al 2003). In the eastern US, avian populations have incurred very high mortality, particularly crows, jays and related species. Raptor species also appear to be highly susceptible to WNv. During 2003, 36 raptors were documented to have died from WNv in Wyoming including golden eagle, red-tailed hawk, ferruginous hawk, American kestrel, Cooper's hawk, northern goshawk, great-horned owl, prairie falcon, and Swainson's hawk (Cornish et al. 2003). Actual mortality is likely to be greater. Population impacts of WNv on raptors are unknown at present. The Wyoming State Vet Lab determined 22 sage-grouse in one study project (90% of the study birds), succumbed to WNv in the PRB in 2003. While birds infected with WNv have many of the same symptoms as infected humans, they appear to be more sensitive to the virus (Rinkes 2003).

Mosquitoes can potentially breed in any standing water that lasts more than four days. In the Powder River Basin, there is generally increased surface water availability associated with CBNG development. This increase in potential mosquito breeding habitat provides opportunities for mosquito populations to increase. Preliminary research conducted in the Powder River Basin indicates WNv mosquito vectors

were notably more abundant on a developed CBNG site than two similar undeveloped sites (Walker et al. 2003). Reducing the population of mosquitoes, especially species that are apparently involved with bird-to-bird transmission of WNv, such as *Culex tarsalis*, can help to reduce or eliminate the presence of virus in a given geographical area (APHIS 2002). The most important step any property owner can take to control such mosquito populations is to remove all potential man-made sources of standing water in which mosquitoes might breed (APHIS 2002).

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

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

3.5. Water Resources

The project area is within the Upper Powder River drainage system. It lies in the headwater tributaries of the South Prong of Barber Creek and the North Prong and mainstem of Dead Horse Creek. All of the drainages in the project area, with the possible exception of Dead Horse Creek, are characteristic of ephemeral systems. 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 of 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 significant.

Dead Horse Creek itself could be characterized as ephemeral to intermittent, with water flowing mostly in response to precipitation and snowmelt events (ephemeral). However, some reaches have a limited flow associated with shallow groundwater contributions. Near its mouth Dead Horse Creek is ephemeral.

3.5.1. Groundwater

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

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

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

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

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

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

The WDEQ implemented requirements for monitoring shallow groundwater of Class III or better quality under unlined CBNG water impoundments in August of 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 21 registered stock, miscellaneous and domestic water wells within ½ mile of the POD boundary. 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 Barber Creek and Dead Horse Creek drainages which are part of the Upper Powder River watershed. All of the drainages within the project area are ephemeral (flowing only in response to a precipitation event or snow melt – PRB FEIS Chapter 9 Glossary). The channels are primarily well vegetated grassy swales, without defined bed and bank.

The PRB FEIS presents the historic mean Electrical Conductivity (EC, in µmhos/cm) and Sodium Adsorption Ratio (SAR) by watershed at selected 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 µmhos/cm at Maximum monthly flow to 3400 µmhos/cm at Low monthly flow and the SAR ranges from 4.76 at Maximum monthly flow to 7.83 at Low monthly flow. These values were determined at the USGS station located on the Powder River at Arvada, Wyoming (PRB FEIS page 3-49).

The operator has identified a natural spring within this POD boundary at T49N, R75W, Sec 20. During the field investigation, there was insufficient flow for sample collection and analysis. The operator has committed in their water management plan, page 13, to collect this data prior to beginning the discharge of water produced as a result of this federal action.

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

3.6. Cultural Resources

Class III inventories were conducted for the SPU 1 &2; and Laskie Draw projects prior to on-the-ground project work (BFO project #'s 7008007-Garber 2007, 7008007a-Fewings 2008a, 70080080-Fewings 2008b). Western Land Services conducted the Class III inventory following the Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines (48FR190) for the proposed project. Clint Crago, BFO archaeologist, reviewed the reports for technical adequacy and for compliance with BLM and Wyoming State Historic Preservation Office standards, and determined them to be adequate. The following resources are located within the Area of Potential Effect (APE).

Table 3.5 Cultural Resource Sites Identified within the SPU Units 1&2 project area

Site Number	Site Type	Eligibility
48CA5034	Prehistoric Lithic Scatter	Not Eligible
48CA5035	Historic Artifact Scatter and Prehistoric Debitage	Not Eligible
48CA5036	Historic Can Scatter and Prehistoric Debitage	Not Eligible
48CA5037	Prehistoric Lithic Scatter	Not Eligible
48CA5038	Prehistoric Debitage and Historic Steel Trap	Not Eligible
48CA5039	Prehistoric Lithic Scatter	Not Eligible
48CA5040	Historic Homestead	Not Eligible
48CA5041	Prehistoric Lithic Scatter	Not Eligible
48CA5042	Prehistoric Lithic Scatter	Not Eligible
48CA5043	Prehistoric Lithic Scatter and Historic Can Scatter	Not Eligible

Site Number	Site Type	Eligibility
48CA5084	Prehistoric Lithic Scatter	Not Eligible
48CA5133	Prehistoric Lithic Scatter	Not Eligible
48CA5197	Historic Herder Camp	Not Eligible
48CA6507	Prehistoric Lithic Scatter	Not Eligible
48CA6508	Historic Homestead	Not Eligible
48CA6509	Prehistoric Lithic Scatter	Not Eligible
48CA6510	Historic Trash Scatter with Depressions	Not Eligible
48CA6511	Prehistoric Lithic Scatter with possible Stone Circle	Not Eligible
48CA6706	Historic Structure	Not Eligible

Table 3.6 Cultural Resource Sites Identified within the Laskie Draw project area

Site Number	Site Type	Eligibility
48CA6813	Historic Cistern and Artifact Scatter	Not Eligible

According to the cultural resource addendum report (Fewings – WLS, 2008a), several areas were identified to have less than adequate surface visibility for locating cultural resources due to dense grass cover. Therefore, the following areas will not be approved until they receive an adequate class III cultural resource inventory:

12-10-4976 well: center of survey block, as well as road and pipeline corridor
13-14-4976 well: center of survey block
12-15-4976 well: drainage bottoms in survey block
41-15-4976 well: southeast corner of survey block
43-23-4976 well: north and west sides of survey block
21-23-4976 well: east end of linear survey
Proposed pipeline in T49N T76W Section 23 SW SE: entire linear corridor

Visual Resources

Visually, the project area is comprised of moderate to rolling river breaks east of the Powder River. In general, the terrain is more rugged and eroded in the northern and western portion of the project area. The vegetation in the more eroded areas is dominated by sagebrush. The eastern part of the project area is primarily grassland, with spotty sagebrush. Several barren spots of highly erosive soils on slopes are visible above the highway. Some ranching facilities are evident along the Interstate, as well as CBNG development south and north of both PODs.

Approximately 552 acres of the Laskie Draw POD and 1025 acres of the South Prong 1 and 2 POD are included in the Class II Visual Resource Management corridor along Interstate 90 (comprising about thirteen percent of the total project area of 11,680 acres). Class II objectives are to retain the existing character of the landscape. The level of change to the characteristic landscape should be low and not attract the attention of the casual observer. Current visual resource management directed in the EIS

Record of Decision states, "Within the designated VRM Class II corridors along Interstate 90 and State Highway 14, all project facilities on BLM surface will be screened completely from these highways or camouflaged to retain basic elements of form, line, color and texture of the landscape".

Approximately 2,515 acres (21 %) of South Prong 1 and 2 POD are designated as Class III for visual resource management. This area is along Interstate 90, east of the Powder River corridor. Class III objectives are to partially retain the existing character of the landscape. The level of change should be moderate; activities could attract attention but should not dominate the view.

The remainder of the project area is Visual Resource Management Class IV, which allows major modification of the existing landscape character. This part of the POD area is at least 0.75 mile north of the Interstate. Only about 967 acres of the total project area is BLM surface; the remainder is either state or private surface.

Three key observation points along Interstate 90 were identified for this project. The first is approximately 4.2 miles east of the Dead Horse Creek exit. The second and third are 4.2 miles west of the Badger Creek exit and 2 miles west of the Badger Creek exit, respectively. Four proposed well sites and three access road/utility corridors within the Class II area are visible from the first observation point. A proposed access road/utility corridor on BLM surface in the Class IV area is also visible. Two proposed well sites, two access/utility corridors, and a power line within the Class II area are visible from the second observation point. One well site will be visible in the background from this observation point; it is in the Class III area, at the head of a drainage. Two proposed well sites and two access/utility corridors are visible in the foreground from the third observation point. These facilities are within the Class III area although on private surface.

4. ENVIRONMENTAL CONSEQUENCES

The changes to the proposed action (Alternative B) resulted in development of Alternative C as the preferred alternative. The changes have reduced impacts 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

Impacts to vegetation and soils from surface disturbance will be reduced, by following the operator's plans and BLM applied mitigation. Most of the 183 wells are located with two wells per location. There are 100 well site locations. Of the 100 proposed locations 68 locations can be drilled without a well pad being constructed (1 location will need a slot cut to level for the wheels of the drilling rig) and 32 locations will require a constructed (cut & fill) well pad. Locations without constructed pads would involve digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction (estimated approximate size of 25 x 40 feet), and 120 x180 feet of compaction from construction vehicles driving, parking and laying pipe at the drill site. Estimated short term disturbance associated with these 68 wells would involve approximately 0.5 acre/location for 34 total acres. The other 32 wells requiring cut & fill pad construction would disturb approximately 1.0 acre/location pad for a total of 32 acres. The total estimated short disturbance for the183 wells would be 66 acres, during construction. After drilling the wells, locations are to be reclaimed to an average 0.1 acre/location. Long term disturbance of well locations will be 10.0 acres.

Approximately 11.28 miles of improved roads would be constructed to provide access to various well locations. Approximately 7.0 miles of new and existing two-track trails would be utilized to access well sites. The majority of proposed pipelines (gas and water) have been located in "disturbance corridors." Disturbance corridors involve the combining of 2 or more utility lines (water, gas, power) in a common trench, usually along access routes. This practice results in less surface disturbance and overall

environmental impacts. Approximately 1.36 miles of pipeline would be constructed outside of corridors.

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

- Modification of hill slope hydrology.
- Mixing of horizons which occur where construction on roads, pipelines or other activities take place. Mixing may result in removal or relocation of organic matter and nutrients to depths where it would be unavailable for vegetative use. Soils which are more susceptible to wind and water erosion may be moved to the surface. Soil structure may be destroyed, which may impact infiltration rates. Less desirable inorganic compounds such as carbonates, salts or weathered materials may be relocated and have a negative impact on re-vegetated areas. This drastically disturbed site may change the ecological integrity of the site and the recommended seed mix.
- Loss of soil vegetation cover, biologic crusts, organic matter and productivity. With expedient reclamation, productivity and stability should be regained in the shortest time frame.
- Soil erosion would also affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography and cover.
- Soil Compaction is the collapse of soil pores resulting in decreased infiltration and increased erosion potential. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction may be remediated by plowing or ripping.
- An important component of soils in Wyoming's semiarid rangelands, especially in the Wyoming big sagebrush cover type, are biological soil crusts, or cryptogamic soils that occupy ground area not covered with vascular plants. Biological soil crusts are predominantly composed of cyanobacteria, green and brown algae, mosses and lichens. They are important in maintaining soil stability, controlling erosion, fixing nitrogen, providing nutrients to vascular plants, increasing precipitation infiltration rates, and providing suitable seed beds (BLM 2003). They are adapted to growing in severe climates; however, they take many years to develop (20 to 100) and can be easily disturbed or destroyed by surface disturbances associated with construction activities.

These impacts, singly or in combination, would increase the potential for valuable soil loss due to increased water and wind erosion, invasive/noxious/poisonous plant spread, invasion and establishment, and increased sedimentation and salt loads to the watershed system. Soil disturbances other than permanent facilities could be short term, and may have minor impacts with expedient, successful interim reclamation and site stabilization. Construction activities will follow Best Management Practices (BMPs), seed mixes were determined based on soil map unit types, dominant ecological sites found within the project area.

The proposed action was designed to avoid highly erosive areas which have a low potential for successful reclamation wherever possible. However, some areas will be challenging for reclamation due to soil properties and other site characteristics. Disturbance within these areas will require extraordinary measures to insure that reclamation success is attained. Wells 13-15-4979, 41-22-4976, and 12-23-4976 and roads and pipelines with low reclamation potential are identified as areas requiring additional reclamation efforts beyond traditional methods.

Due to topography and soils at the 13-15-4979, 41-22-4976, and 12-23-4976 the proponent proposed and will implement additional stabilization and reclamation efforts. Stabilization techniques proposed include spreading of straw mulch and crimping it into the soil, and drill seeding and fertilizing. In areas of steep slopes hydro-seeding and matting will be used to stabilize soils. A cover crop of oats was proposed to reduce erosion during germination of desirable species. In addition to the efforts listed in the proposed action, BLM is requiring stabilization effort to occur within 30 days of the start of the construction.

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. 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, waddles etc.) would ensure land productivity/stability is regained and maximized.

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

Table 4.1 summarizes the proposed surface disturbance.

Table 4.1 - SUMMARY OF DISTURBANCE

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Wells Nonconstructed Pad Constructed Pads	183 68 32	Many locations have 2 wells per location. There are 100 locations. Pads are reclaimed to average of 0.1acres/location.	10 acres	Long Term
Gather/Metering Facilities	0	Site Specific	0.0	Long Term
Screw Compressors	0	Site Specific	0.0	Long Term
Monitor Wells	0	0.1/acre	0	Long Term
Impoundments On-channel-primary On-channel-secondary Off-channel Water Discharge Points	 8 2 10	 Site Specific Site Specific Site Specific or 0.01 ac/WDP	 25 12 0.5	Long Term
Channel Disturbance Headcut Mitigation* Channel Modification	 0 0	 Site Specific Site Specific	 0.0 0.0	
Improved Roads No Corridor With Corridor	11.28 1.05 10.23	 28' Width 40' Width	 3.56 49.64	Long Term
2-Track Roads No Corridor With Corridor	5.78 0 5.78	 40' Width	 28.06	Long Term
Pipelines No Corridor	5.91 1.36	 40' Width	 6.62	Short Term

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
With Corridor	4.55	40' Width	23.65	
Overhead Powerlines	3.69	15' Width	0.56	Long Term

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

4.1.1. Wetland/Riparian

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow (PRB FEIS pg 4-74). Re-surfacing water from the impoundments will potentially allow for wetland-riparian species establishment. Continuous high stream flows into wetlands and riparian areas would change the composition of species and dynamics of the food web. The shallow groundwater table would rise closer to the surface with increased and continuous stream flows augmented by produced water discharges. Vegetation in riparian areas, such as cottonwood trees, that cannot tolerate year-round inundated root zones would die and would not be replaced. Other plant species in riparian areas and wetland edges that favor inundated root zones would flourish, thus changing the plant community composition and the associated animal species. A rise in the shallow ground groundwater table would also influence the hydrology of wetlands by reducing or eliminating the seasonal drying periods that affect recruitment of plant species and species composition of benthic and water column invertebrates. These changes to the aquatic food web base would affect the higher trophic levels of fish and waterfowl abundance and species richness for wetlands and riparian areas." (PRB FEIS Page 4-175).

The operator has committed to containing all water within the impoundments associated with this federal action. They have committed to deal promptly with seepage problems by applying best management practices to reduce adverse effects to downstream vegetation caused by such seepage. Such BMPs include, but are not limited to, lining impoundments with impervious substances, installation of toe drains and pump-back systems, construction of additional storage, and more.

The operator has committed to monitor the spring in the NENW of Section 29, T49N, R75W, for flow rate and water quality at least twice yearly during the production phase of this POD.

4.1.2. Invasive Species

Based on the investigations performed during the POD planning process, the operator has committed to the control of noxious weeds and species of concern using the following measures in an Integrated Pest Management Plan (IPMP) included in the proposal. The IPMP for the SPU 1&2 and Laskie 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.

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

Construction of proposed pipelines, water management infrastructure, produced water discharge points and related facilities would present opportunities for weed invasion and spread. Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry regimes in the areas of water

release and storage. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, spotted knapweed, diffuse knapweed, Scotch thistle, Canada thistle and perennial pepperweed. However, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

4.1.3. Cumulative Effects

The PRB FEIS stated that cumulative impacts to soils could occur due to sedimentation from water erosion that could change water quality and fluvial characteristics of streams and rivers in the sub-watersheds of the Project Area. SAR in water in the sub-watersheds could be altered by saline soils because disturbed soils with a conductivity of 16 mmhos/cm could release as much as 0.8 tons/acre/year of sodium (BLM 1999c). Soils in floodplains and streambeds may also be affected by produced water high in SAR and TDS. (PRB FEIS page 4-151).

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

- They are proportional to the actual amount of cumulatively produced water in the Upper Powder River drainage and the total amount that was predicted in the PRB FEIS, which is only approximately 19% 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 South Prong Barber Creek and Dead Horse Creek and to divert water to other strategies (treatment and discharge to the Powder River, deep injection in Midwest, etc), if necessary, to prevent significant volumes of water from flowing into the Upper Powder River tributaries.

Additional mitigation measures may be required as this POD is developed.

4.2. Wildlife

4.2.1. Big Game Direct and Indirect Effects

Under the environmentally preferred alternative, spring-summer-fall range for pronghorn antelope, winter and winter-yearlong range for mule deer would be directly disturbed with the construction of wells, reservoirs, pipelines and roads.

Two radio collared elk were relocated approximately 1.5 mile from the 32-4 well in the May of 2005 and one other elk 2.5 miles from the 32-4 well was relocated in October of 2005. The closest crucial range for elk is parturition range, just over 3 miles north of the POD, with crucial winter range approximately 5.5 miles north. The 23-4 and 32-4 well locations are located approximately ¼ mile from the yearlong range boundary and a 1 ½ miles segment of resource (surfaced) road runs between ¼ and ¾ of a mile from yearlong range. The yearlong range affected by the proposed action is the NW ¼ of section 4, the east ½ of section 5 T49N,R76W) and the southern ½ of 33 and 34 (T50N,R76W). The effects from the proposed action on elk will not impact the population; however the cumulative effects will and are discussed in the next section. If the 23-4 well were not approved, the impact to elk yearlong range would be reduced by approximately a 1/2 section.

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 indicates 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 become accustomed to the disturbance (Madson 2005).

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

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

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

4.2.1.1. Big Game Cumulative effects

A small portion of the Laskie Draw POD boundary (NW1/4 of Section 4 T49N, R76W) is in yearlong elk range. No project facilities or activities are proposed within the yearlong range. Coal bed natural gas development impacts to the Fortification Creek elk herd are currently being addressed in a RMP amendment. Preliminary analysis from this amendment is summarized below. The Final RMP Amendment and decision record are scheduled for completion in January 2009.

The elk herd originally used the entire 123,000-acre yearlong elk range designated by the WGFD; the current herd largely restricts their activity to the Wilderness Study Area (WSA) and adjacent areas of the FCPA. Approximately 90 percent of the 2005 radio-collared animal locations were north of Fortification Creek (BLM 2007a), which generally bisects the yearlong elk range. The project area is on the southern edge of the elk yearlong range. However, it should be noted that all the 2005 elk were captured north of Fortification Creek despite an effort to distribute captures throughout the elk range. Preliminary data from elk collared in March 2008, where seven elk were collared south of Fortification Creek and 31 north of the creek, indicate more use south of Fortification Creek during May and June than in the 2005 study.

BLM has indicated that loss of habitat (effective habitat and security habitat) would serve to evaluate management actions, and these are the metrics used in the present analysis. The discussion below describes the factors that define habitat loss for wildlife, with specific references to elk, and to the Fortification Creek elk herd where data were available.

Direct Habitat Loss

Direct habitat loss occurs when required life-sustaining conditions are lost (i.e., through removal of vegetation or draining a pond). Removal of vegetation affects wildlife by reducing the extent or quality

of habitat in terms of food, cover, and structure for nesting and other uses. These impacts are relatively simple to quantify by comparing the amount of habitat lost to the amount preserved. For example, removal of vegetation during construction of a road or well pad essentially strips the affected area of any wildlife value. While closure and reclamation of temporarily disturbed areas can eventually restore lost habitat values, the disturbance may have a long duration (10 or more years for wells) and require decades for recovery of pre-disturbance structure and function. For the purposes of this analysis the impact of direct habitat loss is dwarfed by effective habitat loss (see below). As a consequence, many of the impacts will be evaluated in terms of effective habitat loss.

Effective Habitat Loss

While some species are more tolerant of human activity than others, virtually all species have some threshold of disturbance above which they will abandon or avoid an area. The result is a de facto loss of habitat, because avoided areas meet no survival needs. The amount of habitat actually available to wildlife is called effective habitat, and reductions in the amount of effective habitat can greatly exceed any direct habitat loss. Also important is security habitat, defined as a place to escape from disturbance. Security habitat is typically defined in patches of a minimum size, generally 250 acres for elk. Effective loss of habitat can occur as a result of habitat fragmentation, disturbance, and interference with movement. These impacts to habitat reduce the ability of the habitat to provide the basic needs of wildlife.

Habitat fragmentation is increasingly recognized as an important impact on wildlife. Impacts of habitat fragmentation relate to the loss of large habitat blocks and the increased percentage of "edge" on smaller blocks as compared to larger blocks. Roads can cause habitat fragmentation, and hence loss of effective habitat, because many species exhibit a decline in use of areas adjacent to roads. A study in central Wyoming reported that mineral drilling activities displaced mule deer by more than 0.5 miles (Hiatt and Baker 1981). Another cause of habitat fragmentation is the replacement of native vegetation by weeds. The presence of cheatgrass and other invasive non-native weeds decreases species richness.

Disturbance impacts occur when some type of activity, typically of human origin, causes animals to shift their activity or alter their behavior. Disturbance impacts generally overlap with habitat fragmentation, because many of the more common and important types of fragmentation (i.e., roads) also include increased levels of human activity.

Habitat loss, habitat fragmentation, and disturbance impacts can also affect wildlife by altering important daily or seasonal movement patterns. These patterns may be altered through shifts to avoid human activity or to avoid crossing open areas that provide inadequate cover. Conversely, some species and populations adapt to disturbance. This effect, called habituation, is very difficult to predict with a species such as elk. Some populations appear to habituate, such as in Yellowstone National Park, and yet others do not, and continue to be stressed and move away from human disturbance, as appears to be the case for the Fortification Creek herd. Elk habituate in areas where activity is predictable and non-lethal. Hunted populations show fewer tendencies to habituate, which appears to be the case in Fortification Creek.

Disturbance is a key factor in effective habitat loss. For example, Reed et al. (1996) estimated that the effective habitat loss because of roads was 2.5 to 3.5 times as great as actual habitat loss. In the Fortification Creek Area, 26 elk collared in 2005 by BLM and WGFD avoided areas within 1.7 miles of oil, natural gas, and CBNG wells and 0.5 miles of roads. A study in the Jack Morrow Hills reported elk avoidance distances of 1.73 miles from roads and 1.24 miles from oil and gas activity (Powell 2003, Sawyer et al. 2007). The assumption can be made that elk will avoid areas within 1.7 miles of the proposed development.

Deer and Antelope

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

4.2.2. Aquatics Direct and Indirect Effects

Produced water is to be fully contained in reservoirs or piped to the Powder River for treatment and discharge or piped to Midwest for injection into Madison Formation wells. If reservoirs within this project were to discharge, except in cases of flood events, it is unlikely that the produced water would reach a fish-bearing stream, and that downstream species would be affected.

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

Altering water temperatures, flow timing and magnitude, turbidity and chemical composition of the Powder River could harm native fish species that inhabit the Powder River. Alterations could also allow for non native species to become established. Any water development that alters discharge patterns, reduces turbidity, changes water quality, modifies sediment transport, or blocks migratory routes for fish is likely to result in changes in the fish community. Additionally, altering of tributaries may have adverse effects to aquatic species. Tributaries provide spawning and nursery habitat for riverine fishes and support unique fish assemblages. Seasonal movements of riverine fishes into tributaries may be essential to the continued maintenance of several species found in the Powder River (Hubert 1993).

Change in Water Quality

Fish and amphibian species have evolved and adapted to existing conditions. Changes in water quality may have detrimental impacts on the native aquatic fauna. Major information gaps for these species include feeding habits, reproduction, specific habitat preference (pools, riffles, runs, backwaters, side channels, or a combination), and seasonal habitat use, therefore, it is difficult to fully understand how changes in water quality may affect native aquatic fauna.

The WGFD initiated a detailed fish and amphibian survey of the main-stem Powder River in 2004 to determine baseline species composition and distribution in the Basin. In accordance with the PRB FEIS, a monitoring plan was establish by the PRB Interagency Working Group. The plan calls for baseline data collection over a three year period which is intended to provide information relative to the effects upon the aquatic biota of CBNG water.

Changes in the conductivity and sodium absorption ratio may occur as increased flows move sediment from channel bottoms and potentially increase erosion of floodplains. Confluence Consulting, Inc. reported high salinities and electrical conductivities, possibly due to CBNG water, for the Spotted Horse drainage in their report on the Powder River (2004). This report indicated that CBNG discharges could affect native species in the drainage. See Section 3.5.2 of this EA for water quality information associated with this project.

Change in Water Quantity

Native fauna in the Powder River drainage have evolved and adapted to a dynamic hydrography with high sediment loads. Changes in this flow regime (i.e., perennial flows) may seriously impact native fauna by altering their use of historical habitats for spawning, rearing, and reproduction. Alterations that impact channel morphology is an issue, and may have impacts to the aquatic biota due to changes in sediment loads, loss of habitat, and possible disruption of migration movements due to barriers created by culverts and/or head cuts.

It is difficult to assess, due to limited information, what effects this discharge may have upon the aquatic

biota in the Powder River system. The increase in flow resulting from the discharge of project CBNG water would be more noticeable during the late summer months or winter months when the mean monthly flow is smaller than during the remainder of the year. The flow attributable to project produced water is very small relative to storm flows. Peak flow estimates for the river range from 3,560 cfs for a two year storm event to 18,065 cfs for a 100-year storm event. Addition of the produced water would facilitate beneficial uses such as livestock supply and irrigation supply during the late summer and winter months when the naturally occurring flow is diminished.

The volume of water permitted for direct discharge is based upon the water quality effects related to irrigation downstream in Montana. The flow rate is permitted to mimic seasonal highs and lows and adjusted accordingly.

4.2.2.1. Aquatics Cumulative effects

WDEQ is aware of the concerns about the effects of water quality and flows relative to discharge of water directly into the Powder River. They are taking a conservative approach to permitting until more information can be obtained. Long term water quality and flow monitoring, that would be required in the WYPDES permit, would ensure that effluent limitations are met. Under permitted conditions, it is not anticipated that existing downstream water uses would be affected.

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-247.

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).

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

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

The use of the proposed water treatment facilities can increase the potential for migratory bird mortality in the evaporation ponds that receive a backwash stream from the conditioning ponds. This evaporation

pond will contain a concentrated brine solution. Birds entering this pond can ingest the brine and die from sodium toxicity. Salt toxicosis has been reported in ponds with sodium concentrations over 17,000 mg/L. Ingestion of water containing high sodium levels can chronically affect aquatic birds, especially if a source of fresh water is not available nearby. Aquatic birds ingesting hypersaline water can be more susceptible to avian botulism. During cooler temperatures, sodium in the hypersaline water can crystallize on the feathers', affecting thermoregulatory and buoyancy functions, and causing the bird to die of hypothermia or drowning (Windingstad et al.2004). Effective wildlife exclusionary devices, such as netting, will be required to prevent access by migratory birds, or other options should be utilized to contain and dispose of the brine solution should sodium concentrations rise over 17,000 mg/L.

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.

Migratory bird species within the Powder River Basin nest in the spring and early summer and are vulnerable to the same affects as sage-grouse and raptor species. Though no timing restrictions are typically applied specifically to protect migratory bird breeding or nesting, where sage-grouse or raptor nesting timing limitations are applied, nesting migratory birds are also protected. Where these timing limitations are not applied and migratory bird species are nesting, migratory birds remain vulnerable. Additional direct and indirect effects to migratory birds are discussed in the PRB FEIS (4-231-235).

4.2.3.1. Migratory Birds 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 overheating or chilling of eggs or chicks. 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.

The presence of overhead power lines may impact foraging raptors. Raptors forage opportunistically throughout the Powder River Basin. Power poles provide attractive perch sites in areas where mature trees and other natural perches are lacking. 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.

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. Nests within 0.5 mile of wells are listed in the following table:

BLM ID	SPECIES	UTM E	UTM N	SCTN	TWP	RNG	SUBSTRATE	Wells and associated infrastructure:
3548	Red-tailed hawk	425908	4897339	18	49	75	Cottonwood	41-13, 14-7, 23-7, 12-18
3549	Red-tailed hawk	426157	4897658	7	49	75	Cottonwood	41-13, 14-7, 23-7, 12-18
3812	Unknown	422751	4893918	26	49	76	Cottonwood	34-23
3815	Unknown	422677	4894060	26	49	76	Cottonwood	34-23
3816	Unknown	422943	4893884	26	49	76	Cottonwood	34-23
3817	Red-tailed hawk	422956	4893937	26	49	76	Cottonwood	34-23
3818	Unknown	422818	4894173	26	49	76	Cottonwood	34-23
3820	Red-tailed hawk	420812	4895010	22	49	76	Cottonwood	34-23
4277	Unknown	426110	4897586	8	49	75	Cottonwood	new 31-18, 41-18
5077	Red-tailed hawk	427468	4895697	20	49	75	Cottonwood	14-17, 22-20, 12-20
5078	Great-horned owl	425890	4895920	19	49	75	Cottonwood	21-19, 32-19, 41-19, 12-19,
5079	Red-tailed hawk	425433	4896191	18	49	75	Cottonwood	41-24, 21-19
5080	Red-tailed hawk	423592	4896416	14	49	76	Cottonwood	23-13, 14-13, 34-14, 41-23, 42-14
5081	Red-tailed hawk	423400	4896480	14	49	76	Cottonwood	32-14, 14-13, 41-23, 34-14, 42-14, 34-14
5429	Red-tailed hawk	421834	4896925	15	49	76	Cottonwood	12-14, 43-15, 32-15,
5585	Golden eagle	420938	4899566	3	49	76	Ponderosa	21-10, 43-4, 41-9,
5590	Great-horned owl	420454	4896366	15	49	76	Juniper	13-15
5591	Red-tailed hawk	418853	4898613	9	49	76	Ponderosa	012-9

Changes that were made as a result of the onsite that will minimize impacts to raptors include the following: 12-9 well - Moved out of view of new red-tailed hawk nest. 43-14 well - Dropped location due to two raptor nests. 43-15 well - restricted visitation and maintenance (Nowhere to move the well). 22-20 well - Moved approx 200' north due to raptor nest and grouse habitat. 14-13GW - Moved out of

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

4.2.4.1. Raptors 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.

4.2.5. Threatened and Endangered and Sensitive Species

Potential project effects on Threatened and Endangered Species were analyzed and a summary is provided in Table 4.2.5.1. Threatened and Endangered Species potentially affected by the proposed project area are further discussed following the table.

4.2.5.1. Threatened and Endangered Species

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

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Endangered				
Black-footed ferret (*Mustela nigripes*)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NLAA	Suitable habitat of insufficient size.
Threatened				
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Riparian areas with permanent water	NS	NE	Only suitable habitat (spring) will not be impacted.

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

4.2.5.1.1. Black-Footed Ferret Direct and Indirect Effects

The black-tailed prairie dog colonies within and adjacent to the project area are currently of insufficient size for supporting ferrets. The project area has been identified as a potential reintroduction area. The proposed action will place one well, and increase traffic on established roads, in prairie dog towns. No impoundments are planned on prairie dog towns. Individual prairie dogs will be killed by the proposed action through vehicle strikes, trenching and digging reserve pits. Population level prairie dog impacts are not anticipated.

No surveys for ferrets were required or conducted. It is extremely unlikely that any black-footed ferret is present in the project area. The proposed action will most likely make portions of the project area unsuitable for ferrets. The proposed action will impair the area for any potential black-footed ferret reintroduction for the life of the project. No reintroductions are currently planned. Implementation of the

proposed development ***"may affect, but is not likely to adversely affect"*** the black-footed ferret.

4.2.5.1.2. Ute Ladies'-Tresses Orchid Direct and Indirect Effects

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

Reservoirs are located within ephemeral drainages of Barber Creek. One spring in NWSE of section 12 (T49N,R76W) was surveyed for the orchid. All portions of the project area that could support orchid habitat were surveyed for suitable habitat on August 8, 2007. Suitable orchid habitat is present within the project area at the spring listed above but will not be impacted by the proposed action.

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

4.2.5.2. Sensitive Species Direct and Indirect Effects

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

4.2.5.2.1. Prairie dog colony obligates

Wells, roads, pipelines and other infrastructure associated with energy development constructed within prairie dog colonies will directly remove habitat for prairie dog colony obligate species. Activities that disturb these species could lead to temporary or even long-term or permanent abandonment. Continued loss of prairie dog habitat and active prairie dog towns will result in the decline of numerous sensitive species in the short grass prairie ecosystem.

4.2.5.2.2. Sagebrush obligates

Shrubland and grassland birds are declining faster than any other group of species in North America (Knick et al. 2003). In Wyoming, existing oil and gas wells are located primarily in landscapes dominated by sagebrush, causing direct loss of this habitat. Associated road networks, pipelines, and powerline transmission corridors also influence vegetation dynamics by fragmenting habitats or by creating soil conditions facilitating the spread of invasive species (Braun 1998, Gelbard and Belnap 2003). Density of sagebrush-obligate birds within 100 m of roads constructed for natural gas development in Wyoming was 50% lower than at greater distances (Ingelfinger 2001). Increased numbers of corvids and raptors associated with powerlines (Steenhof et al. 1993, Knight and Kawashima 1993, Vander Haegen et al. 2002) increases the potential predation impact on sage-grouse and other sagebrush-breeding birds (Knick et al. 2003)

Fragmentation of shrubsteppe habitat is a major disruption that has consequences for sagebrush-obligate species (Braun et al. 1976; Rotenberry & Wiens 1980a). In fragmented habitats, suitable habitat area remains only as a remnants surrounded by unusable environments (Urban and Shugart 1984; Fahrig & Paloheimo 1988). Populations of sagebrush-obligate species decline because areas of suitable habitat decrease (Temple & Cary 1988), because of lower reproduction, and/or because of higher mortality in remaining habitats (Robinson 1992; Porneluzi et al. 1993). Fragmentation of shrubsteppe has the further potential to affect the conservation of shrub-obligate species because of the permanence of disturbance (Knick and Rotenberry 1995). Several decades are required to reestablish ecologically functioning mature sagebrush communities. Due to this, sagebrush obligate species may not return even after habitat reestablishment.

Table 4.3 Summary of Sensitive Species Habitat and Project Effects.

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

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

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Plants				
Porter's sagebrush (*Artemisia porteri*)	Sparsely vegetated badlands of ashy or tufaceous mudstone and clay slopes 5300-6500 ft.	NP	NI	Habitat not present.
William's wafer parsnip (*Cymopterus williamsii*)	Open ridgetops and upper slopes with exposed limestone outcrops or rockslides, 6000-8300 ft.	NP	NI	Habitat not present.

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

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

4.2.5.2.3. Bald eagle Direct and Indirect Effects

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 one mile of the project area. The proposed project should not affect bald eagle nesting or winter roosting.

There are 10.9 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 3.7 miles of overhead three-phase distribution lines. There are currently 3.8 miles of improved roads within the project area, with 11.25 miles proposed.

The presence of overhead power lines may impact foraging bald eagles. Bald eagles forage opportunistically throughout the Powder River Basin particularly during the winter when migrant eagles join the small number of resident eagles. Power poles provide attractive perch sites in areas where mature trees and other natural perches are lacking. From May 2003, through 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.

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

Produced water will be stored in 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.

4.2.5.2.4. Black-tailed prairie dog Direct and Indirect Effects

The proposed action will place one well, and increased traffic on established roads, in prairie dog towns. No impoundments are planned on prairie dog towns. Individual prairie dogs will be killed by the proposed action through vehicle strikes, trenching and digging reserve pits. Population level prairie dog impacts are not anticipated. Individuals that survive the excavation process but whose burrows were destroyed will be displaced. As the prairie dog town grows in size, prairie dogs move from an area of high population density to an area of low population density. Male prairie dogs resort to either long-distance dispersal to new colonies (mostly as yearlings, rarely as adults) or short distance within the home colony. Female prairie dogs disperse over long distances to other colonies (as either yearlings or adults). Short-distance dispersal of females within the home colony almost never occurs (Hoogland 1995). Dispersal of prairie dogs occurs as single individuals. Both male and female prairie dogs prefer to move

into an existing colony or one that has been abandoned rather than start a completely new colony. Coterie (small family group within the colony) members resist attempted invasions by conspecifics including immigrants. Dispersing prairie dogs have increased stress levels, higher exposure to predators, and are unlikely to be accepted by other colonies if they even encounter one. Both males and females actively protect their coterie territories from invading males and females (Hoogland 1995).

4.2.5.2.5. Burrowing owl Direct and Indirect Effects

Although no burrowing owls were identified within the project area, they may be present, either breeding or in migration. The dramatic reduction of prairie habitat in the United States has been linked to reduction of burrowing owl populations (Klute et al. 2003). Use of roads and pipeline corridors may increase owl vulnerability to vehicle collision. Overhead power lines provide perch sites for larger raptors that could potentially result in increased burrowing owl predation. CBNG infrastructure such as roads, pipe line corridors, and nearby metering facilities may provide shelter and den sites for ground predators such as skunks and foxes.

The USDAFS Thunder Basin National Grasslands in Campbell County, WY, whom cooperated with the BLM in the creation of the 2003 PRB EIS, recommends a 0.25 mile timing restriction buffer zone for burrowing nest locations during their nesting season (April 15 to August 31). Instruction Memorandum No. 2006-197, directs the field offices to "use the least restrictive stipulations that effectively accomplish the resource objectives or uses." Alteration of the general raptor nest timing limitation (Feb 1 to July 31) to a more specific burrowing owl nesting season timing limitation will effectively reduce the vulnerability of owls to collision while shortening the timing restriction period to four and one half months (See Chapter 3 for breeding, nesting, and migration chronology) from six and one half months and from 0.5 mile to 0.25 mile.

4.2.5.2.6. Grouse

4.2.5.2.6.1. Greater sage-grouse Direct and Indirect Effects

Six greater sage-grouse leks occur within four miles of the project area. The proposed action will adversely impact breeding, nesting, brood rearing, late summer, and winter habitat. Proposed project elements that are anticipated to negatively impact grouse are approximately: 183 CBNG wells on 100 locations (most locations have 2 wells/location), 17 miles of new roads, six miles of new pipelines, 3.7 miles of new overhead power, six new reservoirs, increased vehicle traffic on established roads and increased noise from compressor stations. Using 0.6 miles as a distance for impacts (Holloran et al. 2007, Aldridge and Boyce 2007), effective sage-grouse habitat loss will be 1,420 acres from overhead power, 6,528 acres from roads, and 28,800 acres from 75 well locations. Twenty five of the 100 proposed well locations are associated with existing oil well locations and were not included in the acreage calculation. These numbers are not additive since each well location has an associated road and power and in many cases wells are closer than 0.6 miles to each other. Therefore, the above numbers over-represent anticipated impacts within the project area if totaled, however since most well locations are within 0.6 miles of each other the entire project area (approximately 11,700 acres within the two PODs' boundaries) can be considered affected.

Based on the best available science, which is summarized below, the proposed action will most likely contribute to the extirpation of the local grouse population and subsequent abandonment of the four leks within the project area (Laskie Draw, Laskie Draw East, Barber Creek/South Prong, Watsabaugh IV). The other two leks within four miles (Barlow and Morgan Draw) are separated from the project area by Interstate 90 which may biologically segregate these leks from the four leks within the project area.

Sage-grouse may persist at reduced population levels in the northwestern corner of the project area due to intact and undisturbed habitat that reaches into POD from the northwest. Protection of the Laskie Draw lek and seasonal habitats in the Sections to the north and west of this lek provide the best opportunity for

sage-grouse to persist (nest, raise young, and winter) in the project area. Williams originally proposed 4 well locations that were 0.25 miles from the Laskie Draw lek. As a result of the onsite two of those well locations (34-4 and 21-9) were dropped by the operator.

The Laskie Draw lek is on the western boundary of the project area. This lek has been documented active since 2004 with the exception of 2008. Unlike the other three leks, which are surrounded by existing or approved development, the Laskie Draw lek is on the north-western edge of the majority of existing development. The habitat to the north and west of Laskie Draw lek is relatively intact. The 23-4 well location is situated ¼ mile from the lek and overlooks high quality nesting habitat to the northwest of the lek. Construction and operation of this well will most likely preclude nesting in this habitat.
The operators proposed action included the following measures to minimize impacts to greater sage-grouse (from WLS 2007 wildlife report and surface use plan):

- Suitable habitats will be avoided when possible.
- Minimize the number of new structures that may provide additional raptor perching sites.
- Where possible, roads will be located outside potential sage-grouse nesting areas.
- No construction activities in potential habitat areas within the POD between March 1 and June 15 to minimize stress to and/or displacement of sage-grouse during this critical time.
- Continued lek surveys.
- No overhead power on the Laskie Draw POD.
- Bury all single phase power.
- Corridor utilities with roads.
- Use telemetry on wells.

In addition to the proposed measures above, as a result of the onsite investigations, the operator dropped nine reservoirs and four wells from the proposed action due to sage-grouse habitat. The seventeen project changes to minimize impacts to sage-grouse habitat are listed in Section 2.3.1 of this EA. The operator did not agree to drop the 23-4 well located on BLM surface within 0.25 of the Laskie Draw lek.

Greater sage-grouse Cumulative Effects
In addition to the direct impacts to sage-grouse habitat that will be created by the federal wells and associated infrastructure the project area does contain existing fee, state, and federal fluid mineral development. The sage-grouse cumulative impact assessment area for this project encompasses a four mile radius from the Laskie Draw, Laskie Draw East, Barber Creek/South Prong, and Watsabaugh IV sage-grouse leks. The other two leks within four miles (Barlow and Morgan Draw) are separated from the project area by Interstate 90 which may segregate these leks from the four leks within the project area. There are approximately 340 existing wells and associated infrastructure within four miles of the four leks - an area of 99 square miles. The existing well density is approximately 3.5 wells/section. Due to this level of development there is a strong potential that the population(s) breeding at these leks may become extirpated without the federal development.

There are 315 proposed wells (183 are the wells from this project) within four miles of the four leks. With the addition of the 132 proposed wells that are not associated with this proposed action, the well density within four miles of the four leks increases to 4.7 wells/section. With approval of alternative C (100 proposed well locations) the well density increases to 5.7 wells/section.

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 (WGFD 2004). The PRB FEIS estimated 51,000 additional CBNG wells to be drilled over a ten year period beginning in 2003 (BFO

2003).

The Powder River Basin Oil and Gas Project FEIS (BLM 2003) concluded that "Activities associated with the proposed project would affect sage-grouse in several ways. These effects may include: (1) increased direct mortality (including legal hunting, poaching, and collision with power lines and vehicles); (2) the introduction of new perches for raptors and thus the potential change in rate of predation; (3) direct loss or degradation of habitats; (4) indirect disturbance resulting from human activity (including harassment, displacement, and noise); (5) habitat fragmentation (particularly through construction of roads); and (6) changes in population (pg. 4-257)." The FEIS goes on to state that "implementation of several mitigation measures would reduce the extent of each impact addressed by those measures. Despite these measures, the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its federal listing. Local populations may be extirpated in areas of concentrated development, but viability across the Project Area (Powder River Basin) or the entire range of the species is not likely to be compromised (pg. 4-270)."

The Powder River Basin Oil and Gas Project Record of Decision (BLM 2003) included a Mitigation Monitoring and Reporting Plan (MMRP). The uncertainties as to where and at what level development was to proceed as well as the uncertainties associated with the assumptions that were used to predict impacts suggests that one-time determination of impacts that is included in the EIS may not occur as projected. The MMRP helps to continually assess the effects of the project and the adequacy of the mitigation. Such a plan/process provides a mechanism to continuously modify management practices in order to allow development while continuing to protect the environment (E-1)." In other words, development pace and patterns may not occur as predicted, and so the BLM may use the adaptive management process provided for in the BFO RMP.

Impacts from CBNG development are likely to be significant and additive to the long-term impacts afflicting the sage-grouse population (WGFD 2004). Greater sage-grouse habitat is being directly lost with the addition of well sites, roads, pipelines, powerlines, reservoirs and other infrastructure in the Powder River Basin (WGFD 2005, WGFD 2004). Sage-grouse avoidance of CBNG infrastructure results in even greater indirect habitat loss. In southwestern Wyoming, yearling female greater sage-grouse avoid nesting in areas within 0.6 miles of producing well pads (Holloran et al. 2007), and in southern Alberta, brood-rearing females avoid areas within 0.6 miles of producing wells (Aldridge and Boyce 2007). Doherty et al. (2008) demonstrated that sage-grouse in the Powder River Basin avoided otherwise suitable wintering habitats once they have been developed for energy production, even after timing and lek buffer stipulations had been applied. The 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). As interpreted by coordinated effort with state fish and wildlife agencies from Montana, Colorado, Utah, South Dakota, North Dakota and Wyoming, (State wildlife agencies' ad hoc committee for sage-grouse and oil and gas development 2008), research indicates that oil or gas development exceeding approximately 1 well pad per square mile with the associated infrastructure, results in calculable impacts on breeding populations, as measured by the number of male sage-grouse attending leks (Holloran 2005, Walker et al. 2007)

Noise can affect sage-grouse by preventing vocalizations that influence reproduction and other behaviors (WGFD 2003). In a study of greater sage-grouse population response to natural gas field development in western Wyoming, Holloran (2005) concluded that increased noise intensity, associated with active drilling rigs within 5 km (3.1 miles) of leks, negatively influenced male lek attendance. In 2002, Braun et al. documented approximately 200 CBNG facilities within one mile of sage-grouse leks. Sage-grouse numbers were found to be consistently lower for these leks than for leks without this disturbance. Direct habitat losses from the facilities themselves, roads and traffic, and the associated noise were found to be

the likely reason for this finding.

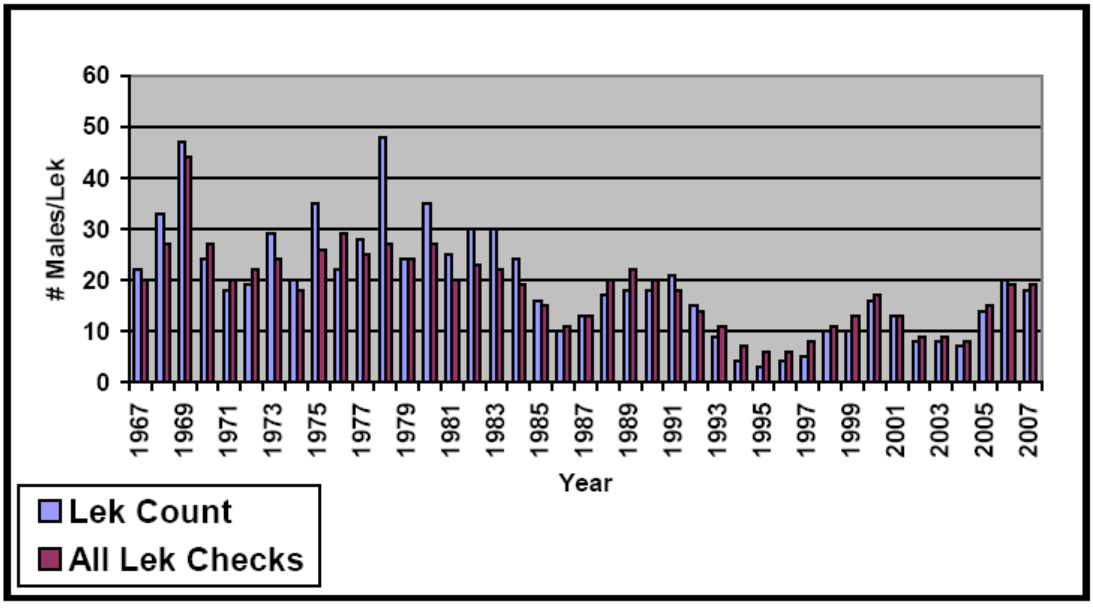
Vegetation communities within the Powder River Basin are naturally fragmented, as they represent a transition between the intermountain basin sagebrush communities to the west and the prairie communities to the east. The Powder River Basin is also near the eastern edge of greater sage-grouse range. A sagebrush cover assessment within Wyoming basins estimated sagebrush coverage within the Powder River Basin to be 35% with an average patch size less than 300 acres (Rowland et al. 2005). The Powder River Basin patch size has decreased by more than 63% in the past forty years, from 820 acre patches and an overall coverage of 41% in 1964 (Rowland et al. 2005).

The existing development within the cumulative impacts assessment area has greatly fragmented the sage-grouse habitat. Disturbance created by this project will contribute to additional fragmentation.

Another concern with CBNG development is that reservoirs created for water disposal provide habitat for mosquitoes associated with West Nile virus (WGFD 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). In northeastern Wyoming and southeastern Montana, West Nile virus-related mortality during the summer resulted in an average decline in annual female survival of 5% from 2003 to 2006 (Walker et al. 2007). Powder River Basin sage-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 sage-grouse population within northeast Wyoming is exhibiting a steady long term downward trend (Figure 1) (WGFD 2005). The figure illustrates a ten-year cycle of periodic highs and lows. Each subsequent population peak is lower than the previous peak. Long-term harvest trends are similar to that of lek attendance (WGFD 2005).

Figure 1. Male sage-grouse lek attendance within northeastern Wyoming, 1967-2007.



The BFO Resource 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)

(BLM 2004). BLM Wyoming adopted the two-mile recommendation in 1990 (BLM 1990). The two-mile recommendation was based on early research which indicated between 59 and 87 percent of sage-grouse nests were located within two miles of a lek (BLM 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 breeding lek (BLM 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 only 36% of their grouse nesting within 3 km of the capture lek. 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. 2007). Habitat conditions and sage-grouse biology within the Buffalo Field Office are more similar to Moynahan's north-central Montana study area than the Upper Green River area.

A two-mile timing limitation, given the long-term population decline and that less than 50% of sage-grouse are expected to nest within the limitation area, is 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. The BLM and University of Montana are currently researching nest location and other sage-grouse questions and relationships between grouse and coalbed natural gas development. Thus far, this research suggests that impacts to leks from energy development are discernable out to a minimum of four miles, and that some leks within this radius have been extirpated as a direct result of energy development (State wildlife agencies' ad hoc committee for sage-grouse and oil and gas development 2008). 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. In a typical landscape in the Powder River Basin, energy development within two miles of leks is projected to reduce the average probability of lek persistence from 87% to 5% percent (Walker et al. 2007).

Walker et al, 2007 indicates the size of a no-development buffer sufficient to protect leks would depend on the amount of suitable habitat around the lek and the population impact deemed acceptable. Also, rather than limiting mitigation to only timing restrictions, research suggests more effective mitigation strategies include, at a minimum, burying power lines (Connelly et al. 2000 b); minimizing road and well pad construction, vehicle traffic, and industrial noise (Lyon and Anderson 2003, Holloran 2005); and managing produced water to prevent the spread of mosquitoes with the potential to vector West Nile Virus in sage grouse habitat (Walker et al 2007).

The multi-state recommendations presented to the WGFD for identification of core sage grouse areas acknowledges there may be times when development in important sage grouse breeding, summer, and winter habitats cannot be avoided. In those instances they recommend, "…infrastructure should be minimized and the area should be managed in a manner that effectively conserves sagebrush habitats (State wildlife agencies' ad hoc committee for sage-grouse and oil and gas development 2008).

4.2.5.2.6.2. Sharp-tailed grouse Direct and Indirect Effects

There were no sharp-tailed grouse found in the project area, although habitat is suitable. The effects of CBNG development to sharp-tailed grouse would be similar to those for greater sage-grouse discussed above.

4.2.5.2.7. Mountain plover Direct and Indirect Effects

Suitable mountain plover habitat is present within the project area. Surveys have been negative to date but will continue to be required in suitable habitat prior to construction. .

Mineral development has mixed effects on mountain plovers. Disturbed ground, such as buried pipeline corridors and roads, may be attractive to plovers, while human activities within one-quarter mile may be disruptive. To reduce impacts to nesting mountain plovers, the BLM BFO requires a 0.25 mile timing limitation for potential nesting habitat prior to nest survey completion and a 0.25 mile timing limitation for all occupied nesting habitat for the entire nesting season.

Use of roads and pipe line corridors by mountain plovers may increase their vulnerability to vehicle collision. Limiting travel speed to 25mph provides drivers an opportunity to notice and avoid mountain plovers and allows mountain plovers sufficient time to escape from approaching vehicles. Even if a nesting plover flushes in time, the nest likely would still be destroyed. Overhead power lines provide perch sites for raptors that could result in increased mountain plover predation. CBNG infrastructure such as well houses, roads, pipeline corridors, and nearby metering facilities may provide shelter and den sites for ground predators such as skunks and foxes.

Mountain plovers have been forced to seek habitat with similar qualities that may be poor quality habitat when loss or alteration of their natural breeding habitat (predominately prairie dog colonies) occurs, such as heavily grazed land, burned fields, fallow agriculture lands, roads, oil and gas well pads and pipelines. These areas could become reproductive sinks. Adult mountain plovers may breed there, lay eggs and hatch chicks; however, the young may not reach fledging age due to the poor quality of the habitat. Recent analysis of the USWFS Breeding Bird Survey (BBS) data suggests that mountain plover populations have declined at an annual rate of 3.7 % over the last 30 years which represents a cumulative decline of 63% during the last 25 years (Knopf and Rupert 1995). 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).

4.2.5.3. Sensitive Species Cumulative effects

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

4.3. West Nile Virus Direct and Indirect Effects

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

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

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

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

4.4. Water Resources

The operator has submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts within the Upper Powder River 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), would reduce project area and downstream impacts from proposed water management strategies. These strategies include storage in infiltration impoundments throughout the South Prong and Schoonover Road units, treatment and discharge to the Powder River through the East Barber Creek treatment facility or via Beaver Creek at the Iberlin Ranch treatment facility, or piping to Midwest for deep injection into the Madison aquifer.

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 13.0 gpm per well or 2379 gpm (5.3 cfs or 3800 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 147,481 acre-feet in 2008 (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 less than 3% of the total volume projected for 2008. This volume of produced water is also within the predicted parameters of the PRB FEIS.

4.4.1. Groundwater

The PRB FEIS predicts an infiltration rate of 40% to groundwater aquifers and coal zones in the Upper Powder River drainage area (PRB FEIS pg 4-5). For this action, it may be assumed that a maximum of 952 gpm will infiltrate at or near the discharge points and impoundments (1530 acre feet per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater used for stock and domestic purposes. According to the PRB FEIS, "…the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater." (PRB FEIS pg 4-54). However, there is potential for infiltration of produced water to influence the quality of the antecedent groundwater. The WDEQ requires that operators determine initial groundwater quality below impoundments to be used for CBNG produced water storage. If high quality water is detected (Class 3 or better) the operator is required to establish a groundwater monitoring program at those impoundments.

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

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004. The Wyoming DEQ has also established an Impoundment Task Force which is in the process of drafting an "Impoundment Monitoring Plan" to investigate the potential for existing impoundments to have impacted shallow ground water. WYPDES permits received by DEQ prior to August 1, 2004, for discharging to impoundments will be

assessed through the "Impoundment Monitoring Plan". For WYPDES permits received by DEQ after August 1, 2004, the BLM will require that operators comply with the requirements outlined in the DEQ compliance monitoring guidance document (June 14, 2004) prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is possible impacts to the groundwater. "The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of wells in the area. The permitted water wells in the area produce from water bearing zones ranging in depth from 300 to 2600 feet below the ground surface. The targeted coal zones range from 1053 to 1590 feet below ground surface for the Big George, 1641 to 2204 for the Wall, and 2236 to 2400 for the lower Wall. As mitigation, the operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence of the proposed wells.

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

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

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

4.4.1.1. Groundwater Cumulative Effects:

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

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

4.4.2.Surface Water

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

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

Predicted Values	**TDS, mg/l**	**SAR**	**EC,** µmhos/cm
Most Restrictive Proposed Limit –		2	1000
Least Restrictive Proposed Limit		10	3200
Powder River at Arvada, WY Gauging station Historic Data Average at Maximum Flow Historic Data Average at Minimum Flow		 4.76 7.83	 1797 3400
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8) Drinking Water (Class I) Agricultural Use (Class II) Livestock Use (Class III)	 500 2,000 5,000	 8	
WDEQ Water Quality Requirement for WYPDES Permit # WY0050857 At discharge point	 5000	 NS**	 7500
Predicted Produced Water Quality Big George Werner Gates/Wall	 1150 1660 1270	 18.7 18.8 16.3	 1790 2650 2010

**NS = Not Specified

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the Powder River Basin is the irrigation of crops (PRB FEIS pg 4-69). The water quality projected for this POD is 1660 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). The operator has reserved the option to direct water produced from this POD to its land south of I-90 for direct land application.

The quality for the water produced from the targeted coal zones from these wells is predicted to be similar to the sample water quality collected from a location near the POD. A maximum of 13.0 gallons per minute (gpm) is projected is to be produced from these 183 wells, for a total of 2379 gpm. See Table 4.5 .

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

There are 10 discharge points, 4 existing and 6 proposed identified 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, 10 impoundments (270 acre feet) have been or would potentially be constructed within the project area. These impoundments will disturb approximately 37 acres including the dam structures. All of these water impoundments are or would be on-channel reservoirs. The existing impoundments have been constructed/upgraded and proposed impoundments will be constructed to meet the requirements of the WSEO, WDEQ and the needs of the operator and the landowner. All water management facilities were evaluated for compliance with best management practices during the onsite.

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow (PRB FEIS pg 4-74). Consequently, the volume of water produced from these wells, if it all went to impoundments, could result in the addition of 0.8 cfs below the lowest reservoir (after infiltration and evapotranspiration losses). The operator has committed to monitor the condition of channels and address any problems resulting from discharge. Discharge from the impoundments will not be allowed without additional analysis. 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 should have occurred 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 wells is anticipated to be a total of 2379 gpm or 5.3 cfs to a combination of impoundments, treatment and direct discharge to the Powder River and deep injection near Midwest. Using an assumed conveyance loss of 20% (PRB FEIS pg 4-74) and full containment the produced water re-surfacing in the Powder River from this action (0.8 cfs) may add a maximum 0.6 cfs to the Upper Powder River flows, or less than 1% 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). 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 did not provide an analysis of the potential development in the watershed above the project area. However, based on the fact that this development is proposed astride the watershed divides between Barber Creek and Dead Horse Creek, very little, if any, additional development is anticipated. The BLM agrees with the operator that full production is not expected to occur because:

1. Some of these wells have already been drilled and are producing.
2. A decline in well discharge generally occurs after several months of operation.

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

The operator has obtained a Wyoming Pollutant Discharge Elimination System (WYPDES) permit, has applied for a second permit, and is in the process of modifying a third, for the discharge of water produced from this project from the WDEQ.

Permit effluent limits were set at (WY0050857 part I page 1):

pH	6.5 to 9
TDS	5000 mg/l max
Specific Conductance	7500 µmhos/cm max
Dissolved iron	1000 µg/l max
Total Barium	1800 µg/l max
Total Arsenic	7 µg/l max
Chlorides	150 mg/l

Permit # WY0048321 set limits as follows in Part I, pages 2 & 3 between September 1, 2008, and

	Daily Max @ Outfall
pH	6.5 to 9
Specific Conductance	1500 µmhos/cm max
Dissolved iron	1000 µg/l max
Total Recoverable Barium	1800 µg/l max
Total Recoverable Arsenic	8.4 µg/l max
Chlorides	150 mg/l
SAR (unitless)	8

The WYPDES permit also addresses existing downstream concerns, such as irrigation use, in the COA for the permit.

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

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

The development of coal bed natural gas and the production and discharge of water may affect the flow rate and/or water quality of the existing natural spring, located in the NENW portion of section 20, township 49 north range 75 west. The operator has committed to evaluate this spring for water flow rate and quality "…prior to starting Federal water production within the project." (WMP page 13)

In-channel downstream impacts are addressed in the WMP for the South Prong Unit 1 & 2 Federal POD and the Laskie POD prepared by Western Land Services for Williams Production, RMT.

4.4.2.1. Surface Water Cumulative Effects

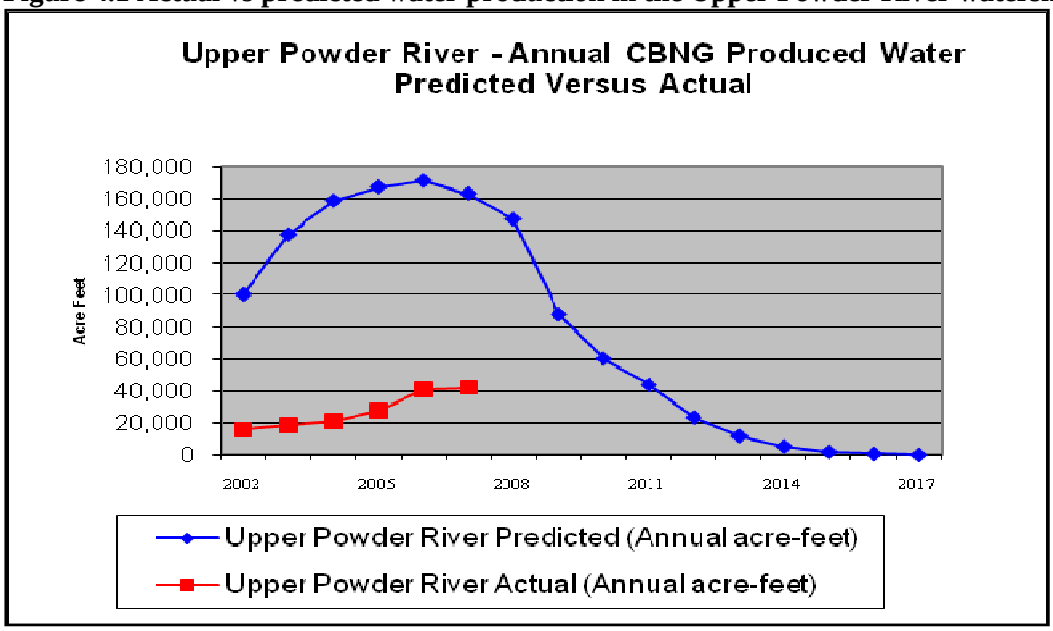
The analysis in this section includes cumulative data from Fee, State and Federal CBNG development in the Upper Powder River watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

As of December 2007, all producing CBNG wells in the Upper Powder River watershed have discharged a cumulative volume of 166,096 acre-ft of water compared to the predicted 900,040 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 19 % 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 *2007 Data Update 3-08-08*

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2002	100,512	100,512	15,846	15.8	15,846	15.8
2003	137,942	238,454	18,578	13.5	34,424	14.4
2004	159,034	397,488	20,991	13.2	55,414	13.9
2005	167,608	565,096	27,640	16.5	83,054	14.7
2006	171,423	736,519	40,930	23.9	123,984	16.8
2007	163,521	900,040	42,112	25.8	166,096	18.5
2008	147,481	1,047,521				
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				
Total	1,285,233		166,096			

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



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

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. However, this MOC has expired and has not been renewed. The EPA has approved the Montana Surface Water Standards for EC and SAR and as such the WDEQ is responsible for ensuring that the Montana standards are met at the state line under the Clean Water Act (CWA). 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) At this time, however, litigation between Wyoming and Montana may be the main factor which determines the water flow and quality parameters for production and discharge CBNG by-product water

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

1. They are proportional to the actual amount of cumulatively produced water in the Upper Powder River drainage and the total amount that was predicted in the PRB FEIS, which is only approximately 19% 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

Sites 48CA5034, 48CA5038, 48CA5041, 48CA6509, and 48CA6510, will be impacted by the project; however all are considered not eligible to the NRHP. No historic properties exist in the area of potential effect. On 7/21/08, the Bureau electronically notified the Wyoming State Historic Preservation Office (SHPO), following section VI(A)(1) of the Wyoming State Protocol, of a finding of no effect to historic properties for the proposed project.

An adequate Class III survey could not be conducted in portions of the project area due to dense vegetation. To protect potential cultural resources within these areas, a Class III survey must be conducted prior to surface disturbance in the un-surveyed areas, which are as follows:

12-10-4976 well: center of survey block, as well as road and pipeline corridor
13-14-4976 well: center of survey block
12-15-4976 well: drainage bottoms in survey block
41-15-4976 well: southeast corner of survey block
43-23-4976 well: north and west sides of survey block

21-23-4976 well: east end of linear survey
Proposed pipeline in T49N T76W Section 23 SW SE: entire linear corridor

If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the *Standard COA* (General)(A)(1).

4.6. Visual Resources

The cumulative impact to visual resources would be increased by wells and pads, access roads, utility corridors, and impoundments added with this project. The access roads and utility corridors create linear contrasts with the natural lines and colors and the well pads and boxes contrast with the natural forms. The facilities within the Class II area will generally be visible for a short period of time, with the exception of an access road/utility corridor that runs from the Interstate corridor north to the 12-23-4976 well and continuing north. Within the Class III area, there is an existing utility corridor approximately 350 feet from the Interstate that will be extended and widened by this project.

General visual resource mitigation measures applied at the onsite and required in the BLM conditions of approval will reduce the visual impact from well pads, roads, and impoundments. This mitigation includes:

- Constructing pads to appear as natural clearings by rounding corners of pads and feathering the vegetation edge.
- Removal of construction debris immediately within the Class II area.
- Where feasible, roads within the one-mile corridor along Interstate 90 are not to be surfaced.
- Shaping cuts and fills to appear as natural forms.
- Applying erosion control measures during and after construction to reduce visual contrast.
- Seeding areas where there is high contrast of texture and color.
- Well boxes and all ancillary facilities should be painted covert green, using non-reflective paint.

5. CONSULTATION/COORDINATION

Contact	Title	Organization	Present at Onsite
Mary Hopkins	Interim WY SHPO	Wyoming SHPO	No
Patrick Barker	Project Manager	Western Land Services	Yes
Peggy Carter	Hydrologist	Williams Production RMT	Yes
Allen Jones	Hydrologist	Western Land Services	Yes
Allen Aksamit	Wildlife Biologist	Western Land Services	Yes
Helen Jones	Landowner		Yes
Dave Belus	Landowner		Yes
Jerry Record	Landowner		Yes
Steve Record	Landowner		Yes
Mike Record	Landowner		Yes
Richard Jarvis	Land Manager	Williams Production RMT	Yes
Randee Jespersen	Land Manager	Williams Production RMT	Yes
Jim Mobley	Construction	Williams Production RMT	Yes
Kelly Preut	Drilling	Williams Production RMT	Yes
Penny Bellah	Regulatory Team Lead	Williams Production RMT	Yes
Rex Lynde	Drilling	Williams Production RMT	Yes
Jerry Means	Contract Engineer	Magma	Yes

Contact	Title	Organization	Present at Onsite
Ralph Demel	Construction	Williams Production RMT	Yes
Justin Clyde	Construction	Williams Production RMT	Yes
Shireen Walker	Procurement	Williams Production RMT	Yes
Gabe Gill	Drilling	Williams Production RMT	Yes
Duane Joslyn	Production	Williams Production RMT	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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