FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Windsor Energy
Jepson Draw II
ENVIRONMENTAL ASSESSMENT –WY-070-07-109

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Windsor Energy's Jepson Draw IICoal Bed Natural Gas (CBNG) POD comprised of the following 82 Applications for Permit to Drill (APDs), as follows:

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease #
1	JEPSON DRAW II FEDERAL BG	21-32	NENW	32	45N	77W	WYW130107
2	JEPSON DRAW II FEDERAL BG	12-04*	SWNW	4	44N	77W	WYW140146
3	JEPSON DRAW II FEDERAL BG	21-04	NENW	4	44N	77W	WYW140146
4	JEPSON DRAW II FEDERAL BG	32-32	SWNE	32	45N	77W	WYW140145
5	JEPSON DRAW II FEDERAL BG	41-32	NENE	32	45N	77W	WYW140145
6	JEPSON DRAW II STREETER BG	14-04	SWSW	4	44N	77W	WYW140146
7	JEPSON DRAW II STREETER BG	23-04	NESW	4	44N	77W	WYW140146
8	JEPSON DRAW II STREETER BG	43-05	NESE	5	44N	77W	WYW0312471A
9	JEPSON DRAW II STREETER BG	12-05	SWNW	5	44N	77W	WYW0312471A
10	JEPSON DRAW II STREETER BG	14-05	SWSW	5	44N	77W	WYW0312471A
11	JEPSON DRAW II STREETER BG	21-05	NENW	5	44N	77W	WYW37098
12	JEPSON DRAW II STREETER BG	23-05	NESW	5	44N	77W	WYW0312471A
13	JEPSON DRAW II STREETER BG	32-05	SWNE	5	44N	77W	WYW0312471A
14	JEPSON DRAW II STREETER BG	34-05	SWSE	5	44N	77W	WYW0312471A
15	JEPSON DRAW II STREETER BG	41-05	NENE	5	44N	77W	WYW140146
16	JEPSON DRAW II STREETER BG	12-06	SWNW	6	44N	77W	WYW46783
17	JEPSON DRAW II STREETER BG	41-06	NENE	6	44N	77W	WYW46783
18	JEPSON DRAW II STREETER BG	14-06	SWSW	6	44N	77W	WYW46783
19	JEPSON DRAW II STREETER BG	21-06	NENW	6	44N	77W	WYW46783
20	JEPSON DRAW II STREETER BG	23-06	NESW	6	44N	77W	WYW46783
21	JEPSON DRAW II STREETER BG	32-06	SWNE	6	44N	77W	WYW46783
22	JEPSON DRAW II STREETER BG	34-06	SWSE	6	44N	77W	WYW46783
23	JEPSON DRAW II STREETER BG	43-06	NESE	6	44N	77W	WYW46783
24	JEPSON DRAW II STREETER BG	12-07	SWNW	7	44N	77W	WYW139688
25	JEPSON DRAW II STREETER BG	32-07	SWNE	7	44N	77W	WYW128459
26	JEPSON DRAW II STREETER BG	41-07	NENE	7	44N	77W	WYW128459
27	JEPSON DRAW II STREETER BG	21-07	NENW	7	44N	77W	WYW139688
28	JEPSON DRAW II STREETER BG	34-07	SWSE	7	44N	77W	WYW139689
29	JEPSON DRAW II STREETER BG	43-07	NESE	7	44N	77W	WYW139689
30	JEPSON DRAW II STREETER BG	12-08	SWNW	8	44N	77W	WYW47511
31	JEPSON DRAW II STREETER BG	14-08	SWSW	8	44N	77W	WYW47511
32	JEPSON DRAW II STREETER BG	21-08	NENW	8	44N	77W	WYW47511
33	JEPSON DRAW II STREETER BG	23-08	NESW	8	44N	77W	WYW47511
34	JEPSON DRAW II STREETER BG	32-08	SWNE	8	44N	77W	WYW47511
35	JEPSON DRAW II STREETER BG	34-08	SWSE	8	44N	77W	WYW47511
36	JEPSON DRAW II STREETER BG	41-08	NENE	8	44N	77W	WYW47511
37	JEPSON DRAW II STREETER BG	43-08	NESE	8	44N	77W	WYW47511
38	JEPSON DRAW II STREETER BG	32-01	SWNE	1	44N	78W	WYW119419

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease #
39	JEPSON DRAW II STREETER BG	41-01	NENE	1	44N	78W	WYW119419
40	JEPSON DRAW II STREETER BG	12-19	SWNW	19	45N	77W	WYW0312442
41	JEPSON DRAW II STREETER BG	14-19	SWSW	19	45N	77W	WYW0312442
42	JEPSON DRAW II STREETER BG	21-19	NENW	19	45N	77W	WYW0312442
43	JEPSON DRAW II STREETER BG	23-19	NESW	19	45N	77W	WYW0312442
44	JEPSON DRAW II STREETER BG	32-19	SWNE	19	45N	77W	WYW0312442
45	JEPSON DRAW II STREETER BG	34-19	SWSE	19	45N	77W	WYW0312442
46	JEPSON DRAW II STREETER BG	41-19	NENE	19	45N	77W	WYW0312442
47	JEPSON DRAW II STREETER BG	43-19	NESE	19	45N	77W	WYW0312442
48	JEPSON DRAW II STREETER BG	14-29	SWSW	29	45N	77W	WYW0312441
49	JEPSON DRAW II STREETER BG	12-29	SWNW	29	45N	77W	WYW140144
50	JEPSON DRAW II STREETER BG	21-29	NENW	29	45N	77W	WYW140144
51	JEPSON DRAW II STREETER BG	23-29	NESW	29	45N	77W	WYW140144
52	JEPSON DRAW II STREETER BG	12-30	SWNW	30	45N	77W	WYW0312441
53	JEPSON DRAW II STREETER BG	32-30	SWNE	30	45N	77W	WYW0312441
54	JEPSON DRAW II STREETER BG	41-30	NENE	30	45N	77W	WYW0312441
55	JEPSON DRAW II STREETER BG	14-30	SWSW	30	45N	77W	WYW0312441
56	JEPSON DRAW II STREETER BG	21-30	NENW	30	45N	77W	WYW0312441
57	JEPSON DRAW II STREETER BG	23-30	NESW	30	45N	77W	WYW0312441
58	JEPSON DRAW II STREETER BG	34-30	SWSE	30	45N	77W	WYW0312441
59	JEPSON DRAW II STREETER BG	43-30	NESE	30	45N	77W	WYW0312441
60	JEPSON DRAW II STREETER BG	14-31	SWSW	31	45N	77W	WYW46779
61	JEPSON DRAW II STREETER BG	23-31	NESW	31	45N	77W	WYW46779
62	JEPSON DRAW II STREETER BG	32-31	SWNE	31	45N	77W	WYW46781
63	JEPSON DRAW II STREETER BG	34-31	SWSE	31	45N	77W	WYW47513
64	JEPSON DRAW II STREETER BG	41-31	NENE	31	45N	77W	WYW46781
65	JEPSON DRAW II STREETER BG	43-31	NESE	31	45N	77W	WYW47513
66	JEPSON DRAW II STREETER BG	12-32	SWNW	32	45N	77W	WYW130107
67	JEPSON DRAW II STREETER BG	14-32	SWSW	32	45N	77W	WYW0312442
68	JEPSON DRAW II STREETER BG	23-32	NESW	32	45N	77W	WYW0312442
69	JEPSON DRAW II STREETER BG	34-32	SWSE	32	45N	77W	WYW0312442
70	JEPSON DRAW II STREETER BG	43-32	NESE	32	45N	77W	WYW140145
71	JEPSON DRAW II STREETER BG	14-24	SWSW	24	45N	78W	WYW58399
72	JEPSON DRAW II STREETER BG	21-24	NENW	24	45N	78W	WYW58399
73	JEPSON DRAW II STREETER BG	31-24	NWNE	24	45N	78W	WYW58399
74	JEPSON DRAW II STREETER BG	41-24	NENE	24	45N	78W	WYW58399
75	JEPSON DRAW II STREETER BG	43-24	NESE	24	45N	78W	WYW58399
76	JEPSON DRAW II STREETER BG	23-24	NESW	24	45N	78W	WYW58399
77	JEPSON DRAW II STREETER BG	34-24	SWSE	24	45N	78W	WYW58399
78	JEPSON DRAW II STREETER BG	12-24	SWNW	24	45N	78W	WYW58399
79	JEPSON DRAW II STREETER BG	32-25	SWNE	25	45N	78W	WYW58399
80	JEPSON DRAW II STREETER BG	34-25	SWSE	25	45N	78W	WYW58399
81	JEPSON DRAW II STREETER BG	41-25	NENE	25	45N	78W	WYW58399
82	JEPSON DRAW II STREETER BG	43-25	NESE	25	45N	78W	WYW58399

	IMPOUNDMENT NAME	QTR QTR	SEC	TWP	RNG	MINERAL LEASE	ASSOCIATED OUTFALL
1	Alley	NWNE	24	45N	78W	WYW58399	WY00-022
2	Avenue	NESE	30	45N	77W	WYW0312441	WY00-018
3	Botieff 21-25-4578	NENW	25	45N	78W	Fee	WY00-027
4	Boulevard	SESE	24	45N	78W	WYW58399	WY00-026
5	Bourbon	SESE	31	45N	77W	WYW47513	WY00-013
6	Busy	NESE	24	45N	78W	WYW58399	WY00-020
7	Crash	NWNW	24	45N	78W	WYW58399	WY00-023
8	Cupa Joe	NWNE	6	44N	77W	WYW46783	WY00-012
9	First	NENW	19	45N	77W	WYW0312442	WY00-019
10	Hammer	SESW	32	45N	77W	WYW0312442	WY00-010
11	Juggernaught	SWSW	30	45N	77W	WYW0312441	WY00-017
12	Lane	NWSW	24	45N	78W	WYW58399	WY00-024
13	Lostra 21-25-4578	NENW	25	45N	78W	Fee	WY00-028
14	Main	SESW	24	45N	78W	WYW58399	WY00-025
15	Old Murphy	NENW	31	45N	77W	WYW46782	WY00-015
16	Paved	SENW	32	45N	77W	WYW130107	WY00-008
17	RGR	SESW	30	45N	77W	WYW0312441	WY00-016
18	Roundabout	SWSW	29	45N	77W	WYW0312441	WY00-030
19	Shadow Caster	SWNE	31	45N	77W	WYW46781	WY00-014
20	Shakedown	NWSE	32	45N	77W	WYW0312442	WY00-007
21	Side	NWNW	19	45N	77W	WYW0312442	WY00-021
22	Teabag	NENE	6	44N	77W	WYW46783	WY00-011
23	Wall	SWNW	32	45N	77W	WYW130107	WY00-009
24	Whimper	NWSW	4	44N	77W	WYW140146	WY00-006
25	Zipper	NWSE	5	44N	77W	WYW312471A	WY00-031
26	Jepson #2	NWSE	26	45	78	Fee	WY00-001

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

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

1. The Operator, in their POD, has committed to:
    - Comply with all applicable Federal, State and Local laws and regulations.
    - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
    - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD.
    - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowner(s).
3. Alternative C will not result in any undue or unnecessary environmental degradation.

4. It is in the public interest to approve these wells, as the leases are being drained of federal gas, resulting in a loss of revenue for the government.
5. Mitigation measures applied by the BLM will alleviate or minimize environmental impacts.
6. Alternative C is the environmentally-preferred Alternative.
7. The proposed action is in conformance with the PRB FEIS and the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management (BLM), Buffalo Field Office, April 2001.

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

ADMINISTRATIVE REVIEW AND APPEAL: Under BLM regulations, this decision is subject to administrative review in accordance with 43 CFR 3165. Any request for administrative review of this decision must include information required under 43 CFR 3165.3(b) (State Director Review), including all supporting documentation. Such a request must be filed in writing with the State Director, Bureau of Land Management, P.O. Box 1828, Cheyenne, Wyoming 82003, no later than 20 business days after this Decision Record is received or considered to have been received.

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

Field Manager:_____ Date: _____

BUREAU OF LAND MANAGEMENT
BUFFALO FIELD OFFICE
ENVIRONMENTAL ASSESSMENT (EA)
FOR
Windsor Energy
Jepson Draw II
PLAN OF DEVELOPMENT
WY-070-07-109

INTRODUCTION

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

1. PURPOSE AND NEED

The purpose for the proposal is to quantify reserves and produce coal bed natural gas (CBNG) on 18 valid federal oil and gas mineral leases issued to the applicant by the BLM. The need exists because without approval of the Applications for Permit to Drill (APDs), federal lease royalties will be lost and the lessee will be deprived of the federal gas they have the rights to develop.

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

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

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative A - No Action

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

2.2. Alternative B Proposed Action

Proposed Action Title/Type: Windsor Energy's Jepson Draw II Plan of Development (POD) for 82 coal bed natural gas well APD`s and associated infrastructure.

Proposed Well Information: There are 82 wells proposed within this POD, as follows:

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease #
1	JEPSON DRAW II FEDERAL BG	21-32	NENW	32	45N	77W	WYW130107
2	JEPSON DRAW II FEDERAL BG	12-04*	SWNW	4	44N	77W	WYW140146
3	JEPSON DRAW II FEDERAL BG	21-04	NENW	4	44N	77W	WYW140146
4	JEPSON DRAW II FEDERAL BG	32-32	SWNE	32	45N	77W	WYW140145
5	JEPSON DRAW II FEDERAL BG	41-32	NENE	32	45N	77W	WYW140145
6	JEPSON DRAW II STREETER BG	14-04	SWSW	4	44N	77W	WYW140146
7	JEPSON DRAW II STREETER BG	23-04	NESW	4	44N	77W	WYW140146
8	JEPSON DRAW II STREETER BG	43-05	NESE	5	44N	77W	WYW0312471A
9	JEPSON DRAW II STREETER BG	12-05	SWNW	5	44N	77W	WYW0312471A
10	JEPSON DRAW II STREETER BG	14-05	SWSW	5	44N	77W	WYW0312471A
11	JEPSON DRAW II STREETER BG	21-05	NENW	5	44N	77W	WYW37098
12	JEPSON DRAW II STREETER BG	23-05	NESW	5	44N	77W	WYW0312471A
13	JEPSON DRAW II STREETER BG	32-05	SWNE	5	44N	77W	WYW0312471A
14	JEPSON DRAW II STREETER BG	34-05	SWSE	5	44N	77W	WYW0312471A
15	JEPSON DRAW II STREETER BG	41-05	NENE	5	44N	77W	WYW140146
16	JEPSON DRAW II STREETER BG	12-06	SWNW	6	44N	77W	WYW46783
17	JEPSON DRAW II STREETER BG	41-06	NENE	6	44N	77W	WYW46783
18	JEPSON DRAW II STREETER BG	14-06	SWSW	6	44N	77W	WYW46783
19	JEPSON DRAW II STREETER BG	21-06	NENW	6	44N	77W	WYW46783
20	JEPSON DRAW II STREETER BG	23-06	NESW	6	44N	77W	WYW46783
21	JEPSON DRAW II STREETER BG	32-06	SWNE	6	44N	77W	WYW46783
22	JEPSON DRAW II STREETER BG	34-06	SWSE	6	44N	77W	WYW46783
23	JEPSON DRAW II STREETER BG	43-06	NESE	6	44N	77W	WYW46783
24	JEPSON DRAW II STREETER BG	12-07	SWNW	7	44N	77W	WYW139688
25	JEPSON DRAW II STREETER BG	32-07	SWNE	7	44N	77W	WYW128459
26	JEPSON DRAW II STREETER BG	41-07	NENE	7	44N	77W	WYW128459
27	JEPSON DRAW II STREETER BG	21-07	NENW	7	44N	77W	WYW139688
28	JEPSON DRAW II STREETER BG	34-07	SWSE	7	44N	77W	WYW139689
29	JEPSON DRAW II STREETER BG	43-07	NESE	7	44N	77W	WYW139689
30	JEPSON DRAW II STREETER BG	12-08	SWNW	8	44N	77W	WYW47511
31	JEPSON DRAW II STREETER BG	14-08	SWSW	8	44N	77W	WYW47511
32	JEPSON DRAW II STREETER BG	21-08	NENW	8	44N	77W	WYW47511
33	JEPSON DRAW II STREETER BG	23-08	NESW	8	44N	77W	WYW47511
34	JEPSON DRAW II STREETER BG	32-08	SWNE	8	44N	77W	WYW47511
35	JEPSON DRAW II STREETER BG	34-08	SWSE	8	44N	77W	WYW47511
36	JEPSON DRAW II STREETER BG	41-08	NENE	8	44N	77W	WYW47511
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38	JEPSON DRAW II STREETER BG	32-01	SWNE	1	44N	78W	WYW119419
39	JEPSON DRAW II STREETER BG	41-01	NENE	1	44N	78W	WYW119419
40	JEPSON DRAW II STREETER BG	12-19	SWNW	19	45N	77W	WYW0312442
41	JEPSON DRAW II STREETER BG	14-19	SWSW	19	45N	77W	WYW0312442
42	JEPSON DRAW II STREETER BG	21-19	NENW	19	45N	77W	WYW0312442
43	JEPSON DRAW II STREETER BG	23-19	NESW	19	45N	77W	WYW0312442
44	JEPSON DRAW II STREETER BG	32-19	SWNE	19	45N	77W	WYW0312442
45	JEPSON DRAW II STREETER BG	34-19	SWSE	19	45N	77W	WYW0312442
46	JEPSON DRAW II STREETER BG	41-19	NENE	19	45N	77W	WYW0312442
47	JEPSON DRAW II STREETER BG	43-19	NESE	19	45N	77W	WYW0312442

	Well Name	Well #	QTR	Sec	TWP	RNG	Lease #
48	JEPSON DRAW II STREETER BG	14-29	SWSW	29	45N	77W	WYW0312441
49	JEPSON DRAW II STREETER BG	12-29	SWNW	29	45N	77W	WYW140144
50	JEPSON DRAW II STREETER BG	21-29	NENW	29	45N	77W	WYW140144
51	JEPSON DRAW II STREETER BG	23-29	NESW	29	45N	77W	WYW140144
52	JEPSON DRAW II STREETER BG	12-30	SWNW	30	45N	77W	WYW0312441
53	JEPSON DRAW II STREETER BG	32-30	SWNE	30	45N	77W	WYW0312441
54	JEPSON DRAW II STREETER BG	41-30	NENE	30	45N	77W	WYW0312441
55	JEPSON DRAW II STREETER BG	14-30	SWSW	30	45N	77W	WYW0312441
56	JEPSON DRAW II STREETER BG	21-30	NENW	30	45N	77W	WYW0312441
57	JEPSON DRAW II STREETER BG	23-30	NESW	30	45N	77W	WYW0312441
58	JEPSON DRAW II STREETER BG	34-30	SWSE	30	45N	77W	WYW0312441
59	JEPSON DRAW II STREETER BG	43-30	NESE	30	45N	77W	WYW0312441
60	JEPSON DRAW II STREETER BG	14-31	SWSW	31	45N	77W	WYW46779
61	JEPSON DRAW II STREETER BG	23-31	NESW	31	45N	77W	WYW46779
62	JEPSON DRAW II STREETER BG	32-31	SWNE	31	45N	77W	WYW46781
63	JEPSON DRAW II STREETER BG	34-31	SWSE	31	45N	77W	WYW47513
64	JEPSON DRAW II STREETER BG	41-31	NENE	31	45N	77W	WYW46781
65	JEPSON DRAW II STREETER BG	43-31	NESE	31	45N	77W	WYW47513
66	JEPSON DRAW II STREETER BG	12-32	SWNW	32	45N	77W	WYW130107
67	JEPSON DRAW II STREETER BG	14-32	SWSW	32	45N	77W	WYW0312442
68	JEPSON DRAW II STREETER BG	23-32	NESW	32	45N	77W	WYW0312442
69	JEPSON DRAW II STREETER BG	34-32	SWSE	32	45N	77W	WYW0312442
70	JEPSON DRAW II STREETER BG	43-32	NESE	32	45N	77W	WYW140145
71	JEPSON DRAW II STREETER BG	14-24	SWSW	24	45N	78W	WYW58399
72	JEPSON DRAW II STREETER BG	21-24	NENW	24	45N	78W	WYW58399
73	JEPSON DRAW II STREETER BG	31-24	NWNE	24	45N	78W	WYW58399
74	JEPSON DRAW II STREETER BG	41-24	NENE	24	45N	78W	WYW58399
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76	JEPSON DRAW II STREETER BG	23-24	NESW	24	45N	78W	WYW58399
77	JEPSON DRAW II STREETER BG	34-24	SWSE	24	45N	78W	WYW58399
78	JEPSON DRAW II STREETER BG	12-24	SWNW	24	45N	78W	WYW58399
79	JEPSON DRAW II STREETER BG	32-25	SWNE	25	45N	78W	WYW58399
80	JEPSON DRAW II STREETER BG	34-25	SWSE	25	45N	78W	WYW58399
81	JEPSON DRAW II STREETER BG	41-25	NENE	25	45N	78W	WYW58399
82	JEPSON DRAW II STREETER BG	43-25	NESE	25	45N	78W	WYW58399

	IMPOUNDMENT NAME	QTR QTR	SEC	TWP	RNG	MINERAL LEASE	ASSOCIATED OUTFALL
1	Alley	NWNE	24	45N	78W	WYW58399	WY00-022
2	Avenue	NESE	30	45N	77W	WYW0312441	WY00-018
3	Botieff 21-25-4578	NENW	25	45N	78W	Fee	WY00-027
4	Boulevard	SESE	24	45N	78W	WYW58399	WY00-026
5	Bourbon	SESE	31	45N	77W	WYW47513	WY00-013
6	Busy	NESE	24	45N	78W	WYW58399	WY00-020
7	Crash	NWNW	24	45N	78W	WYW58399	WY00-023
8	Cupa Joe	NWNE	6	44N	77W	WYW46783	WY00-012
9	First	NENW	19	45N	77W	WYW0312442	WY00-019

10	Hammer	SESW	32	45N	77W	WYW0312442	WY00-010
11	Juggernaught	SWSW	30	45N	77W	WYW0312441	WY00-017
12	Lane	NWSW	24	45N	78W	WYW58399	WY00-024
13	Lostra 21-25-4578	NENW	25	45N	78W	Fee	WY00-028
14	Main	SESW	24	45N	78W	WYW58399	WY00-025
15	Old Murphy	NENW	31	45N	77W	WYW46782	WY00-015
16	Paved	SENW	32	45N	77W	WYW130107	WY00-008
17	RGR	SESW	30	45N	77W	WYW0312441	WY00-016
18	Roundabout	SWSW	29	45N	77W	WYW0312441	WY00-030
19	Shadow Caster	SWNE	31	45N	77W	WYW46781	WY00-014
20	Shakedown	NWSE	32	45N	77W	WYW0312442	WY00-007
21	Side	NWNW	19	45N	77W	WYW0312442	WY00-021
22	Teabag	NENE	6	44N	77W	WYW46783	WY00-011
23	Wall	SWNW	32	45N	77W	WYW130107	WY00-009
24	Whimper	NWSW	4	44N	77W	WYW140146	WY00-006
25	Zipper	NWSE	5	44N	77W	WYW312471A	WY00-031
26	Jepson #2	NWSE	26	45	78	Fee	WY00-001

County: Johnson

Applicant: Windsor Energy

Surface Owners: BLM, Ed Streeter

Project Description:
The proposed action involves the following:

- Drilling of 82 total federal CBM wells in the Big George, Edgerton, Kaycee and Midwest coal zones to depths averaging 1371 feet.

- An unimproved and improved road network.

- A Water Management Plan (WMP) that involves the following infrastructure and strategy: 26 discharge points with 25 proposed and 1 existing stock water reservoirs within the Upper Powder River watershed

- A buried gas, water and a power line network that consists of buried and above-ground infrastructure.

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(WMP) in the POD and individual APDs. Also see the subject POD and/or APDs for maps showing the proposed well locations and associated facilities described above. More information on CBNG well drilling, production and standard practices is also available in the PRB FEIS, Volume 1, pages 2-9 through 2-40 (January 2003).

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

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

1. Comply with all applicable Federal, State and Local laws and regulations.
2. Obtain the necessary permits for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
3. 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 Landowner.

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. At the on-sites, all areas of proposed surface disturbance were inspected to reduce potential impacts to natural resources. In some cases, access roads were re-routed, and well locations, pipelines, discharge points and other water management control structures were moved, modified, mitigated or dropped from further consideration to alleviate or minimize environmental impacts. Alternatives to the different aspects of the proposed action are always considered and applied as pre-approval changes, site specific mitigation and/or Conditions of Approval (COAs), if they will alleviate environmental effects of the operator's proposal. The specific changes identified for the Jepson Draw II POD are listed below under 2.3.1:

2.3.1. Changes as a result of the on-sites

Well	Section	Aliquot	T	R	Onsite Notes
12-04BG*	4	SWNW	44N	77W	main access rerouted to stay out of drainages
34-32BG	32	SWSE	45N	77W	reserve pit moved W away from drainage
32-32BG	32	SWNE	45N	77W	location moved, proximity to raptor nest, sand blowout soil concerns w/ reclamation, new location requires no dirt work
41-32BG	32	NENE	45N	77W	location moved due to proximity to raptor nest, monitoring mitigation applied.
21-05BG	5	NENW	44N	77W	location/access moved to reduce impacts to sage-grouse habitat
23-05BG	5	NESW	44N	77W	location moved, due to proximity to drainage and narrow ridge
41-05BG	5	NENE	44N	77W	location moved due to not enough room for drill rig
23-06BG	6	NESW	44N	77W	access/utilities rerouted to skirt sandy knob
34-06BG	6	SWSE	44N	77W	access rerouted to corridor w/ utilities from main rd
21-07BG	7	NENW	44N	77W	access/utilities rerouted to come in from 34-06 location
43-07BG	7	NESE	44N	77W	main access has been rerouted to come in from S using existing Fee development/2TK
43-08BG	8	NESE	44N	77W	utilities rerouted to run below dam
32-01BG	1	SWNE	44N	78W	access rerouted coming in from N on state using existing 2TK, utilities going NE to 41-01location,
41-01BG	1	NENE	44N	78W	access/utilities rerouted to corridor existing pipeline then turn E to 14-31 location, will alleviate several drainage crossings, LWCs and major dirt wk
32-19BG	19	SWNE	45N	77W	access - rerouted to minimize disturbance from required dirt work

Well	Section	Aliquot	T	R	Onsite Notes
34-19BG	19	SWSE	45N	77W	location moved to plugged and abandoned conventional site, due to raptor nest location
21-29BG	29	NENW	45N	77W	access rerouted to skirt hill and eliminate required dirt work
21-30BG	30	NENW	45N	77W	access rerouted, to eliminate required dirt work off of steep ridge line, location moved ~20' W to get back from drainage
32-30BG	30	SWNE	45N	77W	access rerouted no dirt work for new access
32-31BG	31	SWNE	45N	77W	location moved due to 60' LWC would be required, conventional well access/location will be used for CBM location
43-31BG	31	NESE	45N	77W	location moved ~30'W due to proximity to drainage,
12-32BG	32	SWNW	45N	77W	access rerouted, no dirt work for new access
14-32BG	32	SWSW	45N	77W	pit moved E away from drainage
23-24BG	24	NESW	45N	78W	access rerouted around sandy knob
41-24BG	24	NENE	45N	78W	well moved proposed location in drainage
34-25BG	25	SWSE	45N	78W	access rerouted to minimize dirt work
41-25BG	25	NENE	45N	78W	access/utilities rerouted to corridor existing pipeline crossings, LWCs and major dirt wk
14-24BG	24	SWSW	45N	87W	access rerouted to use existing conventional well access

Water Management

The following suggestions/recommendations were made regarding specific dams:

Reservoir	Aliquot	Sec	Twp	Rng	Notes
Crash	NWNW	24	45N	78W	The water line to its outfall will be moved from where it was staked to the area of present disturbance
Alley	NWNE	24	45N	78W	It was suggested that this dam be moved downstream in order to incorporate the 3-4 foot headcut into the embankment
Main	SESW	24	45N	78W	Because of its size, it should be built in such a way as to incorporate the downstream 5 foot headcut into the embankment
Busy	NESE	24	45N	78W	Dam should incorporate headcut into embankment
First Dam	NENW	19	45N	77W	Because of a narrow right flank, it was suggested that the dam could be angled and/or moved upstream about 200 or more feet
Shadow Caster	SWNE	31	45N	77W	May have to be moved downstream a short distance so that expected high water line of reservoir does not inundated a power pole
Avenue	NESE	30	45N	77W	Should be built so headcut downstream of toe is incorporated into dam's embankment
Bourbon	SESE	31	45N	77W	Headcut downstream should be incorporated into embankment
Hammer	SESW	32	45N	77W	This dam's outfall should be moved closer to the reservoir's expected high water line to reduce erosion

2.3.2. Programmatic mitigation measures identified in the PRB FEIS ROD

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

2.3.2.1. Groundwater

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

2.3.2.2. Surface Water

1. Channel Crossings:
   a) Minimize channel disturbance as much as possible by limiting pipeline and road crossings.
   b) Avoid running pipelines and access roads within floodplains or parallel to a stream channel.
   c) Channel crossings by road and pipelines will be constructed perpendicular to flow. Culverts will be installed at appropriate locations for streams and channels crossed by roads as specified in the BLM Manual 9112-Bridges and Major Culverts and Manual 9113-Roads. Streams will be crossed perpendicular to flow, where possible, and all stream crossing structures will be designed to carry the 25-year discharge event or other capacities as directed by the BLM.
   d) Channel crossings by pipelines will be constructed so that the pipe is buried at least four feet below the channel bottom.
2. Low water crossings will be constructed at original streambed elevation in a manner that will prevent any blockage or restriction of the existing channel. Material removed will be stockpiled for use in reclamation of the crossings.

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

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

2.3.2.3. Soils

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

2.3.2.4. Vegetation

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

2.3.2.5. Wetland/Riparian

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

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

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

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

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

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

2.3.2.6. Wildlife

1. For any surface-disturbing activities proposed in sagebrush shrublands, the Companies will conduct clearance surveys for sage grouse breeding activity during the sage grouse's breeding season before initiating the activities. The surveys must encompass all sagebrush shrublands within 0.5 mile of the proposed activities.

2. The Companies will locate facilities so that noise from the facilities at any nearby sage grouse or sharp-tailed grouse display grounds does not exceed 49 decibels (10 dBA above background noise) at the display ground.

3. The Companies will construct power lines to minimize the potential for raptor collisions with the lines. Potential modifications include burying the lines, avoiding areas of high avian use (for example, wetlands, prairie dog towns, and grouse leks), and increasing the visibility of the individual conductors.

4. 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. The Companies will locate impoundments to avoid sagebrush shrublands, where practical.

6. 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.

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

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

2.3.2.7. Threatened, Endangered, or Sensitive Species

2.3.2.7.1. Bald Eagle

1. Special habitats for raptors, including wintering bald eagles, will be identified and considered during the review of the Sundry Notices.

2. Weed treatment and limited reclamation activities (i.e. seeding) may occur within a 0.5 to 1.0 mile radius of active bald eagle nests between May 15 and June 15. Operators must contact the authorizing agency who will coordinate with and receive written confirmation from the Service before application of this measure.

2.3.2.7.2. Ute Ladies'-tresses Orchid

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

2.3.2.8. Visual Resources

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

2.3.2.9. 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.

2.3.2.10. Air Quality

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

2.3.3. Site specific mitigation measures

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

Well	Section	Aliquot	T	R	Site Specific COAs
21-04BG	4	NENW	44N	77W	first 150 yds of access to well: mowing will not exceed 20' in width to minimize disturbance to sagegrouse habitat
32-32BG	32	SWNE	45N	77W	mowing will be kept to 35' radius from well stake to minimize disturbance to sagegrouse habitat

Well	Section	Aliquot	T	R	Site Specific COAs
12-19BG	19	SWNW	45N	77W	2TK up to main rd, gravel from well pad up road ~200 feet to minimize soil erosion
21-19BG	19	NENW	45N	77W	spoils pile to be placed at NE corner of location, to keep spoils away from drainage
23-19BG	19	NESW	45N	77W	slot < 2' of cut, upper bench will be working area
14-31BG	31	SWSW	45N	77W	mowing will be kept to 35' radius from well stake to minimize disturbance to sagegrouse habitat
41-31BG	31	NENE	45N	77W	pit to be placed E of location
23-32BG	32	NESW	45N	77W	access: mowing will not exceed 20' in width , mowing will be kept to 35' radius from well stake to minimize sagegrouse habitat
31-24BG	24	NWNE	45N	78W	all work to be done in front of well stake to minimize well footprint
34-24BG	24	SWSE	45N	78W	reserve pit liner will be required due to sandy soils

1. 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 un-forested 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.

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 Jepson Draw II POD is Carlsbad Canyon 2.5Y 6/2.

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

10-14" Precipitation Zone Loamy Ecological Site Seed Mix

Species	% in Mix	Lbs PLS*
Western Wheatgrass (Pascopyrum smithii)	**40**	**4.8**
Bluebunch Wheatgrass (Pseudoroegneria spicata ssp. Spicata)	**10**	**1.2**
Green needlegrass (Nassella viridula)	**25**	**3.0**
Thickspike Wheatgrass (Elymus lanceolatus ssp. lanceolatus)	**10**	**1.2**
Prairie coneflower (Ratibida columnifera)	**5**	**0.6**
White or purple prairie clover (Dalea candidum, purpureum)	**5**	**0.6**
Rocky Mountain Beeplant (Cleome serrulata) /or *American vetch*(Vicia americana)	**5**	**0.6**
Totals	**100%**	**12 lbs/acre**

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

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

4. The approval of this project does not grant authority to use off lease federal lands. No surface disturbing activity, or use of off-lease federal lands, is allowed on affected leases until right-of-way grants become effective on the date in which the right-of-way grant is signed by the authorized officer of the BLM.

5. The culvert locations will be staked prior to construction. The culvert invert grade and finished road grade will be clearly indicated on the stakes. Culverts will be installed on natural ground, or on a designed flow line of a ditch. The minimum cover over culverts will be 12" or one-half the diameter whichever is greater. Drainage laterals in the form of culverts or waterbars shall be placed according to the following spacing:

Grade	Drainage Spacing
2-4%	310 ft
5-8%	260 ft
9-12%	200 ft
12-16%	150 ft

6. Provide 4" of aggregate where grades exceed 8%.

Water Management

Reservoir	Aliquot	Sec	Twp	Rng	Notes
Crash	NWNW	24	45N	78W	The water line to its outfall will be moved from where it was staked to the area of present disturbance
Alley	NWNE	24	45N	78W	It was suggested that this dam be moved downstream in order to incorporate the 3-4 foot headcut into the embankment
Main	SESW	24	45N	78W	Because of its size, it should be built in such a way as to incorporate the downstream 5 foot headcut into the embankment
Busy	NESE	24	45N	78W	Dam should incorporate headcut into embankment
First Dam	NENW	19	45N	77W	Because of a narrow right flank, it was suggested that the dam could be angled and/or moved upstream about 200 or more feet
Shadow Caster	SWNE	31	45N	77W	May have to be moved downstream a short distance so that expected high water line of reservoir does not inundated a power pole
Avenue	NESE	30	45N	77W	Should be built so headcut downstream of toe is incorporated into dam's embankment
Bourbon	SESE	31	45N	77W	Headcut downstream should be incorporated into embankment
Hammer	SESW	32	45N	77W	This dam's outfall should be moved closer to the reservoir's expected high water line to reduce erosion

Wildlife

1. The Record of Decision for the Powder River Basin EIS includes a programmatic mitigation measure that states, "The companies will conduct clearance surveys for threatened and endangered or other special-concern species at the optimum time" (M32). The measure requires companies to coordinate with the BLM before November 1 annually to review the potential for disturbance and to agree on inventory parameters. Should this project not be completed by November 1, Windsor Energy Group will coordinate with the BLM to determine if additional resurvey will be required.
2. The contract biologist shall contact the BLM prior to initiating any wildlife surveys.
3. In order to utilize existing overhead powerlines within the Jepson Draw 2 project area the following will be required by Windsor Energy Group:

   For modification of existing facilities any of the following may need to performed:

   A. Existing structures, such as dead ends, tap or junction poles, transformers, reclosers and capacitor banks or other structures with less than 60" between conductors or a conductor and ground will need to be retrofitted to provide adequate spacing for bald eagles (i.e. minimum 60" for bald eagles).
   B. Cover exposed jumpers
   C. Gap any pole top ground wires
   D. Isolate grounded guy wires (install insulating link)
   E. On transformers, install insulated bushing covers, covered jumpers, and cutout covers and arrestor covers, if necessary
   F. If bald eagle mortalities occur on existing lines and structures, bald eagle protection measures are to be applied (e.g. modify for raptor-safe construction, install safe perches or perching deterrents, nesting platforms or nest deterrent devices, etc.).
4. No surface disturbing activity shall occur within one mile of bald eagle habitat (Powder River) annually from November 1 through April 1 (CM9), prior to a winter roost survey or from February 1

through August 15 (CM8) prior to a nesting survey. This affects the following wells and infrastructure:

Township/Range	Section	Wells and Infrastructure
45/78	24	**Wells: Streeter Federal – BG 12, , 21, 23, 31, 34, 41, and 43 (24-45-78)** **Impoundments: Crash, Alley, Main, and Lane** **ALL** project related activities within this ENTIRE section, except the 43-24-45-78 well and its associated access/pipeline corridor to the southeast.
45/78	25	**Wells: None** **Impoundments: Lostra and Botieff** **ALL** project related activities in the **NW ¼** of this section.

a. If a roost is identified and construction has not been completed, a year round disturbance-free buffer zone of 0.5 mile will be established for all bald eagle winter roost sites (November 1 - April 1). Additional measures such as remote monitoring and restricting maintenance visitation to between 9:00 AM and 3:00 PM may be necessary to prevent disturbance.
b. If a nest is identified and construction has not been completed, a disturbance-free buffer zone of 0.5 mile (i.e., no surface occupancy) would be established year round for all bald eagle nests. A seasonal minimum disturbance-free buffer zone of 1-mile will be established for all bald eagle nest sites (February 1 - August 15).
c. Additional mitigation measures may be necessary if the site-specific project is determined by a Bureau biologist to have an adverse affect to bald eagles or their habitat.

5. The following conditions will minimize the impacts to raptors:
   a. No surface disturbing activity shall occur within ½ mile of all identified raptor nests from February 1 through July 31, annually, prior to a raptor nest occupancy survey for the current breeding season. This timing limitation will affect the following:

Township/Range	*Sec.*	*Affected Wells and Infrastructure*
45/77	19	**Wells: Streeter Federal – BG 23, 34, 41, and 43 (-19-45-77)** Impoundments: None **ALL** project related activities within the **S½** of this section, ***except*** the 14-19-45-77 well.
45/77	29	**Wells: Streeter Federal – BG 21 and 23 (-29-45-77)** Impoundments: None **ALL** project related activities within this section **east of** the 12-29-45-77 well and the proposed access to the 23-29-45-77 well.
45/77	30	**Wells: Streeter Federal – BG 21 and 41 (-30-45-77)** Impoundments: None **ALL** project related activities within the **NW ¼** of this section, ***except*** the road to the 41-25-45-78 well.
45/77	32	**Wells: Streeter Federal – BG 12, 21, 23, 34, and 43 and Federal – BG 32 and 41 (-32-45-77)** **Impoundments: Paved and Hammer** **ALL** project related activities within this **ENTIRE** section, ***except*** the 14-32-45-77 well and its proposed access/pipeline corridor.
44/77	7	**Wells: Streeter Federal - BG 41-07-44-77** Impoundments: None **ALL** project related activities within the **NE¼NE¼** of this section.
44/77	8	**Wells: Streeter Federal – BG 12, 21, 23, and 32 (-8-44-77)** **Impoundments: Smurphy Murphy, Chicken Foot, and 8 point**

Township/Range	*Sec.*	*Affected Wells and Infrastructure*
		ALL project related activities within this section **northeast of** the Streeter Reservoir ***except*** the 41-8-44-77 well.

b. Surveys to document nest occupancy shall be conducted by a biologist following BLM protocol, between April 15 and June 30. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities. Surveys outside this window may not depict nesting activity. If a survey identifies active raptor nests, a ½ mile timing buffer will be implemented. The timing buffer restricts surface disturbing activities within ½ mile of occupied raptor nests from February 1 to July 31.

c. Nest productivity checks shall be completed for the first five years following project completion. The productivity checks shall be conducted no earlier than June 1 or later than June 30 and any evidence of nesting success or production shall be recorded. Survey results will be submitted to a Buffalo BLM biologist in writing no later than July 31 of each survey year. This applies to the following nest(s):

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS IN 2006
4202	Red-tailed hawk	408120E 4856963N	NENW Sec. 20 T45N, R77W	Cottonwood, live	Good	Active
4203	Great-horned owl	406981E 4855940N	SWSE Sec. 19 T45N, R77W	Creek bank	Unknown	Active
4204	Red-tailed hawk	408726E 4855294N	SWNE Sec. 29 T45N, R77W	Cottonwood, live	Good	Active
4205	Red-tailed hawk	409157E 4853957N	NENE Sec. 32 T45N, R77W	Cottonwood, live	Fair	Inactive
4206	Red-tailed hawk	408510E 4853401N	SWNE Sec. 32 T45N, R77W	Cottonwood, live	Poor	Inactive
4207	Red-tailed hawk	408506E 4853397N	SWNE Sec. 32 T45N, R77W	Cottonwood, live	Good	Inactive
4208	Ferruginous hawk	411195E 4853055N	NESW Sec. 34 T45N, R77W	Creek bank	Good	Active
4209	Red-tailed hawk	408292E 4850479N	SENW Sec. 8 T45N, R77W	Cottonwood, live	Good	Active

d. The occupancy check for nest 4205 (NENE Section 32, T45N, R77W) will be conducted in May (due to late nesting species). If this nest is active, Windsor Energy Group will monitor the activity of the raptors at the nest for the remainder of the nesting period (until July 31 or the young have fledged) during operations and maintenance visits to the 41-32BG well location for the first five years following project completion. Monitoring will occur as follows:

A biologist is required to monitor the nest during well metering, maintenance and other site visits (excluding emergencies) and document the birds' behavior in response to human activity, equipment activity and noise throughout the entire buffer. The biologist must be in position to monitor the nest at least ½ hour before the monitoring or maintenance crews arrive and begin work and ½ hour after the monitoring or maintenance crews leave for the day. The biologist will record all of the bird's activity and document weather conditions and submit a report of the activity to the BLM biologist.

e. If an undocumented raptor nest is located during project construction or operation, the Buffalo Field Office (307-684-1100) shall be notified within 24 hours.

f. Well metering, maintenance and other site visits within 0.5 miles of raptor nests shall be minimized as much as possible during the breeding season (February 1 – July 31), and restricted to between 0900 and 1500 hours.

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

Township/Range	*Section*	*Affected Wells and Infrastructure*
45/77	19	**Wells: Streeter Federal – BG 34 and 43 (-19-45-77)** Impoundments: None **ALL** project related activities within the **SE ¼** of this section.
45/77	29	**Wells: Streeter Federal – BG 12, 14, 21, and 23 (-29-45-77)** Impoundments: None **ALL** project related activities within this **ENTIRE** section.
45/77	30	**Wells: Streeter Federal – BG 14, 21, 23, 32, 34, 41, and 43 (-30-45-77)** **Impoundments: Avenue and RGR** **ALL** project related activities within this **ENTIRE** section, ***except*** the 12-30-45-77 well and the access/pipeline corridor to the 41-25-45-78 well.
45/77	31	**Wells: Streeter Federal – BG 23, 32, 34, 41, and 43 (-31-45-77)** **Impoundments: Old Murphy, Shadow Caster, Bourbon, and Cupa Joe** **ALL** project related activities within this **ENTIRE** section ***except*** the SW¼SW¼ of the section
45/77	32	**Wells: Streeter Federal – BG 12, 14, 21, 23, 34 and 43 (-32-45-77) and Federal – BG 32 and 41 (-32-45-77)** **Impoundments: Wall, Paved, and Hammer** **ALL** project related activities within this **ENTIRE** section.
44/77	4	**Wells: Streeter Federal – BG 14 and 23 (4-44-77) and Federal – BG 12 and 21 (4-44-77)** **Impoundments: Whimper** **ALL** project related activities within this **ENTIRE** section.
44/77	5	**Wells: Streeter Federal – BG 12, 21, 23, 32, 41 and 43 (-5-44-77)** **Impoundments: Zipper** **ALL** project related activities within the **ENTIRE** section, ***except*** the 14-05-44-77 and 34-05-44-77 wells and their associated access/pipeline corridors to the south of these wells.
44/77	6	**Wells: Streeter Federal – BG 32 and 41 (-6-44-77)** **Impoundments: Teabag** **ALL** project related activities within the **NE ¼** of this section.

   b. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and surface disturbing activities will not be permitted until after the nesting season. If surveys indicate that the identified lek is inactive during the current breeding season, surface disturbing activities may be permitted within the 2 mile buffer until the following breeding season (March 1). The required sage-grouse survey will be conducted by

a biologist following the most current WGFD protocol. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities.

c. Creation of raptor hunting perches will be avoided within 0.5-mile of documented sage grouse lek sites. Perch inhibitors will be installed to deter avian predators from preying on sage grouse.
d. Well metering, maintenance and other site visits within 0.5 miles of documented sage grouse lek sites shall be minimized as much as possible during the breeding season (March 1– June 15), and restricted to between 0900 and 1500 hours.

Cultural Resources
Conditions of Approval:

1. 48 JO 1: Two sections of fencing will be installed to control vehicle access, and avoid stone circle features. All linear disturbance between access road and well pad will be required to use vehicle access corridor between fencing.

2. 48 JO 128: A utility corridor will be constructed on north side of access road per original POD design.

3. 48 JO 3635: Three recommendations have been made regarding this site:
   a. Re-route the vehicle way and utility corridor to the west by at least ten meters, or
   b. Monitor utility trench and road construction through the cultural site boundary,
   c. Within the site boundary the area of disturbance of the utility corridor a gravel treatment or other fill material will be required in the uitility corridor to reduce erosion.

3. DESCRIPTION OF AFFECTED ENVIRONMENT

Applications to drill were received on June 23, 2006. Field inspections of the proposed Jepson Draw II CBNG project were conducted November 27, 2006 and January 29 through February 2, 2007 by:
Windsor Energy: Alan Shultz, Tom Roberts
CBMA: Chris Ewert
Landowners: Edwin Streeter, Rob Streeter
BLM: Eric Holborn, Jenny Morton, BJ Earle, Ben Adams.

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			Jennifer Morton
Floodplains	X			Ben Adams
Wilderness Values		X		Eric Holborn
ACECs		X		Eric Holborn
Water Resources	X			Ben Adams
Air Quality		X		Eric Holborn
Cultural or Historical Values		X		BJ Earle
Prime or Unique Farmlands			X	Eric Holborn

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Wild & Scenic Rivers			X	Eric Holborn
Wetland/Riparian	X			Ben Adams
Native American Religious Concerns			X	BJ Earle
Hazardous Wastes or Solids			X	Eric Holborn
Invasive, Nonnative Species	X			Eric Holborn
Environmental Justice		X		Eric Holborn

3.1. Topographic Characteristics of Project Area

The project area is located approximately 10 miles northeast of Sussex, WY in southeastern Johnson County, Township 44 North, Range 77 West, Sections 4-8; Township 44 North, Range 78 West, Section 1; Township 45 North, Range 77 West, Sections 19, and 29-32; and Township 45 North, Range 78 West, Sections 24 and 25, Sixth Principal Meridian. The project area involves private and federal surface overlying federal minerals. Anadarko's Table Mountain Phase 1 POD is located approximately 1.5 miles east, Bill Barrett's Willow Creek POD is located approximately 1.5 miles northeast, and Windsor Energy Group's Jepson Draw 1 POD is located approximately 0.5 mile southeast of the project area. There is currently no CBNG development directly surrounding any of the project area.

Topography ranges from relatively flat along the Powder River and Little Willow Creek flood plains, to rough, broken terrain featuring several eroded draws and steep ridges primarily in the eastern and northern portions of the project area. Numerous drainages contain exposed soil and sandstone with prominent rock ledges and escarpments (Vetter 2006). Elevations within the project area range from approximately 4240 to 4851 feet. There has been extensive oil and gas extraction, in the area as well as cattle and sheep grazing. Recent CBM development consists of the Jepson Draw I project (approved 6/22/06) to the southeast of Jepson Draw II POD.

3.2. Vegetation & Soils

Using the Natural Resource Conservation Service, (NRCS, USDA), Technical Guides for the Major Land Resource Area 58B Northern Rolling High Plains, in the 10-14" Northern Plains precipitation zone, the landform and the soils for the proposed project consist of Shallow Loamy, Loamy and Sandy ecological sites.

The predominant ecological site observed within the proposed POD is classified as Shallow Loamy. This site was observed throughout the POD, on undulating slopes and ridge tops, but may occur on all slopes. This site occurs on nearly level to 50% slopes with the typical landforms as follows: Hill sides, ridges and escarpments. The soils of this site are shallow (less than 20"to bedrock) well-drained soils formed in alluvium over residuum. These soils have moderate permeability and may occur on all slopes. The bedrock, may be any kind except igneous, is virtually impenetrable to plant roots. The surface soil will have one or more of the following textures: very fine sandy loam, loam, silt loam, sandy clay loam, silty clay loam, and clay loam. Erosion potential varies from moderate to very high depending on vegetative cover and slope.

Throughout the project area sandy inclusions were observed within the shallow loamy ecological sites. Layers of the soil most influential to the plant community vary from 3 to 6 inches thick. The main soil limitations include: depth to bedrock, low organic matter content, soil droughtiness, low water holding capacity, and high wind erosion potential. Vegetation observed in the inclusions consisted of yucca, prairie sandreed, needleandthread, and Indian ricegrass. The low annual precipitation should be considered when planning a seeding.

Bottom land within the project area consisted of loamy soils. The soils of this site are deep to moderately deep (greater than 20" to bedrock), well drained & moderately permeable. This site occurs on gently undulating rolling land with the typical landforms as follows: Hill sides, alluvial fans, ridges & stream terraces. Layers of the soil most influential to the plant community varies from 3 to 6 inches thick. These layers consist of the A horizon with very fine sandy loam, loam, or silt loam texture and may also include the upper few inches of the B horizon with sandy clay loam, silty clay loam or clay loam texture. Erosion potential varies from low to moderate depending on vegetative cover and slope.

The plant community observed within the project area, excluding the sandy inclusions, is defined as Mixed Sagebrush/Grass with a species composition of; bluebunch wheatgrass, western wheatgrass, blue grama, green needlegrass, little bluestem, needleandthread, Wyoming big sagebrush. The state is stable and protected from excessive erosion. The biotic integrity of this plant community is intact. However, it can be at risk depending on how far a shift has occurred in plant composition toward blue grama, sagebrush, and/or cheatgrass. However, it can become at risk when canopy cover of sagebrush, blue grama sod, and/or bare ground increases.

Discontinuous stands of mature cottonwoods were observed in the northwest area of the project, along the Powder River.

3.2.1. Wetlands/Riparian

Mature cottonwoods are found as individual trees along the project area's ephemeral draws. No natural wetland or riparian areas exist within the project area. However, the Powder River has very well developed riparian/wetland areas and also has mature gallery forests of cottonwoods and thick stands of willows within its floodplain. The Powder River lies just outside of the POD boundary and the drainages within the POD flow less than one mile, in most cases, before joining the river.

3.2.2. Invasive Species

Johnson County Weed and Pest was consulted by the proponent (see Integrated Pest Management Plan) and five state-listed noxious weed were identified to be in the general project area. These species are; Canada thistle, diffuse knapweed, Russian knapweed, saltcedar and Scotch thistle. A search of Buffalo Field Office Geographic Information Systems data developed from Federal, State and County weed data identified Russian knapweed and scotch thistle to be in project area.

3.3. Wildlife

The project area is drained by the Little Willow Creek and Jepson Draw, ephemeral tributaries of the Powder River and by the Powder River itself. Moderate flow was present along the Powder River during surveys in spring 2005 and 2006. Most minor drainages were dry in 2004-2006, but flowing water (8 to 10 inches deep, >2 feet wide) was present in 2005 and 2006 along Little Willow Creek. Portions of that drainage are bordered by lush vegetation that includes sedges, rushes, and thistle. Small pools of standing water (<4 inches deep) occurred along portions of Jepson Draw in early spring 2006. Two relatively large CBM-filled reservoirs and on smaller CBM water-filled reservoir were present in the project area in spring 2006. All three reservoirs are surrounded by upland vegetation or bare ground and no wetland vegetation is present. The climate is semi-arid, averaging 14.6 inches of precipitation annually, about 75% of which occurs between April and September. The 30-year mean maximum and minimum temperatures for July and January were 88ºF and 7ºF, respectively (Vetter 2006).

Land cover within the POD is comprised of approximately 61% grasslands, 31% sagebrush grasslands, 5% bare soil and rock, 2% woodlands, and 1% water. Grasses are prevalent throughout the area and range from 3 to 24 inches in height. Grasslands associated with the active prairie dog colonies are generally shorter (3 to 6 inches), and grasses present in most drainages are taller (8 to 18 inches). Grassland cover is generally sparse throughout the project area and ranges from 20-50% bare ground in

most places (Vetter 2006). Common species throughout the project area include cheatgrass, needle-and-thread, junegrass, native wheatgrass, Indian ricegrass, blue grama, and Japanese brome.

The most abundant shrub in the area is Wyoming big sagebrush. Sagebrush averages 18 to 24 inches in height and occurs throughout the area in a patchy mosaic of sparse to dense stands. The greatest concentrations of sagebrush occur along drainages in the eastern portion of the project area. Stands of sagebrush are especially dense in Sections 20, 28, 29, 33, the eastern half of 32, and the central portion of 24. Silver sage and greasewood are present along the Little Willow Creek drainage in the south and eastern extent of the project area, and in portions of Jepson Draw in Sections 18 and 19. Rabbitbrush and Great Plains Yucca are also found among many of the upland areas (Vetter 2006).

Trees within the project area are primarily limited to the northwestern portion of the project area along the Powder River. A continuous stand (several hundred trees) of mature cottonwoods is present along the Powder River floodplain in NE Section 32, SW Section 33, NE Section 4 and NW Section 3. Other trees include small stands (1 to 7 trees) of mature cottonwoods in SWSW Section24, NWNW and NWSE Section 20, NESW and NWNE Section 29, SWNE Section 36, NE Secton32, SESE Section 33, and NENE Section 4. One large willow is present along the Little Willow Creek drainage in NWNW Section 6 (Vetter 2006).

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

A habitat assessment and wildlife inventory surveys were performed by Thunderbird – Jones & Stokes (TJS). TJS performed surveys for bald eagles, mountain plover, sharp-tailed grouse, greater sage-grouse, raptor nests and prairie dog colonies according to protocol in 2006. No formal surveys were conducted for Ute ladies'-tresses orchid, although a habitat suitability survey was conducted in June 2006.

A BLM Biologist conducted a field visit on November 27, 2006 and January 29 and 30, 2007. During this time, the biologist reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project adjustment recommendations where wildlife issues arose.

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

3.3.1. Big Game

Big game species expected to be within the Jepson Draw 2 project area include mule deer and pronghorn antelope. The project area is part of the Pumpkin Buttes mule deer herd unit. The 2004 estimated Pumpkin Buttes herd population was 14,800 with a population objective of 11,000 (WGFD 2004).

Pronghorn antelope belong to the Pumpkin Buttes herd unit. Pronghorn antelope populations in this herd unit have been increasing since 1998 with a 2004 population estimate of 27,109 animals, and a herd objective of 18,000 (WGFD 2004).

The WGFD has designated the entire project area as winter yearlong range for mule deer and yearlong range for pronghorn antelope. Populations of mule deer and pronghorn antelope within their respective hunt areas are above WGFD objectives.

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

3.3.2. Aquatics

The project area is drained by ephemeral tributaries of the Powder River. No natural springs were identified within the project area. However, a saline seep was located just downstream of the proposed Botieff damsite.

The Powder River , located within approximately one mile of the project area, is one of the last free-flowing prairie stream ecosystems left in the United States; with existing flows, turbidity, and water quality within historic ranges. Due to this, the Powder River still supports an intact native fish community including several rare or declining species. These species have evolved life history strategies that allow them to survive in extreme conditions (Hubert, 1993). Native fish species include sauger, shovelnose sturgeon, goldeye, plains minnow, sand shiner, flathead chub, plains killifish, river carpsucker, sturgeon chub, western silvery minnow, channel catfish, fathead minnow, longnose dace, mountain sucker, shorthead redhorse, longnose sucker, stonecat, white sucker and others. Six of these are designated by the Wyoming Game and Fish Department as either Native Species Status (NSS) 1, 2, or 3 species. Species in these designations are considered to be species of concern, in need of more immediate management attention, and more likely to be petitioned for listing under the Endangered Species Act.

NSS1 species (sturgeon chub and western silvery minnow) are those that are physically isolated and/or exist at extremely low densities throughout their range, and habitat conditions are declining or vulnerable. NSS2 species (goldeye, shovelnose sturgeon, and sauger) are physically isolated and/or exist at extremely low densities throughout their range, and habitat conditions appear to be stable. NSS3 species (Plains minnow) are widely distributed throughout their native range and appear stable; however, habitats are declining or vulnerable. For these species, the Wyoming Game and Fish Department has been directed by the Wyoming Game and Fish Commission to recommend that no loss of habitat function occur. Some modification of the habitat may occur, provided that habitat function is maintained (i.e., the location, essential features, and species supported are unchanged).

The sturgeon chub was petitioned for listing under the Endangered Species Act in 2000. The sturgeon chub is a small minnow native to WY and within Wyoming is known to occur only in the Powder River and in one location on Crazy Woman Creek. The sturgeon chub requires large, free-flowing rivers characterized by swift flows, high variable flow regimes, braided channels, high turbidity and sand/gravel substrates. On April 18, 2001, the U.S. Fish and Wildlife Service determined that the listing was not warranted, due to the sturgeon chub population being more abundant and better distributed throughout their range than previously believed.

Amphibian and reptile species occur throughout the Basin, but there is little recorded baseline information available for them. Fish that have been identified in the Powder River watershed are listed in the PRB FEIS (3-156-159).

3.3.3. Migratory Birds

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

3.3.4. Raptors

Eight raptor nest sites were identified by TJS within 0.5 mile of the project area, five of which were active in 2006 (Table 4.).

Table 4. Documented raptor nests within the Jepson Draw 2 project area in 2006.

BLM ID#	SPECIES	UTM	LEGAL LOCATION	SUBSTRATE	CONDITION	STATUS IN 2006
4202	Red-tailed hawk	408120E 4856963N	NENW Sec. 20 T45N, R77W	Cottonwood, live	Good	Active
4203	Great-horned owl	406981E 4855940N	SWSE Sec. 19 T45N, R77W	Creek bank	Unknown	Active
4204	Red-tailed hawk	408726E 4855294N	SWNE Sec. 29 T45N, R77W	Cottonwood, live	Good	Active
4205	Red-tailed hawk	409157E 4853957N	NENE Sec. 32 T45N, R77W	Cottonwood, live	Fair	Inactive
4206	Red-tailed hawk	408510E 4853401N	SWNE Sec. 32 T45N, R77W	Cottonwood, live	Poor	Inactive
4207	Red-tailed hawk	408506E 4853397N	SWNE Sec. 32 T45N, R77W	Cottonwood, live	Good	Inactive
4208	Ferruginous hawk	411195E 4853055N	NESW Sec. 34 T45N, R77W	Creek bank	Good	Active
4209	Red-tailed hawk	408292E 4850479N	SENW Sec. 8 T45N, R77W	Cottonwood, live	Good	Active

3.3.5. Threatened and Endangered and Sensitive Species

3.3.5.1. Threatened and Endangered Species

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

3.3.5.1.1. Black-footed ferret

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

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

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

Two black-tailed prairie dog colonies were identified during site visits by TJS partially or wholly within the project area. One colony, located in SW Section 5 and NESE Section 6, T44N, R77W, is approximately 122.8. A second colony is located within NESW Section 6, T44N, R77W and is approximately 14 acres in size. These two colonies are well over 1.5 km from the nearest colonies outside of the project area. The Jepson Draw project area is located directly northeast of the Midwest

black-footed ferret potential reintroduction area. Black-footed ferret habitat is not present within the Jepson Draw 2 project area.

3.3.5.1.2. Bald eagle

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

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

The Jepson Draw 2 project has mature trees associated with it. Extensive bald eagle use has been recorded surrounding the project area to the west (Powder River), north and east (Willow Creek) (Table 2.1).

Table 2.1. Bald eagle observations and nests within the action area (15 mile radius) of the Jepson Draw 2 project area.

INDIVIDUALS	UTMS	LEGAL LOCATION	DATE
Within 0.5 mile to 1.0 mile of the project area			
2 adults	403296E, 4855961N	SESW Sec. 23, T45N, R78W	01/12/2004
1adult	402862E, 4855512N	NWNW Sec. 26, T45N, R78W	01/21/2005
2 adults	403062E, 4855343N	NWNW Sec. 26, T45N, R78W	02/10/2005
1 adult	403600E, 4858200N	NESW Sec. 14, T45N, R78W	12/01/2006
Within 0.5 mile to 1.0 mile of the project area (continued)			
2 adults	403400E, 4856400N	NESW Sec. 23, T45N, R78W	12/01/2006
Within 2.0 miles to 3.0 miles of the project area			
3 adults			2005
3 adults			2006
2 adults			2007
Within 3.0 miles to 4.0 miles of the project area			
1 immature			2007
Within 4.0 miles to 5.0 miles of the project area			
2 adults			2006
Within 5.0 miles to 10.0 miles of the project area			
3 adults / 4 immatures			1985
1 adult /1 immature			2004
2 adults / 2 immatures			2005
29 adults / 1 immature			2006
13 adults / 1 immature			2007

INDIVIDUALS	UTMS	LEGAL LOCATION	DATE
Within 10.0 miles to 15.0 miles of the project area			
4 adults / 5 immatures			1985
1 adult / 1 immature			2004
10 adults / 1 immature			2005
16 adults			2006
21 adults / 5 immatures			2007

3.3.5.1.3. Ute's Ladies Tresses Orchid

This orchid is listed as Threatened under the Endangered Species Act. It is extremely rare and occurs in moist, sub-irrigated or seasonally flooded soils at elevations between 1,780 and 6,800 feet above sea level. Habitat includes wet meadows, abandoned stream channels, valley bottoms, gravel bars, and near lakes or perennial streams that become inundated during large precipitation events. Prior to 2005, only four orchid populations had been documented within Wyoming. Five additional sites were located in 2005 (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.

No springs are present. There are reservoirs located within the project area which are used to contain CBNG produced water. These reservoirs have abrupt margins along the water/vegetation boundary. The vegetation community directly adjacent to the water is sagebrush. There is also a spreader dam located within the project area. This spreader dam creates a reservoir of water that has created an area of potential habitat along the margin of the reservoir. This area of potential habitat is very limited due to the abruptness of the boundary. The remainder of the project area is generally dominated by dry ephemeral drainages that do not have a late season water source (BKS Associates 2006). Suitable orchid habitat is not present within the Jepson Draw 2 project area.

3.3.5.2. Sensitive Species

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

3.3.5.2.1. Black-tailed prairie dog

On August 12, 2004, the U.S. Fish and Wildlife Service removed the black-tailed prairie dog's Candidate status. The Buffalo Field Office however will consider prairie dogs as a sensitive species and continue to afford this species the protections described in the FEIS. The black-tailed prairie dog is a diurnal rodent inhabiting prairie and desert grasslands of the Great Plains. Their decline is related to multiple factors including, habitat destruction, poisoning, and Sylvatic plague. Two black-tailed prairie dog colonies are located within the project area. The colony located in SW Section 5 and NESE Section 6, T44N, R77W is approximately 122.8. A second colony is located within NESW Section 6, T44N, R77W and is approximately 14 acres in size.

3.3.5.2.2. Greater sage-grouse

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

Suitable sage-grouse habitat is present through out the project area. Four documented sage-grouse leks are present within two miles of the project area (Table 6). Sage-grouse were observed at three of these leks in 2006.

Table 6. Documented sage-grouse leks within two miles of the Jepson Draw 2 project in 2006.

Lek ID	UTM NAD83	Legal Location	Status (Peak Males) in 2006	Distance From Project Area (Miles)
Irigary	409300E 4854500N	SWSW Sec. 28 T45N, R77W	1	0.25
Irigary II	410383E 4854210N	SWSE Sec. 28 T45N, R77W	10	0.87
Christiansen Ranch 7	412682E 4850520N	SWNW Sec. 11 T44N, R77W	0 (2 in 2005)	1.42
Mengel	402862E 4855512N	SWNE Sec. 19 T44N, R77W	29	1.82

3.3.5.2.3. Mountain plover

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

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

3.4. West Nile Virus

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

Since its discovery in 1999 in New York, WNv has 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

Year	Total WY Human Cases	Human Cases PRB	Veterinary Cases PRB	Bird Cases PRB
2003	392	85	46	25
2004	10	3	3	5
2005	12	4	6	3
2006	65	0	2	2

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

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

Mosquitoes can potentially breed in any standing water that lasts more than 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 primarily along Little Willow Creek and Jepson Draw and several unnamed direct tributaries to the Powder River.

3.5.1. Groundwater

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

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

Specifically relative to groundwater, the plan identified the following (PRB FEIS 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 CBM impoundments, and;
- Shallow groundwater wells would be installed and monitored where necessary.

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 has 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 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 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 Wyoming Department of Environmental Quality (WDEQ) is now requiring monitoring of shallow groundwater below unlined CBNG impoundments where Class III or better water is encountered. Results of this monitoring have yet to be analyzed.

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.

A search of the Wyoming State Engineer Office (WSEO) Ground Water Rights Database for this area showed 5 registered stock and domestic water wells within the POD boundary with depths ranging from 320 feet to 600 feet below ground surface. For additional information on water, please refer to the PRB FEIS (January 2003), Chapter 3, Affected Environment pages 3-1 through 3-36 (groundwater) and 3-36 through 3-56 (surface water).

3.5.2. Surface Water

The project area drains primarily into the Little Willow Creek drainage. The northern portion drains into several direct tributary draws to the Powder River and also Jepson Draw, which is a tributary to the mainstem as well. Under natural conditions, all drainages in the project area are ephemeral, flowing only in response to precipitation events and snowmelt. The upper reaches near the hydrologic divides are gently sloping ridges, grading rapidly to gully systems, some with steep side slopes and fairly flat, broad bottoms. Typically, the broad-bottomed swales are well vegetated with brush and grass. 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 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 great. These types of events can form gullies where none existed, remove dams, and wash out roads and culverts.

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, WY. At the gaging station on Salt Creek near Sussex, WY (which is a short distance upstream of Little Willow Creek) the EC ranges from 5204 µmhos/cm at Maximum monthly flow to 5668 µmhos/cm at low monthly flow and the SAR ranges from 18.9 at maximum monthly flow to 25.1 at low monthly flow. (PRB FEIS, page 3-49).

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

The operator has stated that there were "…no natural springs identified within the project area or the ½-mile radius of the project area". However, a saline "seep" was found in the gully immediately downstream of the proposed site for Botieff Dam.

3.6. Cultural Resources

Class III cultural resource inventories were conducted for the Jepson Draw II project prior to implementation of the Coal Bed Methane Plan of Development.:
(BFO Inventory No. 70060241, Quality Services for Windsor Energy: Jepson Draw II). A total of 6,893 acres were inventoried to Class III level; 71 sites and 31 Isolated Resource Finds were inventoried within or near the Area of Potential Effect. The report was reviewed by BJ Earle, field checked, and found adequate.

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

Table 3.5 Cultural Resources Inventory Results

Site Number	Site Type	Eligibility	Site Number	Site Type	Eligibility
48 JO 1	Prehistoric Stone Circles	Eligible	48 JO 90	Prehistoric Lithic	Not eligible
48 JO 128	Prehistoric Stone circles	Eligible	48 JO 1711	Lithic	Not eligible
48 JO 2901	Lithic	Not eligible	48 JO 2902	Multicomponent	Not eligible
48 JO 2903	Historic debris	Not eligible	48 JO 2904	Lithic	Not eligible
48 JO 2905	Lithic	Not eligible	48 JO 2906	Historic debris	Not eligible
48 JO 2907	Historic depression, debris	Not eligible	48 JO 2923	Lithic	Not eligible
48 JO 2924	Lithic	Not eligible	48 JO 2925	Lithic	Not eligible
48 JO 2926	Lithic	Not eligible	48 JO 2927	Lithic	Not eligible
48 JO 2928	Historic homestead	Not eligible	48 JO 2929	Lithic	Not eligible
48 JO 2930	Multicomponent	Not eligible	48 JO 2931	Multicomponent	Not eligible
48 JO 2932	Multicomponent	Not eligible	48 JO 2935	Multicomponent	Not eligible
48 JO 2936	Prehistoric occupation	Eligible	48 JO 2937	Historic debris	Not eligible
48 JO 2938	Prehistoric campsite	Not eligible	48 JO 2939	Lithic	Not eligible
48 JO 2940	Lithic	Not eligible	48 JO 2941	Lithic	Not eligible
48 JO 2942	Lithic	Not eligible	48 JO 2989	Multicomponent	Not eligible
48 JO 2990	Lithic	Not eligible	48 JO 2991	Lithic	Not eligible
48 JO 2992	Lithic	Not eligible	48 JO 2993	Lithic	Not eligible
48 JO 2994	Lithic and bone	Eligible	48 JO 2995	Lithic	Not eligible
48 JO 2996	Lithic	Not eligible	48 JO 2997	Lithic	Not eligible
48 JO 3000	Historic debris	Not eligible	48 JO 3001	Historic debris	Not eligible
48 JO 3002	Historic debris	Not eligible	48 JO 3003	Historic debris	Not eligible
48 JO 3004	Historic debris	Not eligible	48 JO 3005	Multicomponent	Not eligible
48 JO 3006	Multicomponent	Not eligible	48 JO 3381	Lithic	Not eligible

Site Number	Site Type	Eligibility
48 JO 3635	Campsite	Eligible
48 JO 3637	Multicomponent	Not eligible
48 JO 3639	Lithic	Not eligible
48 JO 3641	Lithic	Not eligible
48 JO 3642	Lithic	Not eligible
48 JO 3644	Historic debris	Not eligible
48 JO 3646	Historic debris	Not eligible
48 JO 3648	Historic debris	Not eligible
48 JO 3650	Lithic	Not eligible
48 JO 3652	Lithic	Not eligible
48 JO 3654	Lithic	Not eligible
48 JO 3656	Historic homestead	Not eligible
48 JO 3705	Historic homestead	Not eligible
48 JO 3657	Historic debris	Not eligible

Site Number	Site Type	Eligibility
48 JO 3636	Lithic	Not eligible
48 JO 3638	Multicomponent	Eligible
48 JO 3640	Lithic	Not eligible
48 JO 3641	Lithic	Not eligible
48 JO 3643	Multicomponent	Not eligible
48 JO 3645	Lithic	Not eligible
48 JO 3647	Campsite	Eligible
48 JO 3649	Historic debris	Not eligible
48 JO 3651	Lithic	Not eligible
48 JO 3653	Lithic	Not eligible
48 JO 3655	Lithic	Not eligible
48 JO 3657	Historic debris	Not eligible
48 JO 3706	Lithic	Not eligible
48 JO 3705	Historic homestead	Not eligible

4. ENVIRONMENTAL CONSEQUENCES

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

4.1. Vegetation & Soils Direct and Indirect Effects

Impacts to vegetation and soils from surface disturbance will be reduced, by following the operator's plans and BLM applied mitigation. Of the 82 proposed well locations, 5 are on existing or reclaimed conventional well pads, 77 can be drilled without a well pad being constructed. Surface disturbance associated with the drilling of the (77) wells would involve digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction (estimated approximate size of 20 x 15 feet), and compaction (from vehicles driving/parking at the drill site). Estimated disturbance associated with these 77 wells would involve approximately 0.1 acre/well for 7.7 total acres. The total estimated disturbance for all 82 wells would be 7.7 acres. This would be a short-term impact with expedient, successful reclamation and site-stabilization, as committed to by the operator in their POD MSUP and as required by BLM in COAs.

Approximately 2.0 miles of improved roads would be constructed to provide access to various well locations. Approximately 9.4 miles of new and existing two-track trails would be utilized to access well sites. The majority of proposed pipelines (gas and water) have been located in "disturbance corridors." Disturbance corridors involve the combining of 2 or more utility lines (water, gas, power) in a common trench, usually along access routes. This practice results in less surface disturbance and overall environmental impacts. Approximately 3.0 miles of pipeline would be constructed outside of corridors.

Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, gabions etc.) would ensure land productivity/stability is regained and maximized.

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

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

Table 4.1 summarizes the proposed surface disturbance.

Table 4.1 - SUMMARY OF DISTURBANCE

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Nonconstructed Pad	77	0.1/acre	7.7	Long Term
Monitor Wells		0.1/acre		Long Term
Impoundments				Long Term
On-channel	24	Site Specific	150	
Off-channel	1	Site Specific	4	
Water Discharge Points	25	Site Specific or 0.01 ac/WDP	0.5	
Channel Disturbance				
Headcut Mitigation*	0	Site Specific	0.0	
Channel Modification				
Pipeline Crossing*	0	Site Spec or 0.01 acres		
Road Crossing*	0	Site Spec or 0.01 acres	0.0	
			0.0	
Proposed Improved Roads With Corridor				
Existing Improved Roads With Proposed Corridor	2.0	40' Width	9.6	Long Term
	15.6	40' Width	75.8	Long Term

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Proposed 2-Track Roads With Corridor	9.4	25' Width	28.6	Long Term
Existing 2-Track Roads With Proposed Corridor	9.3	25' Width	28.2	Long Term
Buried Power Cable No Corridor	.50	25' Width or Site Specific	1.4	Short Term
Overhead Powerlines	2.5	30' Width	9.1	Long Term
Pump Stations/Water Stations	3	50'x50'	.06	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

Riparian and wetland areas are not well developed within this POD's boundaries. However, they are present on the Powder River which flows along the west boundary of the project area. The FEIS states that "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 amount of water which is likely to be produced by development of this project will add enough water to the tributaries of Little Willow Creek, Jepson Draw and the other tributaries to the Powder River to complete their perenialization (conversion from dry ephemeral channels to perennial streams with water flowing all year, along with attendant changes in vegetation). Upland grasses and forbs within the ephemeral channel bottoms would be replaced with sedges, rushes, and other moisture tolerant species along the channel edges. Contribution of flow directly to the Powder River will occur.

4.1.2. Invasive Species

Utilization of existing facilities and surface disturbance associated with construction of proposed access roads, pipelines, water management infrastructure, produced water discharge points and related facilities would present opportunities for weed invasion and spread. Produced CBNG water would likely continue to modify existing soil moisture and soil chemistry regimes in the areas of water release and storage. The activities related to the performance of the proposed project would create a favorable environment for the establishment and spread of noxious weeds/invasive plants such as salt cedar, Canada thistle and perennial pepperweed. However, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

An Integrated Pest Management Plan (IPMP) was provided by Windsor Energy Group. In order to minimize possible weed infestation, Windsor Energy will contract a licensed commercial applicator of chemical herbicides and pesticides to address infestation areas if they become established/identified. See the subject POD for detailed mitigation measures that the operator has committed to.

4.1.3. Cumulative Effects

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

As referenced above, the PRB FEIS did disclose that cumulative impacts may occur to soils and vegetation as a result of discharged produced CBNG water. The cumulative effects on vegetation and soils are anticipated to be within the parameters of 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 approximately 17% 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 Little Willow Creek and the Dry Fork of the Powder River and to construct additional downstream reservoirs, if necessary, or reduce water production, to prevent significant volumes of water from flowing into Powder River.
- The WMP for the Jepson Draw POD proposes that produced water will not contribute to significant flows downstream.

4.2. Wildlife

4.2.1. Big Game Direct and Indirect Effects

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

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

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

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

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

4.2.1.1. Cumulative effects

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

4.2.2. Aquatics Direct and Indirect Effects

Produced water is to be contained by impoundments in Jepson 1 and Jepson 2 PODs. The operator's WYPDES permit, issued by the State of Wyoming, specifies that all water produced as a result of CBNG development will be contained except in cases of large storm events.

Many of the reservoirs to which Jepson 2 water may be discharged are located a short distance from the Powder River. If a reservoir were to discharge, produced water would reach the river. Downstream species could be affected. Flow from the project, which has been requested to be permitted, could impact both water quantity and quality in the Powder River (see section 3.2.1).

Altering water temperatures, flow timing and magnitude, turbidity and chemical composition of the Powder River could harm native fish species which inhabit the Powder River. Changes 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.

Wyoming Game and Fish Department 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 Interagency Work 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 reported high salinities and electrical conductivities, possibly due to CBNG water, for the Spotted Horse drainage in their recently released report on the Powder River. This report indicated that CBNG discharges could affect native species in the drainage.

Change in Water Quantity
Native fauna in the Powder River drainage have evolved and adapted to a very dynamic hydrograph 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 will 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. This is a monitoring and adaptive management issue for CBNG development.

Due to limited information, it is difficult to assess what effects this discharge may have upon the aquatic flora and fauna 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 or winter months when the mean monthly river flow is smaller than during the remainder of the year. An addition of 1-5 cfs of project water to an average flow of 30 cfs into the Powder River is unlikely to affect its hydraulic regime or alter surface water quality. However, when river flow drops below 20 cfs, the impacts could be greater. 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.

4.2.2.1. Cumulative effects
WDEQ is aware of the concerns about the effects of water quality and flows relative to discharge of treated and untreated water directly into the Powder River. They are taking a conservative approach to permitting until more information can be obtained and their watershed based permitting approach is implemented. Long term water quality and flow monitoring that would be required in the WYPDES permit would help to 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).

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

Overhead power lines may affect migratory birds in several ways. Power poles provide raptors with perch sites and may increase predation on migratory birds. Power lines placed in flight corridors may result in collision mortalities. Some species may avoid suitable habitat near power lines in an effort to avoid predation. Additional direct and indirect effects to migratory birds are discussed in the PRB FEIS (4-231-235).

4.2.3.1. Cumulative effects
The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced

PRB FEIS, Volume 2, Chapter 4, Page 4-235.

4.2.4. Raptors Direct and Indirect Effects

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

Table 5. Infrastructure within close proximity to documented raptor nests within the Jepson Draw 2 project area (Timing limitations will apply to this infrastructure).

BLM ID#	UTM (NAD 83)	SPECIES	STATUS	WELL / PIT NUMBER	DISTANCE (MILES)
4202	408120E 4856963N	Red-tailed hawk	Active	Well: Streeter Federal – BG 41-19-45-77	0.42
4203	406981E 4855940N	Great-horned owl	Active	Well: Streeter Federal – BG 34-19-45-77	0.30
4203	406981E 4855940N	Great-horned owl	Active	Well: Streeter Federal – BG 23-19-45-77	0.33
4203	406981E 4855940N	Great-horned owl	Active	Well: Streeter Federal – BG 43-19-45-77	0.36
4203	406981E 4855940N	Great-horned owl	Active	Well: Streeter Federal – BG 21-30-45-77	0.33
4203	406981E 4855940N	Great-horned owl	Active	Well: Streeter Federal – BG 41-30-45-77	0.39
4204	408726E 4855294N	Red-tailed hawk	Active	Well: Streeter Federal – BG 21-29-45-77	0.36
4204	408726E 4855294N	Red-tailed hawk	Active	Well: Streeter Federal – BG 23-29-45-77	0.47
4205	409157E 4853957N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 41-32-45-77	0.15 – out of line-of-sight and mitigation applied
4205	409157E 4853957N	Red-tailed hawk	Inactive	Well: Federal – BG 32-32-45-77	0.39
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 23-32-45-77	0.27
4206	408510E 4853401N	Red-tailed hawk	Inactive	Pit: Paved	0.24
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Federal – BG 32-32-45-77	0.30
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 43-32-45-77	0.32
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 34-32-45-77	0.40
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 21-32-45-77	0.43
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 41-32-45-77	0.45
4206	408510E 4853401N	Red-tailed hawk	Inactive	Pit: Hammer	0.46

BLM ID#	UTM (NAD 83)	SPECIES	STATUS	WELL / PIT NUMBER	DISTANCE (MILES)
4206	408510E 4853401N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 12-32-45-77	0.48
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 23-32-45-77	0.27
4207	408506E 4853397N	Red-tailed hawk	Inactive	Pit: Paved	0.24
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Federal – BG 32-32-45-77	0.30
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 43-32-45-77	0.32
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 34-32-45-77	0.40
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 21-32-45-77	0.43
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 41-32-45-77	0.45
4207	408506E 4853397N	Red-tailed hawk	Inactive	Pit: Hammer	0.46
4207	408506E 4853397N	Red-tailed hawk	Inactive	Well: Streeter Federal – BG 12-32-45-77	0.48
4209	408292E 4850479N	Red-tailed hawk	Active	Pit: Smurphy Murphy	0.12
4209	408292E 4850479N	Red-tailed hawk	Active	Well: Streeter Federal – BG 12-08-44-77	0.22
4209	408292E 4850479N	Red-tailed hawk	Active	Well: Streeter Federal – BG 23-08-44-77	0.23
4209	408292E 4850479N	Red-tailed hawk	Active	Well: Streeter Federal – BG 32-08-44-77	0.25
4209	408292E 4850479N	Red-tailed hawk	Active	Well: Streeter Federal – BG 21-08-44-77	0.30
4209	408292E 4850479N	Red-tailed hawk	Active	Pit: Chicken Foot	0.33
4209	408292E 4850479N	Red-tailed hawk	Active	Well: Streeter Federal – BG 41-07-44-77	0.48
4209	408292E 4850479N	Red-tailed hawk	Active	Pit: 8 Point	0.48

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

The Streeter Federal-BG 34-19-45-77 well, originally located approximately 300' from a Great-horned owl nest, was moved approximately 0.3 miles east to a dry hole marker location. The Streeter Federal – BG 41-32-45-77 well, originally located approximately 446' from a red-tailed hawk nest, was moved approximately 124' west to remove it from line of sight of the nest. This well remains within 600' of the red-tailed hawk nest and may still disturb nesting activities, thereby reducing productivity and possibly result in nest abandonment. In order to evaluate this well's effect on nesting activity, Windsor Energy will be required to monitor the activity of nesting raptors in association with well maintenance and operation visits.

4.2.4.1. Cumulative effects

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

4.2.5. Threatened and Endangered and Sensitive Species

Within the BLM Buffalo Field Office there are three species that are Threatened or Endangered under the Endangered Species Act. Potential project effects on Threatened and Endangered Species were analyzed in a Biological Assessment and a summary is provided in Table 4.3. Threatened and Endangered Species potentially affected by the proposed project area are further discussed following the table.

4.2.5.1. Threatened and Endangered and Sensitive Species

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

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Endangered				
Black-footed ferret (*Mustela nigripes*)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	Suitable habitat of insufficient size.
Threatened				
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body.	S	LAA	Project includes overhead power and roads.
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Riparian areas with permanent water	NP	NE	No suitable habitat present.

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

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

4.2.5.1.1. Black-footed ferret

Because the black-tailed prairie dog colony within the Jepson Draw 2 project area is of insufficient size for supporting ferrets and is isolated from any prairie dog complexes, implementation of the proposed development should have no effect on the black-footed ferret.

4.2.5.1.2. Bald eagle

Occupied bald eagle nesting and roosting habitat occurs along and within the eastern border of the project area. Steps have been taken to minimize affects if eagles do use the area such as road design for minimal speeds and timing restrictions placed on operations during timeframes and within areas critical to bald eagle roosting and nesting. The proposed project will still likely affect bald eagle nesting or winter roosting.

There are 16.7 miles of existing overhead three-phase distribution lines within the project area. The wire spacing is not in compliance with the Avian Power Line Interaction Committee's (1996) suggested practices and with the Service's standards (USFWS 2002). Windsor will be required to upgrade any existing overhead powerlines prior to use by the federal project. Windsor is proposing an additional 2.5 miles of overhead three-phase distribution lines. There are currently 18.1 miles of two-track roads and 15.9 miles of improved roads within the project area, with 9.4 miles and 2.0 miles proposed respectively.

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

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

Produced water will be stored in 23 proposed and three existing reservoirs which may attract eagles if reliable prey is present, most likely in the form of waterfowl. The effect of the reservoirs on eagles is unknown. The reservoirs could prove to be a benefit (e.g. increased food supply) or an adverse effect (e.g. contaminants, proximity of power lines and/or roads to water). Eagle use of reservoirs should be reported to determine the need for any future management.

4.2.5.1.3. Ute's Ladies Tresses Orchid

Produced water will be contained in 25 on-channel reservoirs and one off-channel impoundment. In addition, some water may be transferred to existing or proposed reservoirs approved in the Jepson Draw 1 POD. Reservoir seepage may create suitable habitat if historically ephemeral drainages become perennial, however no historic seed source is present within or upstream of the project area.

Implementation of the proposed coal bed natural gas project should not affect the Ute ladies'- tresses orchid as suitable habitat is not present.

4.2.5.2. Sensitive Species Direct and Indirect Effects

Table 4.4 Summary of Sensitive Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
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.
Brewer's sparrow (*Spizella breweri*)	Basin-prairie shrub	K	MIIH	Sagebrush cover will be affected.
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	S	MIIH	Prairie dog colonies present.
Ferruginous hawk (*Buteo regalis*)	Basin-prairie shrub, grasslands, rock outcrops	S	MIIH	Grassland and shrubland habitats 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	S	MIIH	Grasslands will be affected.
Mountain plover (*Charadrius montanus*)	Short-grass prairie with slopes < 5%	S	MIIH	Prairie will be affected.
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	S	MIIH	Sagebrush cover will be affected.
Trumpeter swan (*Cygnus buccinator*)	Lakes, ponds, rivers	S	MIIH	New reservoirs may increase usage during migration.
White-faced ibis (*Plegadis chihi*)	Marshes, wet meadows	NP	NI	Permanently wet meadows not present.
Yellow-billed cuckoo (*Coccyzus americanus*)	Open woodlands, streamside willow and alder groves	NP	NI	Streamside habitats not present
Fish				
Yellowstone cutthroat trout (*Oncoryhynchus clarki bouvieri*)	Mountain streams and rivers in Tongue River drainage	NP	NI	Outside species range.
Mammals				
Black-tailed prairie dog (*Cynomys ludovicianus*)	Prairie habitats with deep, firm soils and slopes less than 10 degrees.	K	NI	No project activities planned within prairie dog towns.
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	S	MIIH	Grassland habitat will be affected.
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

4.2.5.2.1. Black-tailed prairie dog

No project related activities are proposed within any black-tailed prairie dog colonies.

4.2.5.2.2. Greater sage-grouse

Four documented sage-grouse leks are present within two miles of the project area (Table 6).

Greater sage-grouse habitat is being directly lost with the addition of well sites, roads, pipelines, power lines, reservoirs and other infrastructure (Theiele 2005, Oedekoven 2004). Sage-grouse avoidance of CBNG infrastructure results in even greater indirect habitat loss. The Wyoming Game and Fish Department (WGFD) feels a well density of eight wells per section creates a high level of impact for sage grouse and that sage-grouse avoidance zones around mineral facilities overlap creating contiguous avoidance areas (WGFD 2004).

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

Noise can affect sage grouse by preventing vocalizations that influence reproduction and other behaviors (WGFD 2003). Sage grouse attendance on leks within one mile of compressors is lower than for sites farther from compressors locations (Braun et al. 2002).

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

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

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

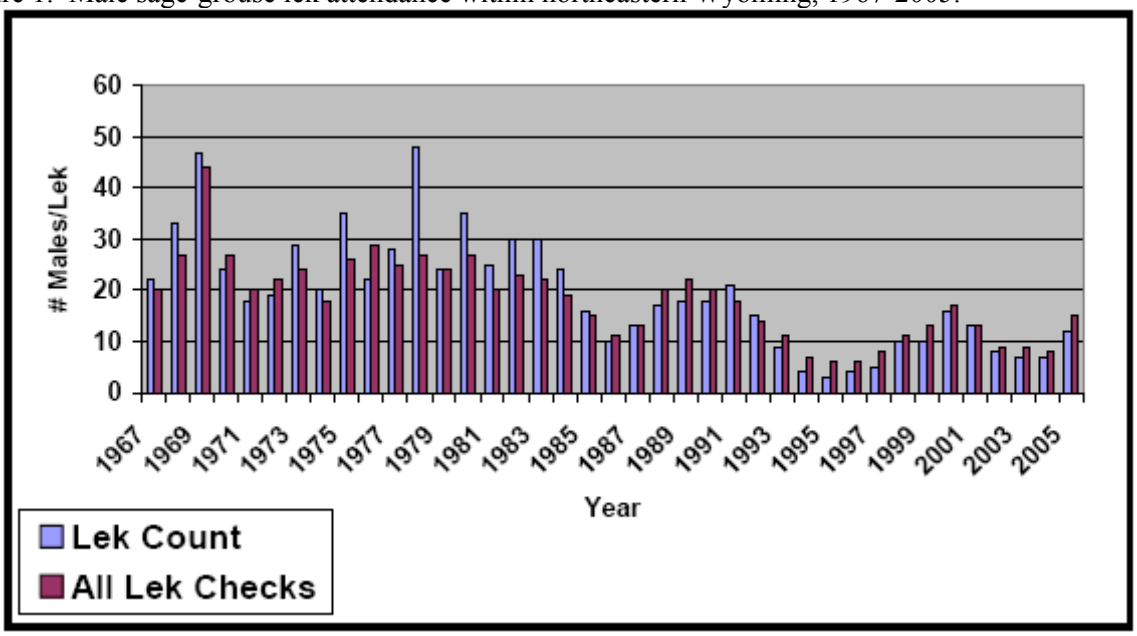
Additional studies, across more of the sage-grouse's range, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported only 45% of their sage grouse hens nested within 3 km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

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

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

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

Figure 1. Male sage-grouse lek attendance within northeastern Wyoming, 1967-2005.



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

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

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

4.2.5.2.3. Mountain plover

Mountain plover breeding and nesting habitat exists throughout the project area. Mineral development may have mixed effects on mountain plovers. Disturbed ground such as buried pipe line corridors and roads may be attractive to plovers while human activities within one-quarter mile may be disruptive. Use of roads and pipe line corridors by mountain plovers may increase their vulnerability to vehicle collision.

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

4.2.5.3. Cumulative effects

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

4.3. West Nile Virus Direct and Indirect Effects

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

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

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

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

4.4. Water Resources

The operator has submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts within the Upper Powder River watershed and a commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Qualified hydrologists developed the water management plan. Adherence with the plan, in addition to BLM applied mitigation (in the form of COAs), should minimize project area and downstream potential impacts from proposed water management strategies.

The WDEQ has assumed primacy from United States Environmental Protection Agency for maintaining the water quality in the waters of the state. The WSEO has authority for regulating water rights issues and permitting impoundments for the containment of surface waters of the state.

The maximum water production is predicted to be 15 gpm per well or 1230 gpm (2.7 cfs or 1951 acre-feet per year) for the 82 wells in 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 volume predicted to be produced within the watershed was 163,521 acre-feet in 2007. Maximum production was predicted to have occurred in 2006 with 171,423 acre-feet. The volume of water resulting from the production of these wells is 1.2% of the total volume projected for 2007. 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 492 gpm will infiltrate at or near the discharge points and impoundments (258,595,200 gallons per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater used for stock and domestic purposes. According to the PRB FEIS, "…the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater." (PRB FEIS pg 4-54). However, there is potential for infiltration of produced water to influence the quality of the antecedent groundwater. The WDEQ requires that operators determine initial groundwater quality below impoundments to be used for CBNG produced water storage. If high quality water is detected (Class 3 or better) the operator is required to establish a groundwater monitoring program at those impoundments.

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

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring and Siting Requirements for Unlined Coalbed Methane Produced Water Impoundments" which was approved September, 2006. For WYPDES permits received by DEQ after the August 1st effective date, the BLM requires that operators comply with the current approved DEQ compliance monitoring guidance document prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

The PRB FEIS predicts that one of the environmental consequences of coal bed natural gas production is possible impacts to the groundwater. "The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of water wells in the area. The permitted water wells in the area produce from water bearing zones ranging in depth from 320 to 620 feet below the ground surface. As mitigation, the operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence of the proposed wells.

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

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

In order to determine the actual water quality of the producing formations in this POD, and to verify the

water analyses submitted for the pre-approval evaluation, the operator has committed to designate a reference well within the POD boundary. The well will be capable of being sampled at the wellhead. A sample will be collected at the wellhead for analysis within sixty days of initial production. A copy of the water analysis will be submitted to the BLM Authorizing Officer.

4.4.1.1. Groundwater Cumulative Effects:

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

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

4.4.2. Surface Water

The historic water quality averages for the Powder River at maximum and minimum flows for two gaging stations are shown in Table 4.5. The primary station is the USGS gage on the Powder River at Arvada. A second station, the USGS gage on Salt Creek near Sussex is also included for comparison because this gage, while not on the Powder River, provides an example of the quality of the water in a major tributary to the River near where the Dry Fork and Little Willow Creek enter the river. Salt Creek drains the "Salt Creek Oil Field", which has been producing oil and water since the early part of the 20th century. The table also shows Wyoming proposed numeric limits for the Powder River at the Montana state line for SAR, and EC. The groundwater limits for classes I through III are also listed. For more information concerning water quality in the Powder River Basin, see the PRB FEIS page 4-73, 4-85 and Appendix B.

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, Wyoming			
Historic Data Average at Maximum Flow		4.76	1797
Historic Data Average at Minimum Flow		7.83	3400
Salt Creek near Sussex, Wyoming			
Historic Data Average at Maximum Flow		18.9	5204
Historic Data Average at Minimum Flow		23.6	5668
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8)			
Drinking Water (Class I)	500		
Agricultural Use (Class II)	2,000	8	
Livestock Use (Class III)	5,000		
WDEQ Water Quality Requirement for WYPDES Permit # WY0054933			
At discharge point	5000	NS**	7500
Predicted Produced Water Quality			
Kaycee	2620	31.1	4010

Predicted Values	TDS, mg/l	SAR	EC, μmhos/cm
Edgerton	2130	17.7	3280
Midwest	3080	27	4590
Big George	3030	26.7	4570

**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 ranges from 2130 to 3080.0 mg/l TDS which is not within the WDEQ criteria for agricultural use (2000 mg/l TDS). However, the Jepson I development area is included as part of this POD's water management strategy. Jepson I has a 3.2 acre test plot of hybrid poplar trees being irrigated with CBNG product water. BLM is interested in the outcome of this test and has been granted authority to visit the site "…with proper notification to Windsor personnel." (E-mail communication from Patsy Ballek, Windsor Energy, to David Seward, BLM, on 5/19/2006, Jepson I POD.)

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

There are 26 discharge points proposed for this project. They have been appropriately sited and utilize appropriate water erosion dissipation designs. Existing and proposed water management facilities were evaluated for compliance with best management practices during the onsite.

This POD's primary water management strategy is containment for infiltration and evaporation with a small irrigation component.

To manage the produced water, 26 impoundments (764 acre-feet of storage) would be or have been constructed within the project area. These impoundments will have disturbed approximately 150 acres including the dam structures. Of these water impoundments, 25 are on-channel and one will be constructed off channel in what appears to be a sand blowout. Existing impoundments will be or have been upgraded to meet the requirements of the WSEO, WDEQ and the needs of the operator and the landowner. All water management facilities were evaluated for compliance with best management practices during the onsite.

The PRB FEIS assumes that 15% of the impounded water will re-surface as channel flow (PRB FEIS pg 4-74). Consequently, the volume of water produced from these wells may result in the addition of 0.41 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. Seepage from the impoundments will potentially allow for streambed enhancement through wetland-riparian species establishment. Sedimentation will occur in the impoundments, but would be controlled through a concerted monitoring and maintenance program. Phased reclamation plans for the impoundments will be submitted and approved on a site-specific, case-by-case basis as they are no longer needed for disposal of CBNG water, as required by BLM applied COAs.

Alternative (2A), the approved alternative in the Record of Decision for the PRB FEIS, states that the peak production of water discharged to the surface will occur in 2006 at a total contribution to the mainstem of the Upper Powder River of 68 cfs (PRB FEIS, page 4-86). The predicted maximum discharge rate from these 82 wells is anticipated to be a total of 1230 gpm or 2.7 cfs to impoundments. Using an assumed conveyance loss of 20% (PRB FEIS, page 4-74), the produced water re-surfacing in the Upper Powder River from this action (0.4 cfs) may add a maximum 0.3 cfs to the Upper Powder River flows, or 0.6% of the predicted total CBNG produced water contribution. This incremental flow rate is statistically below measurement capabilities for flow in the Upper Powder River except during periods of

low flow, such as late summer and winter (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). Measurement of this incremental increase in flow would necessitate the use of specialized tools and techniques.

The Western POD boundary lies along the Powder River. Water produced from these wells and stored in reservoirs within the POD boundary will seep into the drainages below them and may add measurable flows to the mainstem of the Upper Powder River. For more information regarding the maximum predicted water impacts to the Powder River resulting from the discharge of produced water, see Table 4-6 (PRB-FEIS pg 4-85).

Potential sedimentation build-up in the reservoirs would occur, but would be controlled through a concerted monitoring and maintenance program. Phased reclamation plans for the impoundments will be submitted and approved on a site-specific, case-by-case basis, as they are no longer necessary for disposal of CBNG water, as required by BLM applied COAs.

In the WMP portion of the POD, the operator provided an analysis of the potential development in the watershed above the project area (WMP page 8-9). Based on the area of the Little Willow Creek watershed above the POD (7 sq mi) and an assumed density of 4 wells per location (four different coal seams) every 80 acres, the potential exists for the development of 224 wells which could produce a maximum produced water rate of 3360 gpm or 7.5 cfs, using the operator's estimate of 15 gpm per well. (However, if these coal seams were co-mingled in a single bore, using one pump and the operator's estimate of 15 gpm per well, the maximum water production rate would only be 840 gpm or 1.9 cfs.) The BLM agrees with the operator that this is not expected to occur because:

1. Some of these wells have already been drilled and are producing.
2. New wells will be phased in over several years, and
3. A decline in well discharge generally occurs after several months of operation.

The potential maximum volume of produced water within the watershed upstream of the project area, 4 cfs, is much less than the volume of run off estimated from the 2-year storm event for these watersheds.

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 for the discharge of water produced from this project from the WDEQ.

Permit effluent limits are set for WYPDES permit WY0054933 at Part I pages 2-3:

Effluent Characteristic	Limits for Outfalls 001, 003-005, 022-024, 027-029	002, 006-021, 025-026, 031	003
Chlorides, mg/l	150	150	2000
pH, standard units	6.5-9.0	6.5-9.0	6.5-9.0
Specific Conductance, µS/cm	7500	7500	7500
Total Recoverable Arsenic, µg/l	7	7	
Total Recoverable Barium, µg/l	1800	1800	
Total Dissolved Solids,mg/l	5000	5000	5000
Total Recoverable Radium 226+228, pCi/li	1		
Dissolved Iron, µg/l	300	1000	

The WYPDES permit also addresses existing downstream concerns, such as irrigation use, by prohibiting intentional discharge for any reason other than storm event overflow.

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 operator stated that no natural springs were identified within the project area or a ½ mile radius of the project boundary. However, a saline seep was identified immediately down stream of the proposed Botieff Dam.

In-channel downstream impacts are addressed in the WMP for the Jepson II POD prepared by CBM Associates, Inc. for Windsor Energy Group, LLC.

4.4.2.1. Surface Water Cumulative Effects

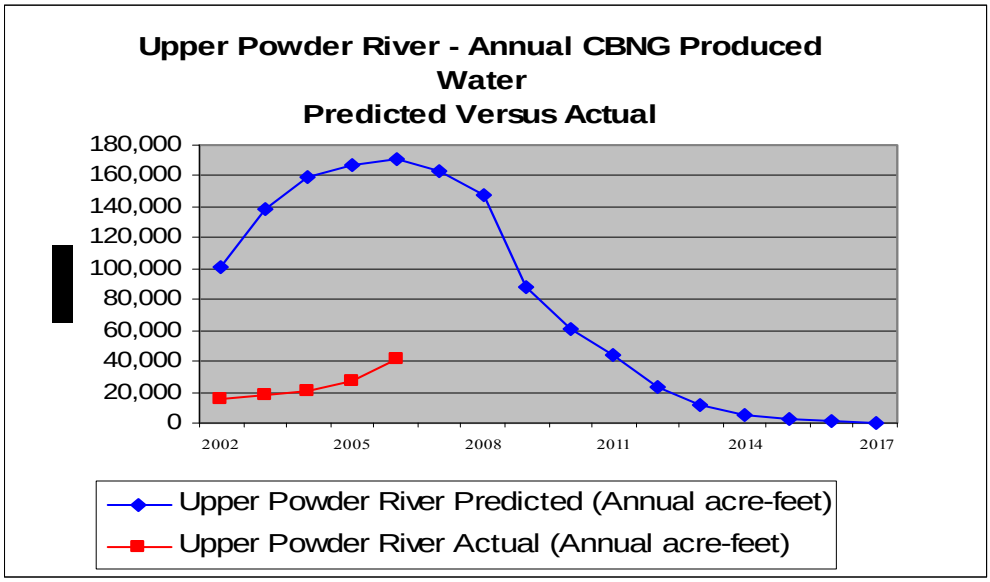
The analysis in this section includes cumulative data from Fee, State and Federal CBNG development in the Upper Powder River watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

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

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

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2002	100,512	100,512	15,846	15.8	15,846	15.8
2003	137,942	238,454	18,578	13.5	34,424	14.4
2004	159,034	397,488	20,991	13.2	55,414	13.9
2005	167,608	565,096	27,640	16.5	83,054	14.7
2006	171,423	736,519	40,930	23.9	123,984	16.8
2007	163,521	900,040				
2008	147,481	1,047,521				
2009	88,046	1,135,567				
2010	60,319	1,195,886				
2011	44,169	1,240,055				
2012	23,697	1,263,752				
2013	12,169	1,275,921				
2014	5,672	1,281,593				
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				
Total	**1,285,233**		**123,984**			

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

As referenced above, the PRB FEIS did disclose that cumulative impacts may occur as a result of discharged produced CBNG water. The cumulative effects relative to this project are anticipated to be within the parameter of 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 approximately 17% 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.

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 beginning on page 117 for cumulative effects common to all sub-watersheds.

4.5. Cultural Resources

Seven sites were recommended Eligible to the National Register: 48 JO 1, 128, 2936, 2994, 3635, 3638, and 3647. Potential impacts were identified near 48 JO 1 and 128, but will be avoided by project re-design. Site 48 JO 3635 has a portion of the site area evaluated as Contributing to Site Eligibility, but the Contributing portion is outside the area of effect for an existing road and utility corridor which will be constructed along the west side of the site boundary. No disturbance is currently proposed which will impact the other four sites, but any construction changes which are later found to affect any of the remaining sites will require mitigation or re-design.

Conditions of Approval:

1. 48 JO 1: Two sections of fencing will be installed to control vehicle access, and avoid stone circle features. All linear disturbance between access road and well pad will be required to use vehicle access corridor between fencing.
2. 48 JO 128: A utility corridor will be constructed on north side of access corridor per original POD design.
3. 48 JO 3635: Two recommendations have been made regarding this site:
    a. Re-route the access corridor and utility corridor to the west by at least ten meters, or
    b. Monitor utility trench and road construction through the cultural site boundary, with a gravel treatment or other fill material in the roadway to reduce erosion.

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

5. CONSULTATION/COORDINATION

Contact	Title	Organization	Present at Onsite
Alan Shultz	Resource Manager	Windsor Energy Group	Yes
Chris Ewert	Project Manager	CBMA	Yes
Brad Rogers	Fish and Wildlife Biologist	U. S. Fish and Wildlife Service	No

6. OTHER PERMITS REQUIRED

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

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