FINDING OF NO SIGNIFICANT IMPACT & DECISION RECORD
FOR
Williams Production RMT Company
South Prong Unit (SPU) 3 Federal
ENVIRONMENTAL ASSESSMENT –WY-070-EA**07-070**

DECISION: Is to approve Alternative C as described in the attached Environmental Assessment (EA) and authorize Williams Production RMT Company's South Prong Unit (SPU) 3 Federal Coal Bed Natural Gas (CBNG) POD comprised of the following 38 Applications for Permit to Drill (APDs) for CBNG and 3 APDs for ground water monitoring wells (MON = Monitor Well), as follows:

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
1	SOUTH PRONG UNIT 3 SPU	14-26BG	SWSW	26	49N	76W	WYW153074
2	SOUTH PRONG UNIT 3 SPU	23-26BG	NESW	26	49N	76W	WYW153074
3	SOUTH PRONG UNIT 3 SPU	33-26BG MON	NWSE	26	49N	76W	WYW153074
4	SOUTH PRONG UNIT 3 SPU	33-26GW MON	NWSE	26	49N	76W	WYW153074
5	SOUTH PRONG UNIT 3 SPU	33-26S MON	NWSE	26	49N	76W	WYW153074
6	SOUTH PRONG UNIT 3 SPU	34-26BG	SWSE	26	49N	76W	WYW153074
7	SOUTH PRONG UNIT 3 SPU	34-26GW	SWSE	26	49N	76W	WYW153074
8	SOUTH PRONG UNIT 3 SPU	43-26BG	NESE	26	49N	76W	WYW151166
9	SOUTH PRONG UNIT 3 SPU	43-26GW	NESE	26	49N	76W	WYW151166
10	SOUTH PRONG UNIT 3 SPU	34-27BG	SWSE	27	49N	76W	WYW153074
11	SOUTH PRONG UNIT 3 SPU	43-27BG	NESE	27	49N	76W	WYW153074
12	SOUTH PRONG UNIT 3 SPU	32-27BG	SWNE	27	49N	76W	WYW153074
13	SOUTH PRONG UNIT 3 SPU	12-33BG	SWNW	33	49N	76W	WYW146289
14	SOUTH PRONG UNIT 3 SPU	14-33BG	SWSW	33	49N	76W	WYW153072
15	SOUTH PRONG UNIT 3 SPU	21-33BG	NENW	33	49N	76W	WYW153075
16	SOUTH PRONG UNIT 3 SPU	23-33BG	NESW	33	49N	76W	WYW153072
17	SOUTH PRONG UNIT 3 SPU	32-33BG	SWNE	33	49N	76W	WYW153075
18	SOUTH PRONG UNIT 3 SPU	34-33BG	SWSE	33	49N	76W	WYW153072
19	SOUTH PRONG UNIT 3 SPU	41-33BG	NENE	33	49N	76W	WYW146289
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22	SOUTH PRONG UNIT 3 SPU	14-34BG	SWSW	34	49N	76W	WYW153072
23	SOUTH PRONG UNIT 3 SPU	21-34BG	NENW	34	49N	76W	WYW127800
24	SOUTH PRONG UNIT 3 SPU	23-34BG	NESW	34	49N	76W	WYW153072
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27	SOUTH PRONG UNIT 3 SPU	43-34BG	NESE	34	49N	76W	WYW153072
28	SOUTH PRONG UNIT 3 SPU	12-35BG	SWNW	35	49N	76W	WYW127800
29	SOUTH PRONG UNIT 3 SPU	14-35BG	SWSW	35	49N	76W	WYW127800
30	SOUTH PRONG UNIT 3 SPU	21-35BG	NENW	35	49N	76W	WYW127800
31	SOUTH PRONG UNIT 3 SPU	21-35GW	NENW	35	49N	76W	WYW127800
32	SOUTH PRONG UNIT 3 SPU	23-35BG	NESW	35	49N	76W	WYW127800

	Well Name	Well #	Qtr/Qtr	Sec	TWP	RNG	Lease #
33	SOUTH PRONG UNIT 3 SPU	23-35GW	NESW	35	49N	76W	WYW127800
34	SOUTH PRONG UNIT 3 SPU	32-35BG	SWNE	35	49N	76W	WYW127800
35	SOUTH PRONG UNIT 3 SPU	32-35GW	SWNE	35	49N	76W	WYW127800
36	SOUTH PRONG UNIT 3 SPU	34-35BG	SWSE	35	49N	76W	WYW127800
37	SOUTH PRONG UNIT 3 SPU	34-35GW	SWSE	35	49N	76W	WYW127800
38	SOUTH PRONG UNIT 3 SPU	41-35BG	NENE	35	49N	76W	WYW127800
39	SOUTH PRONG UNIT 3 SPU	41-35GW	NENE	35	49N	76W	WYW127800
40	SOUTH PRONG UNIT 3 SPU	43-35BG	NESE	35	49N	76W	WYW127800
41	SOUTH PRONG UNIT 3 SPU	43-35GW	NESE	35	49N	76W	WYW127800

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

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

1. The Operator, in their POD, has committed to:
    - Comply with all applicable Federal, State and Local laws and regulations.
    - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
    - Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
    - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowner(s).
3. Alternative C will not result in any undue or unnecessary environmental degradation.
4. It is in the public interest to approve these wells, as the leases are being drained of federal gas, resulting in a loss of revenue for the government.
5. Mitigation measures applied by the BLM will alleviate or minimize environmental impacts.
6. Alternative C is the environmentally-preferred Alternative.
7. The proposed action is in conformance with the PRB FEIS and the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management (BLM), Buffalo Field Office, April 2001.
8. Based on current information, we determined that no significant impacts in the spread of WNV would occur from the implementation of this project.

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

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

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

Field Manager:_____ Date: _____

BUREAU OF LAND MANAGEMENT
BUFFALO FIELD OFFICE
ENVIRONMENTAL ASSESSMENT (EA)
FOR
Williams Production RMT Company
South Prong Unit (SPU) 3 Federal
PLAN OF DEVELOPMENT
WY-070-EA07-070

INTRODUCTION

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

1. PURPOSE AND NEED

The purpose for the proposal is to define and produce coal bed natural gas (CBNG) on several 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. It is the continuing policy of the Federal Government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources; as set forth in the Mining and Minerals Policy Act of 1970. In addition the Energy Policy Act of 2005 encourages the development of the nation's domestic energy resources to reduce the United States dependence of foreign energy sources.

The purpose for the monitor wells is to gather information on groundwater drawdown as a result of CBNG development.

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

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

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1. Alternative A - No Action

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

2.2. Alternative B Proposed Action

Description of the Proposed Action

Proposed Action Title/Type: Williams Production RMT Company's South Prong Unit (SPU) 3 Federal Plan of Development (POD) for 42 coal bed natural gas well APD's, 3 BLM monitor well APD's, and associated infrastructure.

Proposed Well Information: There are 45 wells proposed within this POD, as follows:

	Well Name	Well Number	Qtr/Qtr	Section	TWP	RNG	Lease Number
1	SOUTH PRONG UNIT 3 SPU	23-25BG	NESW	25	49N	76W	WYW151166
2	SOUTH PRONG UNIT 3 SPU	23-25GW	NESW	25	49N	76W	WYW151166
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15	SOUTH PRONG UNIT 3 SPU	32-27BG	SWNE	27	49N	76W	WYW153074
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25	SOUTH PRONG UNIT 3 SPU	14-34BG	SWSW	34	49N	76W	WYW153072
26	SOUTH PRONG UNIT 3 SPU	21-34BG	NENW	34	49N	76W	WYW127800
27	SOUTH PRONG UNIT 3 SPU	23-34BG	NESW	34	49N	76W	WYW153072
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33	SOUTH PRONG UNIT 3 SPU	14-35BG	SWSW	35	49N	76W	WYW127800
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	Well Name	Well Number	Qtr/Qtr	Section	TWP	RNG	Lease Number
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42	SOUTH PRONG UNIT 3 SPU	41-35BG	NENE	35	49N	76W	WYW127800
43	SOUTH PRONG UNIT 3 SPU	41-35GW	NENE	35	49N	76W	WYW127800
44	SOUTH PRONG UNIT 3 SPU	43-35BG	NESE	35	49N	76W	WYW127800
45	SOUTH PRONG UNIT 3 SPU	43-35GW	NESE	35	49N	76W	WYW127800

County: Campbell

Applicant: Williams Production RMT Company

Surface Owners: Dave Belus, W. Mankin, Don and Betty Rice, Barrett Resources c/o Williams Production, US DOI/BLM

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

- Drilling of 45 total federal CBM wells with 2 wells being drilled at each location with the first well in the Big George coal seam (wells ending with BG = Big George) and the second well in the Gates/Wall coal seam (wells ending with GW = Gates/Wall). The Big George coal seam lies approximately 1102 feet to 1544 feet below ground surface. The Gates/Wall coal seam lies approximately 1640 feet to 1756 feet below ground surface.

- An unimproved and improved road network.

- Development of 3 deep groundwater monitor wells.

- A Water Management Plan (WMP) that involves the following infrastructure and strategy: all produced water will be piped to Schoonover Road Unit PODs 2, 3 and 5. No new dams or outfalls will be constructed as a result of this project.

- A buried gas, water and combination of below ground and above ground power line network.

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. Provide water well agreements to the owners of record for permitted water wells within the area of influence of the action.
4. Provide water analysis from a designated reference well in each coal zone.

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

The following Right-of-Way applications that are associated with this project have been received and are currently being processed.

- WYW169728
- WYW169729

2.3. Alternative C – Environmentally Preferred

Alternative C represents a modification of Alternative B based on the operator and BLM working cooperatively to reduce environmental impacts. The description of Alternative C is the same as Alternative B with the addition of the project modifications identified below.

BLM notified Williams that South Prong III would adversely affect sage-grouse and requested that Williams modify their project proposal to reduce direct habitat loss and human activities. Williams proposed the following project modifications:

- Williams will monitor West Nile virus by installing mosquito traps at all reservoirs within a 2-mile radius of the 12-35-4976 BG/GW wells during mosquito season. If Culex tarsalis is identified the reservoirs will be treated with larvacide and monitoring will continue throughout the mosquito season. Williams will submit a summary report to the BFO and the Northeast Wyoming Greater Sage Grouse Local Working Group regardless of findings.

- Williams re-examined the three phase overhead lines initially proposed throughout the project area. Three phase overhead powerlines were reduced from 4.7 miles to 3.5 miles.

- The existing 2-track road ("Pumper Loop Rd") from the 21-35-4976BG/GW North to the 23-26-4976BG/GW was initially proposed as access and proposed corridor. The corridors along this existing road have been dropped from the project. The road will remain a 2-track and would be utilized for access to the 23-26-4976/BG/GW wells. Access and pipeline associated with the 21-35 would be from the south. Disturbance to sage-grouse habitat would be decreased by 2.7 acres.

- The corridor south of the 21-35-4976BG/GW wells was removed from the project, decreasing disturbance to sage-grouse habitat by 1.0 acre.

- Williams has proposed to experiment with the Spider Plow for the installation of all pipelines within sage-grouse habitats. The Spider Plow is a new plow that has the ability to trench pipelines by direct plow-in methods reducing the width of disturbance and leaving a clear path with virtually no surface damage (www.jfcson.com).

At the on-sites, all areas of proposed surface disturbance were inspected to alleviate 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 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 South Prong Unit (SPU) 3 Federal POD are listed below under 2.3.1:

2.3.1. Changes as a result of the on-sites

1. The following 4 wells were dropped from the project leaving 38 proposed wells

	Well Name	Well #	Qtr/Qtr	Section	TWP	RNG	Lease #
1	SOUTH PRONG UNIT 3 SPU	23-25BG	NESW	25	49N	76W	WYW151166
2	SOUTH PRONG UNIT 3 SPU	23-25GW	NESW	25	49N	76W	WYW151166
3	SOUTH PRONG UNIT 3 SPU	34-34BG	SWSE	34	49N	76W	WYW153072
4	SOUTH PRONG UNIT 3 SPU	23-26GW	NESW	26	49N	76W	WYW153074

2. The following 3 wells were added to the project for monitoring purposes. The monitor wells associated with the South Prong Unit 3 POD will be drilled and completed 60 days prior to initiating pumping of production wells in the South Prong Unit 3 Plan of Development. Please see monitor well drilling guidelines (Section F) in the Standard Conditions of Approval.

	Well Name	Well #	Qtr/Qtr	Section	TWP	RNG	Lease #
1	SOUTH PRONG UNIT 3 SPU	33-26BG MON	NWSE	26	49N	76W	WYW153074
2	SOUTH PRONG UNIT 3 SPU	33-26GW MON	NWSE	26	49N	76W	WYW153074
3	SOUTH PRONG UNIT 3 SPU	33-26S MON	NWSE	26	49N	76W	WYW153074

3. **SPU 14-26BG – The original route was dropped** and Williams will use an existing pipeline ROW on Punkie Draw in Section 35; T49N R76W.
4. **SPU 23-26BG/GW – GW well to be dropped** because there is no physical room available with the existing pipeline that is in place.
5. **SPU 33-26BG/GW and Sand MON – Wells to be for monitoring purposes; added to project**
6. **SPU 23-25BG/GW – Dropped due to proximity to a raptor nest.**
7. SPU 32-34BG – Per landowner the original proposed access road to be used to avoid steep crossing; Monitoring of road and well site for interim reclamation as soils are classified as badlands and are susceptible to wind erosion.
8. SPU 41-33BG – The utility crossing proposed here will be moved to the south using the already existing Opti-gas ROW.
9. SPU 32-33BG – The road and pipeline will be terraced as to reduce the need to cut down ridge line to get wide enough for pipe and road. The road will be on top and the pipeline to be on the side slope.
10. SPU 43-33BG – Access moved to follow existing pipeline route
11. SPU 14-33BG – Location moved slightly uphill to a more level location; changed well to the 13-33BG as it is in the next qtr/qtr.
12. SPU 23-33BG – Location moved to be next to the main road and location to be a drive thru location. Will still need a pad to facilitate turnaround of vehicles. This change is due to Petro-Canada's pipeline being in place and the grade of the road couldn't be reduced enough for safe travel without exposing the line.
13. SPU 12-33BG – Location to be more of a slot location as Petro-Canada's existing pipeline will not

allow for a dirt balanced pad to be built.

14. SPU 14-35BG – Access road to come thru fence in an area with no sagebrush then angle back to the Southwest which will avoid habitat fragmentation of the sagebrush and the existing gate at the top of the hill is at a 90º angle and the drilling rig will not be able to navigate the corner.
15. **SPU 34-34BG – Location dropped** as location is on a side slope in a blow out area and there is enough wells surrounding the area to recover the CBNG resource.
16. SPU 41-34BG – Moved location ~150ft to Southeast as the location was too close to the existing dry hole marker of a plugged and abandoned well. Location moved by Rex Lynde of Williams Production.
17. SPU 21-35 BG/GW – Pipeline to go North to the 23-26 location and no pipeline from powerdrop to the south to the 21-35 well; for drilling purposes the equipment will use the road coming from 23-26 location, which will eliminate the need to upgrade the road going south across Punkie Draw.

2.3.2. Programmatic mitigation measures identified in the PRB FEIS ROD

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

2.3.2.1. 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 have been addressed in Schoonover Road Unit PODs 2, 3, and 5.

2.3.2.2. Soils

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

2.3.2.3. 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.).

2.3.2.4. Wetland/Riparian

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

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

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

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

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

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

2.3.2.5. Wildlife

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

2.3.2.6. Threatened, Endangered, or Sensitive Species

2.3.2.6.1. Bald Eagle

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

2. Surveys for active bald eagle nests and winter roost sites will be conducted within suitable habitat by a BLM approved biologist. Surface disturbing activities will not be permitted within one mile of suitable habitat prior to survey completion.

2.3.2.6.2. Mountain Plover

1. Project-related features that encourage or enhance the hunting efficiency of predators of mountain plover will not be constructed within ¼ mile of known mountain plover nest sites.

2. Construction of ancillary facilities (for example, compressor stations, processing plants) will not be located within ½ mile of known nesting areas. The threats of vehicle collision to adult plovers and their broods will be minimized, especially within breeding aggregation areas.

3. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.

4. Creation of hunting perches or nest sites for avian predators within 0.5 mile of identified nesting areas will be avoided by burying power lines, using the lowest possible structures for fences and other structures and by incorporating perch-inhibiting devices into their design.

5. When above ground markers are used on capped and abandoned wells they will identified with markers no taller than four feet with perch inhibiting devices on the top to avoid creation of raptor hunting perches within 0.5 mile of nesting areas.

6. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.

2.3.2.7. Visual Resources

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

2.3.2.8. 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.

2.3.2.9. 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.

Surface Use

1. The following wells will maintain a 20ft undisturbed vegetative buffer between the edge of disturbance and edge of drainage.

	Well Name	Well #	Qtr/Qtr	Section	TWP	RNG	Lease #
1	SOUTH PRONG UNIT 3 SPU	43-26BG	NESE	26	49N	76W	WYW151166
2	SOUTH PRONG UNIT 3 SPU	32-35GW	SWNE	35	49N	76W	WYW127800

2. For those proposed disturbance areas identified below, there are lands with limited reclamation potential that shall be stabilized in a manner which eliminates accelerated erosion until a self-perpetuating non-weed, native plant community has stabilized the site in accordance with the Wyoming Reclamation Policy. Stabilization efforts shall be finished within 30 days of the initiation of construction activities.

   Well name(s):
   - South Prong Unit 3 SPU 32-33-4976BG
   - South Prong Unit 3 SPU 32-34-4976BG

   Road / Pipeline section (s):
   - Access Rd/Corridor to SPU 32-33 in sections 33 & 34.
   - Access Rd/Corridor to SPU 32-34 in section 34 from SPU 21-34

3. 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 South Prong Unit 3 POD is Convert Green, 18-0617 TPX.
4. The operator will drill seed on the contour to a depth of 0.5 inch, followed by cultipaction to compact the seedbed, preventing soil and seed losses. To maintain quality and purity, the current years tested, certified seed with a minimum germination rate of 80% and a minimum purity of 90% will be used. On BLM surface or in lieu of a different specific mix desired by the surface owner, use the following:

Species - *Cultivar*	**% in Mix**	**Lbs PLS**
Western Wheatgrass - *Rosana*	30	3.6
Bluebunch Wheatgrass – *Secar or P-7*	10	1.2
Green needlegrass - *Lodorm*	25	3.0
Slender Wheatgrass	20	2.4
White – *Antelope* or Purple Prairie Clover – *Bismarck*	5	0.6
Prairie coneflower	5	0.6
Rocky Mountain beeplant	5	0.6
Totals	**100%**	**12 lbs/acre**

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

5. The Upper High Noon impoundment must be bonded prior to any SPU 3 water being discharged.

6. Please contact Mary Maddux Natural Resource Specialist, @ (307) 684-1164, Bureau of Land Management, Buffalo, if there are any questions concerning these surface use COAs.

Wildlife:

1. If any dead or injured sensitive species is located during construction or operation, the BLM Buffalo Field Office (307-684-1100) shall be notified within 24 hours.
2. The Record of Decision for the Powder River Basin EIS includes a programmatic mitigation measure that states, "The companies will conduct clearance surveys for threatened and endangered or other special-concern species at the optimum time". 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, Williams will coordinate with the BLM to determine if additional surveys will be required.
3. The following conditions will minimize impacts to nesting and roosting bald eagles;
    a. Surveys for bald eagle roost and nest sites are required annually within one mile of Dead Horse Creek until project completion.
    b. 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. A seasonal minimum disturbance buffer zone of 1-mile will be established for all bald eagle 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.
    c. If a nest is identified and construction has not been completed, a minimum 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).
    d. 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.
4. The following conditions will minimize impacts to raptors;
    a. No surface disturbing activity (including completion and enhancement work) 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 affects the following;

Township/Range	Section	Wells and Infrastructure
49/76	25	The 23-5 well and its associated infrastructure and all roads and pipelines.
49/76	26	The utility road corridor to the 43-27 well, the 23-26 well and its associated infrastructure, the 33-26 well and its associated infrastructure north and south to the 34-26 well, the 34-26 and 43-26 and their associated infrastructure, all overhead powerlines and power drops, low water crossings, and all other roads and pipelines within the sections.
49/76	27	All over head power lines and power drops northeast of the 43-27 well.
49/76	33	The 12-33, 32-33, 43-33, 34-33, 14-33, 23-33 wells and their associated infrastructure, all overhead powerlines and power drops, and all infrastructure associated with the 41-33 well.
49/76	34	The 23-34 and 14-34 wells and their associated infrastructure,

Township/Range	Section	Wells and Infrastructure
		infrastructure south of the 12-34 well, and all overhead powerlines and power drops.
49/76	36	All roads and pipelines

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

c. Nest productivity checks shall be completed for all raptor nests within the South Prong Unit 3 POD listed in the table below. The productivity checks shall be completed for the first five years following project completion. The occupancy checks shall be conducted no earlier than June 1 or later than June 30 and any evidence of nesting success/production shall be recorded. Survey results will be submitted to a Buffalo BLM biologist in writing no later than July 31 of each survey year.

BLM ID	UTM E	UTM N	Species
648	4893262	424112	GOEA
3811	4892238	424643	UNK
3812	4893918	422751	UNK
3813	4893509	422650	RTHA
3814	4893159	424204	GOEA
3815	4894060	422677	UNK
3816	4893884	422943	UNK
3817	4893937	422956	RTHA
3818	4894173	422818	UNK
2681	4891888	419654	RTHA
3396	4891498	420127	RTHA
3819	4891639	419533	RTHA
2682	4894520	421640	RTHA
2677	4894921	420868	RTHA
3820	4895010	420812	RTHA
3821	424469	4892314	RTHA

d. Routine maintenance should be scheduled outside the nesting season (Feb 1-July 31) for all active nests. Emergency activities should be reduced as much as possible and restricted between the hours of 9:00 am and 3:00 pm.

5. A mountain plover nesting survey is desired in suitable habitat prior to commencement of surface disturbing activities in the prairie dog towns located in Sections 3, 26, and 35 of Township 49 North, Range 76 West. If the survey is not conducted prior to commencement of surface disturbing activities, it shall be conducted during the first breeding season following POD approval. No surface disturbing activities are permitted in suitable habitat areas listed above, from March 15-July 31, until a mountain plover nesting survey has been conducted for the current breeding season. This affects all wells and their associated infrastructure and reservoirs located within 0.25 miles of a prairie dog colony.

a. If a mountain plover is identified, then a seasonal disturbance-free buffer of ¼ mile shall be maintained between March 15 and July 31. If no mountain plovers are identified, then surface disturbing activities may be permitted within suitable habitat until the following breeding season (March 15).
b. Work schedules and shift changes will be set to avoid the periods from 30 minutes before to 30 minutes after sunrise and sunset during June and July, when mountain plovers and other wildlife are most active.
c. Reclamation of areas of previously suitable mountain plover habitat will include the seeding of vegetation to produce suitable habitat for mountain plover.

6. No surface disturbing activity shall occur the within the four black-tailed prairie dog colonies located in Sections 3, 26, and 35 of Township 49 North, Range 76 West from April 15 through August 31, annually, prior to a burrowing owl nest occupancy survey for the current breeding season. This will affect all wells and their associated infrastructure within 0.25 miles of a prairie dog colony. If a burrowing owl nest is located, a 0.25 mile timing restriction will be placed around the nest from April 15 to August 31.

7. The following conditions will minimize impacts to sage-grouse:
   a. Sage-grouse surveys are required throughout the project area for the current breeding season and results reviewed by a BLM biologist. This condition will be implemented on an annual basis for the duration of surface disturbing activities.
   b. If an active lek is identified during the survey, the 2 mile timing restriction (March 1-June 15) will be applied and surface disturbing activities will not be permitted until after the nesting season.
   c. No surface disturbance or disruptive activities shall occur within sage-grouse winter habitat areas from November 15-March 14 to reduce stress during this sensitive period. This timing limitation affects the following areas: the entire POD. Disruptive activities include, but are not limited to the following examples; actions that require personnel to be within winter habitats for extended periods of time (greater than one hour) during the winter season in a site specific area (e.g. land surveys, project construction, geophysical activities, sustained loud noise, etc.).

   If the Morgan Draw lek (T48N:R76W:S11) is active, the following will be affected;

Township/Range	*Section*	*Affected Wells and infrastructure*
49/76	34	The 32-34, 23-34, 14-34, 34-34, 43-34, 41-34 wells and their associated infrastructure overhead power lines and power drops, and cattle guards.
49/76	35	The 12-35, 21-35, 23-35, 14-35, 32-35, 43-35, 43-35, 34-35 wells and their associated infrastructure, overhead power, power drops, and low water crossings.
49/76	36	All roads and pipelines.
48/76	3	All roads, pipelines, and cattle guards.

8. The following conditions will minimize impacts to sharp-tail-grouse:
   a. Sharp-tail grouse surveys are required throughout the project area on an annual basis. If an active lek is identified during the survey, the 0.64 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 0.5 mile buffer until the following breeding season (April 1). The required sharp-tailed grouse survey

will be conducted by a biologist following WGFD protocol. All survey results shall be submitted in writing to a Buffalo BLM biologist and approved prior to surface disturbing activities.

b. Creation of raptor hunting perches will be avoided within 0.64 miles of documented sharp-tailed grouse lek sites. Perch inhibitors will be installed to deter avian predators from preying on grouse.

2.4. Alternatives considered but not analyzed in detail

The operator did not discuss potential water management alternatives such as treatment or injection in their water management plan.

3. DESCRIPTION OF AFFECTED ENVIRONMENT

Applications to drill were received on 5/31/06. Field inspections of the proposed South Prong Unit (SPU) 3 Federal CBM project were conducted on 10/26/2006, 10/27/2006, 11/7/2006 by:

NAME	ORGANIZATION	DATES PRESENT
Duane Joslyn	Williams Production RMT	10/26-27
Richard Jarvis	Williams Production RMT	10/26 & 11/7
Jim Mobly	Williams Production RMT	10/26-27 & 11/7
Penny Bellah	Williams Production RMT	10/27
Rex Lynde	Williams Production RMT	10/26-27 & 11/7
Scott Martens	Williams Production RMT	10/27 & 11/7
Jason Putnum	Williams Production RMT	11/7
Allen Aksamit	Western Land Services	10/26-27 & 11/7
Rich Kinitzi	Western Land Services	10/26-27 & 11/7
Dave Belus	Landowner	10/26-27
Andy Belus	Landowner	10/26
Ben Adams	BLM	10/26
Arlene Kosic	BLM	10/26-27 & 11/7
Arnie Irwin	BLM	10/26-27 & 11/7
Leigh Grench	BLM	10/26
Mary Maddux	BLM	10/26-27 & 11/7

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			Arlene Kosic
Floodplains	X			Ben Adams
Wilderness Values			X	Mary Maddux
ACECs			X	Mary Maddux
Water Resources	X			Ben Adams
Air Quality		X		Mary Maddux

Mandatory Item	Potentially Impacted	No Impact	Not Present On Site	BLM Evaluator
Cultural or Historical Values		X		Leigh Grench
Prime or Unique Farmlands			X	Mary Maddux
Wild & Scenic Rivers			X	Mary Maddux
Wetland/Riparian	X			Ben Adams
Native American Religious Concerns		X		Leigh Grench
Hazardous Wastes or Solids		X		Mary Maddux
Invasive, Nonnative Species	X			Mary Maddux
Environmental Justice			X	Mary Maddux

3.1. Topographic Characteristics of Project Area

The South Prong Unit 3 POD area is located South of Interstate 90 from Barber Creek Road Exit. The POD is bordered on the west side by the Wild Turkey CBNG Unit and the Schoonover Road CBNG Unit to the south.

The topography varies from relatively flat areas of the Dead Horse Creek Drainage to the north to ridge tops with steep slopes. Two prominent draws dissect the project area with the first being Government Draw on the west side and the second being Punkie Draw on the east side. Elevation varies from 4,100 to 4,600 feet above sea level. The primary use of the area is currently livestock grazing.

3.2. Vegetation & Soils

Species typical of short grass prairie comprise the project area flora. Specific species observed throughout the project area varies with ecological site, soil type, aspect and topography. 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 landforms and the soils of this site have been identified as varying from a miscellaneous to a loamy within the project area. Soils will differ with topographic location, slope and elevation. Topsoil depths to be salvaged for reclamation range from 0 to 4 inches on ridges to 8+ inches in bottomland. Erosion potential varies from minor to moderate depending on the soil type, vegetative cover and slope and is discussed in each of the following sections. Reclamation potential of soils also varies throughout the project area.

Soils within the project area were identified from the *South Campbell County Survey Area, Wyoming.* The soil survey was performed by the Natural Resource Conservation Service according to National Cooperative Soil Survey standards. Pertinent information for analysis was obtained from the published soil survey and the National Soils Information System (NASIS) database for the area.

Dominate soils affected by the proposed action include:

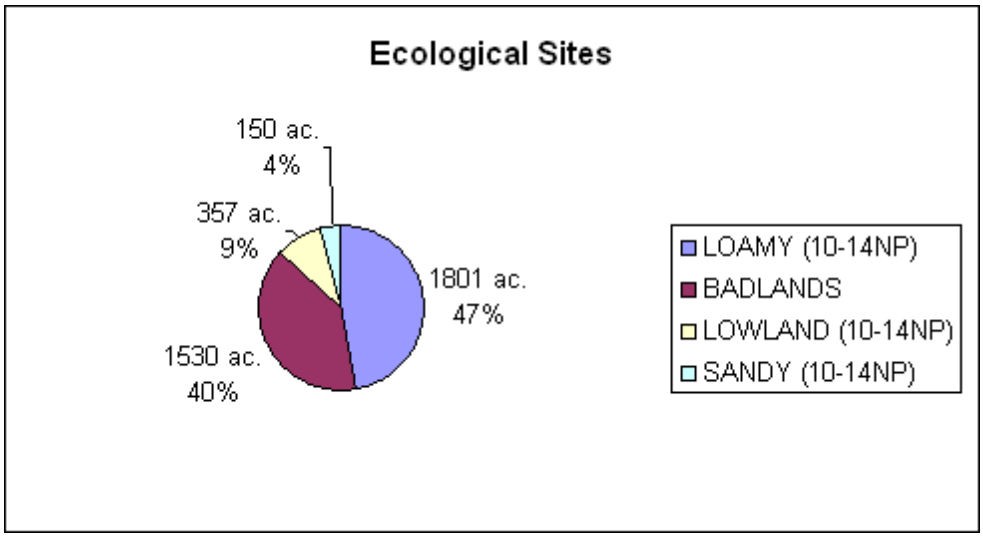
Soil Map Units	Acres
233 Ustic Torriorthents, gullied	1530
217 Theedle-Shingle loams, 3 to 30 percent slopes	1038
153 Haverdad-Kishona association, 0 to 6 percent slopes	357
117 Cambria-Kishona-Zigweid loams, 6 to 15 percent slopes	279
158 Hiland-Bowbac fine sandy loams, 6 to 15 percent slopes	150
147 Forkwood-Cushman loams, 6 to 15 percent slopes	145
216 Theedle-Kishona-Shingle loams, 3 to 30 percent slopes	101

For more detailed soil information, see the NRCS Soil Survey 605 – Southern Campbell County.

Dominate Ecological Sites and Plant Communities identified in this POD and its infrastructure are predominately loamy-mixed sagebrush/grass (47%) and miscellaneous areas described as Badlands (40%).

South Prong Ecological Sites

Ecological Site	Acres
LOAMY (10-14NP)	1801
BADLANDS	1530
LOWLAND (10-14NP)	357
SANDY (10-14NP)	150



Loamy Sites:
This site occurs on gently undulating to rolling land which includes landforms such as hill sides, alluvial fans, ridges and stream terraces, in the 10-14 inch precipitation zone.

The soils of this site are moderately deep to deep (greater than 20" to bedrock), well drained soils that formed in alluvium and residuum. These soils have moderate permeability and may occur on all slopes. The main soil limitations include low organic matter content and soil droughtiness.

The present plant community is a Mixed Sagebrush/Grass.

Dominant grasses identified include: Western wheatgrass, Green needlegrass, Bluebunch wheatgrass and threadleaf sedge. Forbs identified include: Western yarrow and milkvetches. Other vegetative species identified at onsite include: Wyoming Big sagebrush and plains pricklypear.

Wyoming big sagebrush is a significant component of this Mixed Sagebrush/Grass plant community. Cool-season grasses make up the majority of the understory with the balance made up of short warm-season grasses, annual cool-season grass, and miscellaneous forbs. These areas can be reclaimed by traditional methods identified in the programmatic and standard conditions of approval (COA's) relative to reclamation and applying the appropriate "Best Management Practices".

"Miscellaneous Areas"*, Badlands*:
This site occurs on steep slopes and ridge tops, but may occur on all slopes which include landforms such as hillsides, ridges, and escarpments. Badlands have essentially no soil and support little or no vegetation. Steep or very steep, commonly nonstony, barren land dissected by many intermittent drainage channels. Badlands is most common in semiarid and arid regions where streams are entrenched in soft geologic material. Local relief generally ranges from 25 to 500 feet. Runoff potential is very high, and geologic erosion is active.

3.2.1. Wetlands/Riparian
A small area of wetland/riparian area exists within this POD's boundary along Dead Horse Creek. This area is characterized by a wide floodplain with a base-flow channel meandering through it. Mature cottonwoods grow in relatively high numbers, although regeneration is sparse to non-existent, possibly due to the lack of regular overbank flood events during the last decade.

3.2.2. Invasive Species
Two types of the knapweed species of state-listed noxious weeds and invasive/exotic plant infestations were discovered by a search of inventory maps and databases compiled by the University of Wyoming and modified to reflect local conditions by BLM Range Conservationist and Johnson County Weed and Pest Weed Specialist or during subsequent field investigation by the proposed project proponent. The area has potential for invasion of diffuse knapweed and spotted knapweed. No weeds were observed during the onsite investigations.

3.3. Wildlife
A habitat assessment and wildlife inventory surveys were performed by Western Land Services (Western). Western performed surveys for bald eagles, mountain plover, sharp-tailed grouse, greater sage-grouse, raptor nests, prairie dog colonies, and Ute ladies'-tresses orchid according to protocol in 2006.

A BLM Biologist conducted a field visits on October 17, 27 and November 7 of 2006. During this time, she reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project adjustment recommendations where wildlife issues arose.

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

3.3.1. Big Game
Big game species expected to be within the project area include pronghorn antelope and mule deer. The project area is part of the Gillette pronghorn antelope and Powder River mule deer herds. There was a 2004 population estimate of 13,985 pronghorn antelope and a population objective of 11,000. The 2004 population estimate for the Powder River mule deer herd was 55,560 and an objective of 52,000 (WGFD 2004). The WGFD has determined the project area to be Yearlong and Winter Yearlong range for pronghorn antelope and mule deer.

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.

Winter/Yearlong use is when a population of animals makes general use of suitable habitat sites within a 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. 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 South Prong Unit 3 project area is located within the Beaver Creek, Dead Horse Creek, and Burger Draw watersheds. All three drainages are tributaries to the Powder River and are ephemeral to intermittent streams.

3.3.3. Migratory Birds

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

3.3.4. Raptors

Raptors species expected to occur in suitable habitats within the project area include northern harrier, golden eagle, red-tailed hawk, Swainson's hawk, ferruginous hawk, American kestrel, prairie falcon, short-eared owl, great horned owl, osprey, bald eagle, rough-legged hawk, merlin, and burrowing owl. Most raptor species nest in a variety of habitats including but not limited to; native and non-native grasslands, agricultural lands, live and dead trees, cliff faces, rock outcrops, and tree cavities (PRB FEIS 3-145-148).

The BLM database and TJS identified 16 raptor nests within 0.5 miles of the South Prong Unit 3 project area. Table 4 lists the species and activity status of these nests in 2006.

Raptor Nests identified within 0.5 miles of the South Prong Unit 3 POD.

BLM ID	UTM E	UTM N	Species	2006 Activity	Distance from wells
648	4893262	424112	GOEA	Active	450 ft
3811	4892238	424643	UNK	Inactive	0.11 mi
3812	4893918	422751	UNK	Inactive	0.35 mi
3813	4893509	422650	RTHA	Inactive	450 ft
3814	4893159	424204	GOEA	Inactive	890 ft
3815	4894060	422677	UNK	Inactive	0.35 mi
3816	4893884	422943	UNK	Inactive	0.42 mi
3817	4893937	422956	RTHA	Inactive	0.39 mi
3818	4894173	422818	UNK	Inactive	0.5 mi
2681	4891888	419654	RTHA	Active	0.22 mi
3396	4891498	420127	RTHA	Inactive	0.20 mi
3819	4891639	419533	RTHA	Inactive	0.13 mi
2682	4894520	421640	RTHA	Inactive	0.52 mi
2677	4894921	420868	RTHA	Active	0.71 mi
3820	4895010	420812	RTHA	Inactive	0.8 mi
3821	424469	4892314	RTHA	Inactive	0.19 mi

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).

Active reintroduction efforts of black-footed ferrets 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 BFO administrative area as potential black-footed ferret reintroduction sites (Oakleaf 1988). Today, 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 Western Mountains (Grenier 2003). The USFWS has also concluded that black-tailed prairie dog colonies within Wyoming are unlikely to be inhabited by black-footed ferrets (Kelly 2004).

Four prairie dog towns totaling 40 acres where identified within the project area. Two of the towns are occupied and two of the towns have been poisoned by the landowner. The landowner routinely controls the towns on his private surface.

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. A decision is expected in June 2007.

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 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 South Prong Unit 3 project area is suitable for bald eagle roosting and nesting. Field surveys conducted determined potential roost habitat is present in cottonwood communities along Dead Horse Creek. No bald eagle roost or nest sites are documented in the BLM databases or were identified during surveys conducted in 2005 or 2006 within the project area. The closest bald eagles observation is documented 5.5 miles northwest of the project area.

3.3.5.1.3. Ute's Ladies Tresses Orchid

This orchid is listed as Threatened under the Endangered Species Act. It is extremely rare and occurs in moist, sub-irrigated or seasonally flooded soils at elevations between 1,780 and 6,800 feet above sea

level. Habitat includes wet meadows, abandoned stream channels, valley bottoms, gravel bars, and near lakes or perennial streams that become inundated during large precipitation events. Prior to 2005, only four orchid populations had been documented within Wyoming. Five additional sites were located in 2005 and one in 2006 (Heidel pers. Comm.). The new locations were in the same drainages as the original populations, with two on the same tributary and within a few miles of an original location. Drainages with documented orchid populations include Antelope Creek in northern Converse County, Bear Creek in northern Laramie and southern Goshen Counties, Horse Creek in Laramie County, and Niobrara River in Niobrara County.

The South Prong Unit 3 project area is located within the Beaver Creek, Dead Horse Creek, and Burger Draw watersheds. All three drainages are tributaries to the Powder River and are ephemeral to intermittent streams.

3.3.5.2. Sensitive Species

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

3.3.5.2.1. Black-tailed prairie dog

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

Four prairie dog towns were identified within the South Prong Unit 3 project area. Two of the towns are occupied and two of the towns have been poisoned by the landowner. The landowner routinely controls the towns on his private surface. The size, activity status, and locations of the towns are listed below.

Section	Township/Range	Acres	Activity
35	49/76	10	Occupied
35	49/76	10	Poisoned
26	49/79	10	Poisoned
3	Outside of POD	10	Occupied

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). Sage-grouse attend traditional courtship areas called leks which are in or adjacent to sage-brush dominated habitat. Several lek sites form clusters defined as a lek complex. Sage-grouse may be expected to interchange within a lek complex, visiting one lek site to another from one day to the next. Lek sites within a complex are usually < 3 km from one another. Lek complexes are clearly spatially separated from adjacent lek complexes by 6 km. (Schroeder et al. 2000)

The South Prong Unit 3 project area is highly suited for sage-grouse breeding, nesting, and wintering grounds. Habitats within the South Prong Unit 3 project area are comprised of 60% sagebrush shrublands. Dense, moderately dense, and sparse stands of Wyoming big sagebrush mixed with a variety of grasses and forbs occur throughout the project area.

The Morgan Draw lek is located 0.70 miles south of the project area. Sage-grouse were observed displaying during 6 of 7 surveys conducted by Western in 2005 and 2006. Additionally, there are 5 occupied lek sites less than 4.0 miles from the project area. The Napier lek site is located 2.4 miles south, the Watsabaugh IV and Barber Creek leks are located 3.3 miles northeast, and the Laskie Draw and Laskie Draw East leks are located 3.7 miles east of the project area.

3.3.5.2.3. Mountain plover

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

Suitable mountain plover habitat is present within the South Prong Unit 3 project area. Four prairie dog towns exist within the project area. Surveys were conducted in 2004 and 2005. 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
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 is physically located along Government Draw, Punkie Draw and several unnamed draws which are tributaries to Dead Horse Creek. Dead Horse Creek is a major ephemeral tributary 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 infiltrated 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 has 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 have been installed and monitored jointly by the BLM and USGS since August, 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 indicate increasing levels of TDS and other inorganic constituents over a six month period resulting in changes from the initial WDEQ classifications.

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

Through the independent deep groundwater monitoring program being carried out by the BLM and the WSEO, information on lowered water levels (drawdown of the static water levels in wells completed within the coal seam) and on the status of the sand aquifers is being obtained and tracked. As part of the ROD for the Wyodak Coal Bed Methane Project EIS (approved 1999), industry agreed to drill and equip up to two well pairs or triples per township. The three monitor wells being proposed in Section 26 of T49N R76W is a continuation of that agreement.

A search of the Wyoming State Engineer Office (WSEO) Ground Water Rights Database for this area showed ___18___ registered stock and domestic water wells within the POD boundary with depths ranging from 90 to 2527 feet. For additional information on water, please refer to the PRB FEIS (January 2003), -Chapter 3, Affected Environment pages 3-1 through 3-36 (groundwater).

3.5.2. Surface Water

The project area is within the Dead Horse Creek drainage, which is tributary to the Upper Powder River. All of the drainages in the area are ephemeral (flowing only in response to a precipitation event or snow melt – PRB FEIS Chapter 9 Glossary). The channels are primarily well vegetated grassy swales, without defined beds and banks, except that Dead Horse Creek itself has a well defined channel which carries the normal flows it experiences most years.

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 1797µmhos/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 recorded at the USGS station located on the Powder River at Arvada, Wyoming (PRB FEIS page 3-49).

No natural springs were found by the operator within one-half mile of the POD boundary.

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

3.6. Cultural Resources

Class III cultural resource inventories were conducted for the South Prong Unit (SPU) 3 Federal project prior to on-the-ground project work (BFO project no. 70060216). Western Lands Services, Inc. conducted a block Class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) for the project.

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

Table 3.5 Cultural Resources Inventory Results:

Site Number	Site Type	Eligibility
48CA6198	Prehistoric Lithic Scatter	Not Eligible
48CA6199	Prehistoric Lithic Scatter	Not Eligible
48CA6200	Prehistoric Lithic Scatter	Not Eligible
48CA6201	Prehistoric Lithic and FCR Scatter	Not Eligible
48CA6202	Prehistoric Lithic Scatter	Not Eligible
48CA6203	Prehistoric Lithic Scatter	Not Eligible
48CA6204	Late Archaic Lithic Scatter	Not Eligible
48CA6205	Historic Homestead	Not Eligible
48CA6206	Prehistoric Lithic Scatter	Not Eligible
48CA6207	Multi-component Historic Debris and Prehistoric Lithic Scatter	Not Eligible
48CA6208	Prehistoric Lithic Scatter	Not Eligible
48CA6209	Middle to Late Archaic Lithic Scatter	Not Eligible
48CA6210	Historic Homestead/Dug Out	Not Eligible
48CA6211	Prehistoric Open Camp	**Eligible**
48CA6212	Late Prehistoric Open Camp	**Eligible**
48CA6213	Prehistoric Lithic Scatter	Not Eligible

3.7. Visual Resource Management

Visual Resource Management (VRM) is a basic tool used by the BLM to inventory and manage visual resources on public lands. There are four VRM classes, each of which combines and evaluates visual

quality, visual sensitivity of the area, and view distances. The VRM classes are objectives that outline the amount of disturbance and area can tolerate before it no longer meets the objectives of the class (PRB FEIS, Vol. 1 pg. 3-253).

South Prong Unit 3 POD is located inside Class II, Class III and Class IV VRM areas. The objectives of VRM classes within the POD are:

- Class II objectives are to retain the existing character of the landscape. Contrasts are seen, but must not attract attention.

- Class III objectives are to partially retain the existing character of the landscape. Activities may be visually obvious but should not dominate the view.

- Class IV objectives are to provide for major modification to the existing landscape and allow management activities to dominate the landscape.

The South Prong Unit 3 POD is located on the east side of the Powder River, and South of Interstate 90. The project is more or less dissected by VRM classes II & III with the very south portion of the project being in VRM class IV. The lands sensitive to public view are located in the Class II area and this project is on the very eastern edge of that class.

3.8. Recreation/Travel Management

Historic land uses within the project area include cattle grazing, mineral development, and big game hunting, which is the principal recreational activity on federal, state, and private lands in the Project Area. Public lands in much of the Buffalo Field Office consist of isolated tracts of land managed by the BLM that are too small to provide a quality recreation experience. The South Prong Unit 3 and Schoonover Road Unit 5 project areas are located in one of the larger areas of accessible public land, which is attractive to recreation users and provides for more adequate dispersed recreation and a quality recreational experience. Dispersed recreation use includes hunting, hiking, driving for pleasure, ATV use, sightseeing, camping, and wildlife viewing.

There is no motorized public access to the South Prong Unit 3 POD. The project area can be accessed from private roads that intersect with the Schoonover and Dead Horse County roads. Access to the project area is possible by means of non-motorized transportation, such as hiking or horseback, from Schoonover Road.

A previously created road extending north from the Schoonover Road used for access into the Schoonover Road Unit 5 POD also serves as the primary access road to the South Prong Unit 3 development. There are private roads that access the project area from the north and west boundaries of the project area. Land owner permission is required for travel on these roads accessing the project area. New roads have been constructed surrounding the project area to provide for CBNG extraction.

The Buffalo RMP designates travel in this area as a “Limited Area A: Use is limited to roads and vehicle routes in existence as of the date of the 1985 Buffalo Resource Management Plan”. Recent resource management plan maintenance further defined existing roads as those roads and vehicle routes illustrated on the 1989-1991 Surface Management Status Maps. The RMP, states that “Using motorized vehicles requires no fee and no permit, but their use is restricted depending on whether the area has been designated closed, limited or open”. Off road travel is not authorized in this area.

4. ENVIRONMENTAL CONSEQUENCES

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

4.1. Surface Resources

4.1.1. Vegetation

Overall impacts to vegetation and soils from surface disturbance would be reduced, based on the operator's plans and BLM applied mitigation. Of the 41 proposed well locations, 38 can be drilled without a well pad being constructed and 3 will require a constructed (cut & fill) well pad. Surface disturbance would occur with the drilling of the 38 wells without constructed pads. This disturbance would involve digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction (estimated approximate size of 42 x 42 feet), and compaction (from vehicles driving/parking at the drill site). Estimated disturbance associated with these 38 wells would involve approximately 0.4 acre/well for 15.2 total acres. The other 3 wells requiring cut & fill pad construction would disturb approximately a total of 2.29 acres. The total estimated disturbance for all 41 wells would be 17.5 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 9.47 miles of improved roads would be constructed to provide access to various well locations. Approximately 8.05 miles of new and existing primitive roads 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 4.70 miles of overhead power lines would also be constructed. Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures (e.g., waterbars, water wings, culverts, rip-rap, etc.) would ensure land productivity/stability is regained and maximized.

Proposed stream crossings, including culverts and 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, engineering practices and BLM standards.

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

Table 4.1 summarizes the proposed surface disturbance.

Table 4.1 - SUMMARY OF DISTURBANCE

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Nonconstructed Pad Constructed Pad	35 3	0.4/acre or Site Specific	14.0 2.29	Long Term
Gather/Metering	0	Site Specific	0	Long Term

Facility	Number or Miles	Factor	Acreage of Disturbance	Duration of Disturbance
Facilities				
Screw Compressors	0	Site Specific	0	Long Term
Monitor Wells	3	0.4/acre	1.2	Long Term
Impoundments On-channel Off-channel Water Discharge Points	 0 0 0 0	 Site Specific Site Specific Site Specific or 0.01 ac/WDP	 0.0 0.0 0.0	Long Term
Channel Disturbance Headcut Mitigation Channel Modification	 0 0	 Site Specific Site Specific	 0.0 0.0	
Improved Roads No Corridor With Corridor	 0 9.47 miles	 40' Width or Site Specific	 0 71.87	Long Term
Primitive Roads No Corridor With Corridor	 0.97 7.08 miles	 14' Width or Site Specific 40' Width or Site Specific	 1.64 34.33	Long Term
Pipelines No Corridor In Corridor w/o road	 0 0.73 miles	 50' Width or Site Specific	 0 4.42	Short Term
Buried Power Cable No Corridor	 0	 12' Width or Site Specific	 0	Short Term
Overhead Powerlines	3.5 miles	30' Width	12.7	Long Term
Additional Disturbance	0	Site Specific	0	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".

4.1.2. Soils

Under alternative C 38 CBNG federal wells and 3 monitor wells would be drilled (see description of alternatives). The topographical, ecological and soils in this area are diverse. There are many areas which will be reclaimed by traditional methods. However, some areas will be challenging for reclamation due to soil properties and/or site characteristics. The proponent planned their project to some extent and the BLM may further recommendations on the onsite to avoid those areas where possible. However the proposed action will affect some areas of soils with a limited potential for successful reclamation. Disturbances within these areas require the programmatic/standard COA's be complimented with a site specific performance based reclamation related COA.

The proposed action was designed to avoid these highly erosive soils which having a low potential for successful reclamation.

The Bureau of Land Management has an obligation to protect these lands from disturbance which could lead to irretrievable and irreversible impacts. The areas identified as potentially having a highly erosive map unit were identified at the onsite and avoided to the greatest extent possible in the permitting process.

Direct and Indirect Effects: Direct and indirect effects resulting from well pad, access roads, pipelines, and other activities include: mixing of soil horizons, loss of soil vegetative cover, organic matter and productivity, increased susceptibility of the soil to erosion, soil compaction, and modification of hillslope hydrology. Soil productivity would be eliminated along improved roads and restricted along primitive roads until successful final reclamation is achieved. Estimated disturbance associated with the South Prong Unit 3 POD is summarized in Table 4.1.

Soil horizon mixing may result where construction of roads, pipelines or other activities occur. Mixing of horizons may result in moving organic matter and nutrients at depths out of reach of surface plants or may be destroyed. Horizon mixing may bring soil texture and structure to the surface that are more susceptible to wind and water erosion. If soil structure is destroyed, surface infiltration by water and air may be affected. Inorganic compounds, such as carbonates and other salts, or unweathered material may be brought to the surface which could effect seed germination, plant health and viability.

Soil erosion would affect soil health and productivity. Erosion rates are site specific and are dependent on soil, climate, topography, and cover. Expedient reclamation of disturbed land with salvaged topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with use of erosion control measures would help ensure soil productivity and stability will be regained in the shortest timeframe.

Soil compaction by vehicle traffic results in the collapse of soil pores reducing the transmissivity of water and air. Compaction decreases infiltration thus increasing runoff and hazard of water erosion. The potential for compaction is greatest when soils are wet. Factors affecting compaction include soil texture, moisture, organic matter, clay content and type, pressure exerted, and the number of passes by vehicle traffic or machinery. Compaction in these areas may be reduced by remedial action such as plowing or ripping.

Soil disturbances other than permanent facilities would be short term with expedient, successful reclamation and site stabilization. Construction activities would be designed following Best Management Practices (BMPs) to control erosion and sedimentation; erosion control measures would be maintained and continued until adequate vegetation cover is re-established; removal of vegetation would be conducted only when necessary and reseeded following the BLM seeding policy and BLM Wyoming Reclamation Policy.

Cumulative Effects: Most soil disturbances would be short term, and have minor impacts with expedient, successful interim reclamation and site stabilization, as committed to by the operator in their POD Surface Use Plan and as required by BLM in COAs. Construction activities associated with the Proposed Action would impact approximately 4.4 acres during the short term (<5 yrs) and approximately 133.9 acres in the long term (>5 yrs).

4.1.3. Wetland/Riparian

While this project will not create wetlands or riparian areas through construction of dams and outfalls, it will add produced water to previously evaluated outfalls, reservoirs and irrigation systems. A number of these facilities are located in ephemeral tributaries to Dead Horse Creek. Eventually, seepage and surface runoff from these facilities could reach the wetland and riparian areas in Dead Horse Creek itself.

The PRB FEIS identified effects to gallery forests of mature cottonwood trees stating that "…(they) may be lost by bank undercutting caused by the increased surface water flows in channels." Included in the ROD is programmatic mitigation "…which *may be* appropriate to apply at the time of APD approval if site specific conditions warrant."(ROD page A-30). One of the conditions included in that section addresses the impact to trees in A.5.8-2: "To reduce adverse effects on existing wetlands and riparian areas, water discharge should not be allowed if increased discharge volumes or subsequent recharge of shallow aquifers will inundate and kill woody species, such as willows or cottonwoods."(ROD Page A-32).

"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).

4.1.4. 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. Diffuse and spotted knapweed has been found in the area however, mitigation as required by BLM applied COAs will ensure that potential impacts from noxious weeds and invasive plants will be reduced.

4.1.5. Cumulative Effects

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

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

- They are proportional to the actual amount of cumulatively produced water in the Upper Powder River drainage and the total amount that was predicted in the PRB FEIS, which is only approximately 15% of that total (see section 4.4.2.1).
- The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
- The commitment by the operator to monitor the volume of water flowing into Dead Horse Creek, Beaver Creek and their tributaries, and to construct additional downstream reservoirs, if

necessary, to prevent significant volumes of water from flowing into the Upper Powder River.

- The WMP for the South Prong Unit (SPU) 3 Federal proposes that produced water will not contribute significantly to flows downstream.

No additional mitigation measures are required.

4.2. Wildlife

EFFECTS ANALYSIS

During the environmental analysis process, the BLM identified project modifications resulting in an environmentally preferred alternative (Alternative C). At the on-sites, all areas of proposed surface disturbance were inspected to ensure that potential impacts to natural resources would be reduced. In some cases, access roads were re-routed, well locations, pipelines, discharge points and other water management control structures were moved, modified, mitigated or dropped from the project design in order to alleviate environmental impacts.

4.2.1. Big Game Direct and Indirect Effects

Under the environmentally preferred alternative, Yearlong and Winter Yearlong range for pronghorn antelope and mule deer will 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 may provide some habitat value as these areas are reclaimed and native vegetation becomes established. Although, when these reclaimed areas are located along road sides, vehicular collisions may increase.

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

The water management plan for the South Prong Unit 3 POD will utilize existing infrastructure approved within the Schoonover Road Unit (SRU) PODs which include SRU 2, 3, and 5. CBNG water will be piped and contained in existing reservoirs, piped to an existing irrigation system, or directly discharged into existing discharge points located within Beaver Creek. All existing reservoirs and pits will be operated on a full-containment basis with no downstream flow allowed, unless as a result of runoff associated with a large precipitation event (Western Land Services 2007). CBNG water is not expected to reach any of the drainages within the project area. Aquatic species should not be affected by implementation of the South Prong Unit 3 POD.

4.2.2.1. Cumulative effects

The cumulative effects associated with Alternative C are within the analysis parameters and impacts described in the PRB FEIS. For details on expected cumulative impacts, please refer to the referenced PRB FEIS, Volume 2, Chapter 4, page 4-247. No additional mitigation measures are required.

4.2.3. Migratory Birds Direct and Indirect Effects

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

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

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

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

4.2.3.1. Cumulative effects

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

4.2.4. Raptors Direct and Indirect Effects

Eight nests are located less than 0.25 miles from proposed wells and infrastructure. Due to topography only 2 of the eight nests are visible from wells or roads. The 23-26 well is located 0.13 miles from a nest

and the access road was originally proposed within 30 feet of the nest. The well was moved a short distance and the operator agreed to use the road for drilling purposes only. Once drilling is completed, an alternate road will be used. A timing restriction will be placed on this well, drilling will not be conducted during the nesting season. The 43-33 well is located 0.21 miles from a nest and in direct line of sight. The well could not be moved.

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.

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.

Despite commitments such as telemetry metering to limit well visits, well visits during the nesting season will occur 2 to 3 times per week which may lead to nest failure through nest abandonment, displacement, and increased predation. Additional direct and indirect impacts to raptors, from oil and gas development, are analyzed in the PRB FEIS (4-216-221).

4.2.4.1. 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 are summarized in Table 4.2.5.1. Threatened and Endangered Species potentially affected by the proposed project area are further discussed following the table.

4.2.5.1. Threatened and Endangered and Sensitive Species

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

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Endangered				
Black-footed ferret (*Mustela nigripes*)	Black-tailed prairie dog colonies or complexes > 1,000 acres.	NP	NE	Suitable habitat of insufficient size.
Threatened				
Bald eagle (*Haliaeetus leucocephalus*)	Mature forest cover often within one mile of large water body.	K	LAA	Overhead power and improved roads proposed.
Ute ladies'-tresses orchid (*Spiranthes diluvialis*)	Riparian areas with permanent water	NP	NE	Historically perennial water not present.

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

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

4.2.5.1.1. Black-footed ferret

The 14-34, 23-35, and 32-35 well heads and their utility roads are proposed in a prairie dog town. Disturbance to prairie dog and their habitat will occur from the implementation of this project. However, it is highly unlikely that ferrets are present and the suitable habitat is insufficient in size to support ferrets. Implementation of the proposed development should have "***no effect***" on the black-footed ferret.

4.2.5.1.2. Bald eagle

The proposed project is likely to affect bald eagles due to the presence of proposed powerlines. Williams proposes 4.7 miles of three phase overhead powerlines throughout the project area. Approximately 4.1 miles of overhead power exists within the project boundaries and over 12 miles of overhead power surrounds the project area. The wire spacing is likely in compliance with the Avian Power Line Interaction Committee's (1996) suggested practices and with the Service's standards (USFWS 2002).

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

The proposed project is "***likely to adversely affect*****"** bald eagles due to the presence of proposed and existing overhead powerlines lines.

4.2.5.1.3. Ute's Ladies Tresses Orchid

Produced water will be piped to existing reservoirs, pits, irrigation systems, and directly discharged into Dead Horse Creek. No springs or other potential orchid habitat is present within the project area. Implementation of the proposed project should have "***no effect***" on the Ute ladies'-tresses orchid as suitable habitat is not present.

4.2.5.2. Sensitive Species Direct and Indirect Effects

Table 4.3 Summary of Sensitive Species Habitat and Project Effects.

Common Name (scientific name)	Habitat	Presence	Project Effects	Rationale
Amphibians				
Northern leopard frog (*Rana pipiens*)	Beaver ponds, permanent water in plains and foothills	S	NI	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	S	MIIH	Sagebrush cover will be affected.
Burrowing owl (*Athene cunicularia*)	Grasslands, basin-prairie shrub	S	MIIH	Disturbance proposed in prairie dog towns.
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	S	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	Existing 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	MIIH	Disturbance proposed in 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

The 14-34, 23-35, and 32-35 well heads and their utility roads are proposed in two prairie dog towns. During construction of these facilities, there is the possibility that prairie dogs within these colonies may be killed as a direct result of the earth moving equipment. Constant noise and movement of equipment and the destruction of burrows puts considerable stress on the animals and will cause an increase in prairie dog mortalities. During the construction of these facilities individuals are exposed more frequently to predators and have less protective cover.

The well house and nearby power poles may provide habitats for mammal and avian predators increasing prairie dog predation. Mineral related traffic on the adjacent roads may result in prairie dog road mortalities.

4.2.5.2.2. Greater sage-grouse

BLM notified Williams that this project would adversely affect sage-grouse and requested that Williams modify their project proposal to reduce direct habitat loss and reduce human activities thereby alleviating some project effects. Williams proposed the following project modifications:

- Williams will monitor West Nile virus by installing mosquito traps at all reservoirs within a 2-mile radius of the 12-35-4976 BG/GW wells during mosquito season. If Culex tarsalis is identified the reservoirs will be treated with larvacide and monitoring will continue throughout the mosquito season. Williams will submit a summary report to the BFO and the Northeast Wyoming Greater Sage Grouse Local Working Group regardless of findings.

- Williams re-examined the three phase overhead lines initially proposed throughout the project area. Three phase overhead powerlines were reduced from 4.7 miles to 3.5 miles.

- The existing 2-track road ("Pumper Loop Rd") from the 21-35-4976BG/GW North to the 23-26-4976BG/GW was initially proposed as access and proposed corridor. The corridors along this existing road have been dropped from the project. The road will remain a 2-track and would be utilized for access to the 23-26-4976/BG/GW wells. Access and pipeline associated with the 21-35 would be from the south. Disturbance to sage-grouse habitat would be decreased by 2.7 acres.

- The corridor south of the 21-35-4976BG/GW wells was removed from the project, decreasing disturbance to sage-grouse habitat by 1.0 acre.

- Williams has proposed to experiment with the Spider Plow for the installation of all pipelines within sage-grouse habitats. The Spider Plow is a new plow that has the ability to trench pipelines by direct plow-in methods reducing the width of disturbance and leaving a clear path with virtually no surface damage (www.jfcson.com).

Table 1 (Alternate SUDs Form) below lists the road segments were Williams will attempt to utilize the Spider Plow. The table lists the widths of disturbance and acres of disturbance if the Spider Plow is successful. Additionally, the Spider Plow has the potential to be used within established right-of-ways to corridor pipelines with no additional disturbance. These areas are identified in the table as "E". If the Spider Plow is successful on each of the segments of roads proposed in Table 1, overall disturbance to sage-grouse habitat would decrease by 71 acres.

If rocks or hard ground are encountered, Williams will abandon the Spider Plow for conventional methods of trenching. The width of disturbance will then revert to their original proposal. Table 2 lists the original proposed road and corridor widths. Until the Spider Plow is on the ground and running the actual

decrease of sage-grouse habitat disturbance, if any can not be determined. Only the first 4 mitigation proposals above can be positively determined to reduce disturbance to sage-grouse habitat by 20.8 acres.

Table 1 . Alternate SUDs Form

Width of Disturbance Road & Corridor	Length of Road (ft)	Acres of Disturbance	Miles of Disturbance
P12	541	0.15	0.1
P12	1737	0.48	0.33
P12	1227	0.34	0.23
P12	729	0.2	0.14
P12	1663	0.46	0.31
P12	1993	0.55	0.38
P12	1919	0.53	0.36
P12	1543	0.43	0.29
E20	1881	0	0
P45	4093	4.23	0.78
P45	454	0.47	0.09
P12	327	0.09	0.06
E150	3606	0	0
P45	4277	4.42	0.81
E150	4421	0	0
E150	1342	0	0
P12	1188	0.33	0.23
P12	716	0.2	0.14
P12	345	0.1	0.07
P20	819	0.38	0.16
E150	4416	0	0
E70	5157	0	0
P30	623	0.43	0.12
P30	1780	1.23	0.34
P30	959	0.66	0.18
P30	2409	1.66	0.46
P30	2134	1.47	0.4
P45	3457	3.57	0.65
E70	2114	0	0
P20	717	0.33	0.14
E45	9343	0	0
P20	1223	0.56	0.23
P12	1893	0.52	0.36
P12	283	0.08	0.05
P20	2689	1.23	0.51
P12	475	0.13	0.09
E20	1289	0	0
Total	**75782**	**25.53**	**8.01**

Table 2. Original SUDs

Width of Disturbance Road & Corridor	Length of Road (ft)	Acres of Disturbance	Miles of Disturbance
P40	2392	2.2	0.45
P40	2322	2.13	0.44
P70	3694	5.94	0.7
P80	860	1.58	0.16
P80	4293	7.88	0.81
P40	1339	1.23	0.25
P40	977	0.9	0.18
P80	4622	8.49	0.88
P80	4764	8.75	0.9
P40	3217	2.95	0.61
P40*	**2902**	**0**	**0**
P80	8617	15.83	1.63
P40	3021	2.77	0.57
P40	1188	1.09	0.22
P40	1780	1.63	0.34
P40*	**1107**	**0**	**0**
P40	571	0.52	0.11
P40	819	0.75	0.16
P40	279	0.26	0.05
P40	522	0.48	0.1
P40	327	0.3	0.06
P40	1663	1.53	0.31
P40	729	0.67	0.14
P40	1227	1.13	0.23
P40	2708	2.49	0.51
P40	2025	1.86	0.38
P40	1993	1.83	0.38
P40	1543	1.42	0.29
P40	475	0.44	0.09
P40	283	0.26	0.05
P40	1919	1.76	0.36
P40	3208	2.95	0.61
P40	4277	3.93	0.81
P40	1888	1.73	0.36
P40	3693	3.39	0.14
P40	345	0.32	0.07
P40	1808	1.66	0.34
P50	2787	3.2	0.53
P50	755	0.87	0.48
P50	312	0.36	0.2
Total	**83251**	**97.48**	**14.9**

Width of Disturbance Road & Corridor	Length of Road (ft)	Acres of Disturbance	Miles of Disturbance

*** Dropped from project**

Project activities will result in the direct loss 117 acres of occupied year-round sage-grouse habitat. If the Spider Plow is successful, the disturbance would be decreased by 71 acres. The project would create extensive habitat fragmentation due to the introduction of new linear features (roads, pipelines, and overhead powerlines). Sage-grouse avoidance of these facilities produces even greater indirect habitat loss. Sage-grouse use of previously suitable habitat may decline. 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 and conducted by walking transects through sagebrush to discover nests.

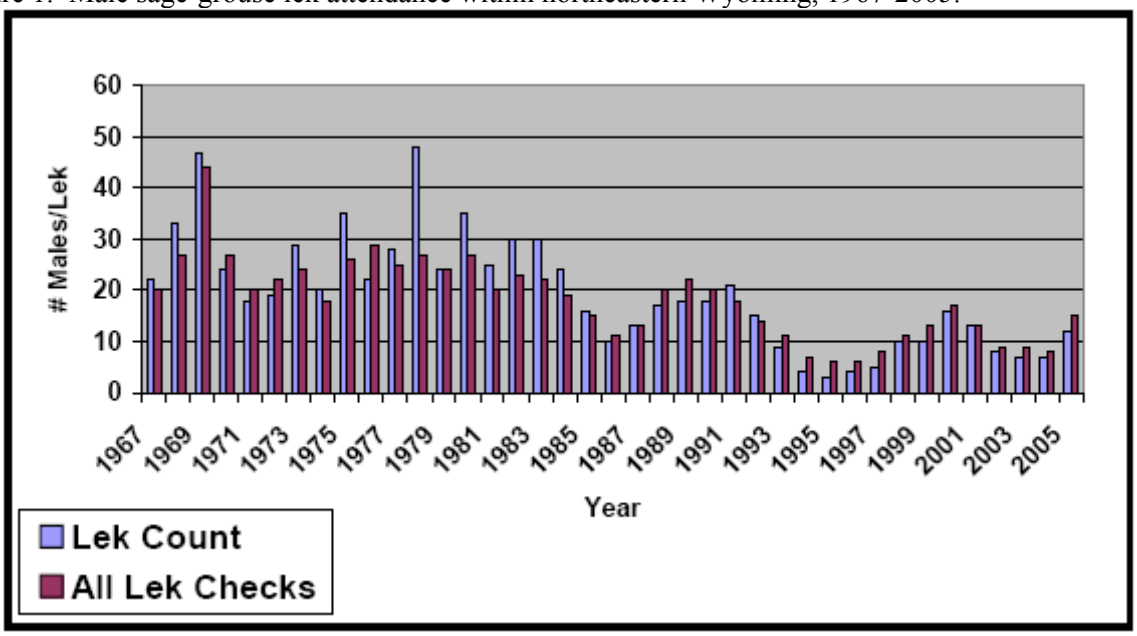
Additional studies, across more of the sage-grouse's range and using more advanced technology such as radio-telemetry, indicate that many populations nest much farther than two miles from the lek of breeding (Bennett 2004). Holloran and Anderson (2005), in their Upper Green River Basin study area, reported 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

Surface disturbing activities are proposed on the edge of two prairie dog colonies. Additional surveys will be required if disturbance is proposed during the mountain plover breeding season. The proposed project should not impact mountain plover nesting habitat.

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

4.3. West Nile Virus

The PRB FEIS and ROD included a programmatic mitigation measure that states, "The BLM will consult with appropriate state agencies regarding WNv. BLM has consulted with applicable state agencies, County Weed and Pest and the State Health Department, per above mitigation in the PRB ROD page 18, regarding the disease and the need to treat. BLM has also consulted with the researchers that are studying the dynamics of WNv species and its effects in Wyoming.

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

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

BLM will keep monitoring this issue by continuing to consult with the State agencies and the researchers working in the area in order to stay abreast of the most current developments and any need to apply mitigation. Based on current information, we determined that no significant impacts in the spread of WNv would occur from the implementation of this project.

4.4. Water Resources

The operator has submitted a comprehensive WMP for this project. It is incorporated-by-reference into this EA pursuant to 40 CFR 1502.21. The WMP incorporates sound water management practices, monitoring of downstream impacts within the Upper Powder River watershed and a commitment to comply with Wyoming State water laws/regulations. It also addresses potential impacts to the environment and landowner concerns. Qualified hydrologists developed the water management plan. Adherence with the plan, in addition to BLM applied mitigation (in the form of COAs), should minimize project area and downstream potential impacts from the 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 12.0 gpm per well or 456.0 gpm (1 cfs or 723 acre-feet per year) for this POD. The PRB FEIS projected the total amount of water that was anticipated to be produced from CBNG development per year (Table 2-8 Projected Amount of Water Produced from CBM Wells Under Alternatives 1, 2A and 2B pg 2-26). For the Upper Powder River drainage, the projected volume produced within the watershed area was 163,521 acre-feet in 2007 (maximum production is estimated in 2006 at 171,423 acre-feet). As such, the volume of water resulting from the production of these wells is 0.4% of the total volume projected for 2007. 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 182 gpm will infiltrate at or near the discharge points and impoundments (294 acre feet per year). This water will saturate the near surface alluvium and deeper formations prior to mixing with the groundwater used for stock and domestic purposes. According to the PRB FEIS, "…the increased volume of water recharging the underlying aquifers of the Wasatch and Fort Union Formations would be chemically similar to alluvial groundwater." (PRB FEIS pg 4-54). However, there is potential for infiltration of produced water to influence the quality of the antecedent groundwater.

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

In order to address the potential impacts from infiltration on shallow ground water, the Wyoming DEQ has developed a guidance document, "Compliance Monitoring for Ground Water Protection Beneath Unlined Coalbed Methane Produced Water Impoundments" (June 14, 2004) which can be accessed on their website. This guidance document became effective August 1, 2004. The Wyoming DEQ has also established an Impoundment Task Force which is in the process of drafting an "Impoundment Monitoring Plan" to investigate the potential for existing impoundments to have impacted shallow ground water. WYPDES permits received by DEQ prior to August 1, 2004, for discharging to impoundments will be assessed through the "Impoundment Monitoring Plan". For WYPDES permits received by DEQ after August 1, 2004, the BLM will require that operators comply with the requirements outlined in the DEQ compliance monitoring guidance document (June 14, 2004) prior to discharge of federally-produced water into newly constructed or upgraded impoundments.

The PRB FEIS predicts that an environmental consequences of coal bed natural gas production is impacts to the groundwater. "The effects of development of CBM on groundwater resources would be seen as a drop in the water level (drawdown) in nearby wells completed in the developed coal aquifers and underlying or overlying sand aquifers." (PRB FEIS page 4-1). In the process of dewatering the coal zone to increase natural gas recovery rates, this project may have some effect on the static water level of water wells in the area. The permitted water wells in the area produce from water bearing zones ranging in depth from 90 to 2527 feet below the ground surface. The targeted coal zones range from 1130 to 1863 feet below ground surface. As mitigation, the operator has committed to offer water well agreements to holders of properly permitted domestic and stock wells within the circle of influence of the proposed wells.

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

Deep groundwater monitoring is ongoing at numerous locations throughout the Powder River Basin. The goal of the information being gathered by BLM and/or WSEO is to provide a more accurate depiction of the actual drawdown that is occurring area wide. The monitor wells being installed into the target coal(s) and the sand formation are for monitoring purposes only and would not be influenced directly by pumping, as the CBNG production wells from which operators are getting their information.

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 Authorized 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). The deep groundwater monitoring network will continue to provide information on the cumulative effects of the drawdown on coal zone aquifers and overlying and underlying sand units in the Fort Union and Wasatch Formations.

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

4.4.2. Surface Water

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

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

Predicted Values	**TDS, mg/l**	**SAR**	**EC,** μmhos/cm
Most Restrictive Proposed Limit –		3	1000
Least Restrictive Proposed Limit		10	3000
Powder River at Arvada, WY Gauging station Historic Data Average at Maximum Flow Historic Data Average at Minimum Flow		 4.76 7.83	 1797 3400
WDEQ Quality Standards for Wyoming Groundwater (Chapter 8) Drinking Water (Class I) Agricultural Use (Class II) Livestock Use (Class III)	 500 2,000 5,000	 8	
WDEQ Water Quality Requirement for WYPDES Permit # WY0038733 At discharge point WYPDES Permit # WY0048321	NA	NA	7500

Predicted Values	TDS, mg/l	SAR	EC, μmhos/cm
At discharge point	5000	NA	7500
At Irrigation Compliance point	NA	6	2000
WYPDES Permit # WY0046922			
At discharge point	5000	NA	7500
WYPDES Permit # WY0050709			
At discharge point	5000	NA	7500
At Irrigation Compliance point	NA	6	2000
WYPDES Permit # WY0051462			
At discharge point	5000	NA	7500
At Irrigation Compliance point	NA	6	2000
Predicted Produced Water Quality			
Big George	1430	21.3	2240
Gates/Wall	1300	18.2	2010

Based on the analysis performed in the PRB FEIS, the primary beneficial use of the surface water in the Powder River Basin is the irrigation of crops (PRB FEIS pg 4-69). The water quality projected for this POD is 1430.0 mg/l TDS which is within the WDEQ criteria for agricultural use (2000 mg/l TDS). Direct land application is included as part of this proposal by means of the overarching water management strategy for the Schoonover Road Unit. Produced water is discharged into reservoirs and then pumped to center pivot irrigation systems located on private surface. The operator is presently irrigating land using water produced from fee well production and has stated that an irrigation monitoring and mitigation plan is in place for the land application disposal (LAD) portion of their water management strategy. Therefore, the operator and the landowner are aware of the potential impacts to the soils and the environment resulting from the application of water to the land surface. The addition of water produced as a result of the proposed federal action will have no other impacts on the land that the operator and landowner are not already aware of. The operator and landowner, therefore, will hold the BLM blameless for any and all reclamation and/or remediation costs associated with discharge of any waters produced as a result of this action.

The quality for the water produced from the Big George target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD and is not expected to be significantly different from the water quality of that produced as a result of the operator's fee development. A maximum of 12.0 gallons per minute (gpm) is projected is to be produced from these 30 wells, for a total of 360.0 gpm for the POD. See Table 4.5.

The quality for the water produced from the Gates/Wall target coal zone from these wells is predicted to be similar to the sample water quality collected from a location near the POD and is not expected to be significantly different from the water quality of that produced as a result of the operator's fee development. A maximum of 12.0 gpm is projected is to be produced from these 8 wells, for a total of 96.0 gpm for the POD. See Table 4.5.

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

There are no new discharge points or impoundments proposed for this project. All water will be discharged through facilities previously evaluated with other projects either previously submitted or yet to be submitted.

Alternative (2A), the approved alternative in the Record of Decision for the PRB FEIS, states that the peak production of water discharged to the surface will occur in 2006 at a total contribution to the

mainstem of the Upper Powder River of 68 cfs (PRB FEIS pg 4-86). The predicted maximum discharge rate from these 38 wells is anticipated to be a total of 456.0 gpm or 1 cfs to impoundments and Beaver Creek via facilities evaluated for other actions. Using an assumed conveyance loss of 20% (PRB FEIS pg 4-74) and assuming full containment, the produced water re-surfacing in the Powder River from this action (68 cfs) may add a maximum 0.12 cfs to the Upper Powder River flows, or 0.2% of the predicted total CBNG produced water contribution. This incremental volume is statistically below the measurement capabilities for the volume of flow of the Powder River (refer to Statistical Methods in Water Resources U.S. Geological Survey, Techniques of Water-Resources Investigations Book 4, Chapter A3 2002, D.R. Helsel and R.M. Hirsch authors). For more information regarding the maximum predicted water impacts resulting from the discharge of produced water, see Table 4-6 (PRB-FEIS pg 4-85).

In the WMP portion of the POD, the operator provided an analysis of the potential development in the watershed above the project area (WMP pages 12 and 13). Based on the area of the Dead Horse Creek watershed above the POD (133 sq mi) and an assumed density of 2 wells per location every 80 acres, the potential exists for the development of 2128 wells which could produce a maximum flow rate of 25,536 gpm (57 cfs) of water. Based on the area of the Beaver Creek watershed above the POD (114 sq mi) and an assumed density of 2 wells per location every 80 acres, the potential exists for the development of 1824 wells which could produce a maximum flow rate of 21,888 gpm (49 cfs) of water. Total potential production for these two watersheds could be 106 cfs, which would constitute a significant contribution to the Powder River. However, the BLM agrees with the operator that this is not expected to occur because:

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

The potential maximum flow rate of produced water within the watershed upstream of the project area, 57 and 49 cfs, is much less than the volume of runoff estimated from the 2-year storm event for Dead Horse or Beaver creek drainages. Therefore, the estimated flow rate of water produced from the full development in the watershed above the project area is significantly less than the natural runoff from the area.

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

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

Permit effluent limits are set at (WYPDES part 1 page 1):

Total Petroleum Hydrocarbons	10 mg/l max	
pH	6.5 to 8.5	
TDS	5000 mg/l max	
Specific Conductance	7500 µS/cm max	(2000 at ICP)
SAR	Not Stated	(6 at ICP)
Sulfates	3000 mg/l max	
Radium 226	1 pCi/l max	
Dissolved iron	299.7 µg/l max	
Dissolved manganese	629 µg/l max	
Total Barium	1800 µg/l max	
Total Arsenic	7 µg/l max	
Chlorides	46 mg/l	

The above limits apply to WY0048321.
Permit WY0046922 differs with a dissolved iron limit of 248.6 µg/l max and dissolved manganese of 646.4 µg/l max. This permit did not have a stated ICP.
Permit WY0050709 has a dissolved iron limit of 1000 µg/l max and also has ICP limits.
Permit WY0051462 has a dissolved iron limit of 1000 µg/l max, dissolved manganese limit of 630 µg/l max, a total aluminum limit of 750 µg/l max and also has ICP limits.
Permit WY0038733 only has the following limits:

Total Petroleum Hydrocarbons	10 mg/l max
Specific Conductance	7500 µS/cm max
Total Radium 226	60 pCi/l

The WYPDES permit also addresses existing downstream concerns, such as irrigation use, in the COA for the permit. The designated points of compliance identified for these permits are at the end of pipe of the discharge points. The Irrigation compliance points are located prior to the first downstream points of irrigation/use on Dead Horse Creek.

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

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

In-channel downstream impacts are addressed in the WMP for the South Prong Unit 3 POD prepared by Western Land Services for Williams Production RMT Company.

4.4.2.1. Surface Water Cumulative Effects

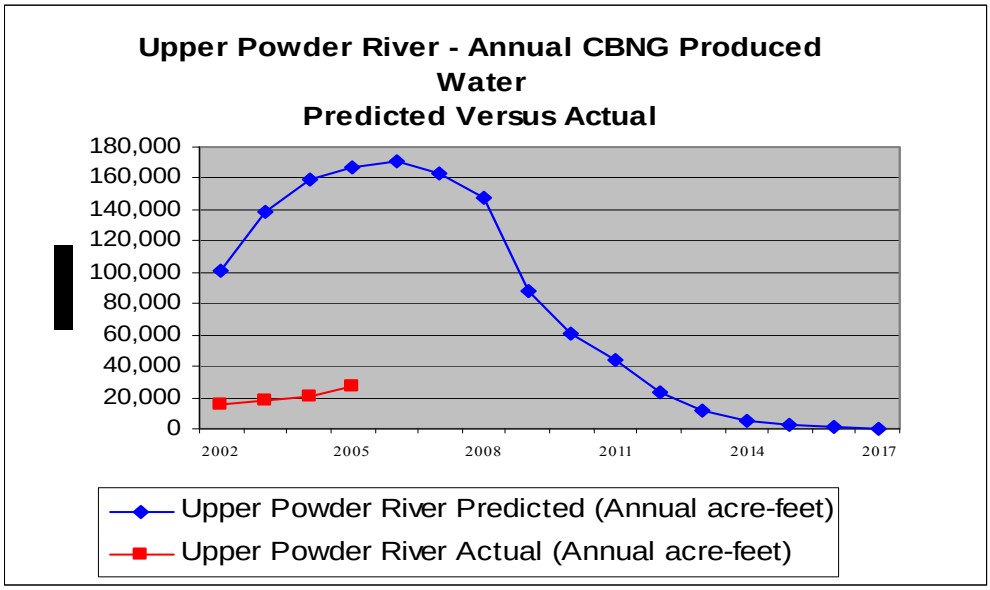
The analysis in this section includes cumulative data from Fee, State and Federal CBNG development in the Upper Powder River watershed. These data were obtained from the Wyoming Oil and Gas Conservation Commission (WOGCC).

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

Table 4.6 Actual vs predicted water production in the Upper Powder River watershed *2005 Data Updated 4-5-06*

Year	Upper Powder River Predicted (Annual acre-feet)	Upper Powder River Predicted (Cumulative acre-feet from 2002)	Upper Powder River Actual (Annual acre-feet)		Upper Powder River Actual (Cumulative acre-feet from 2002)	
			A-ft	% of Predicted	A-Ft	% of Predicted
2002	100,512	100,512	15,846	15.8	15,846	15.8
2003	137,942	238,454	18,578	13.5	34,424	14.4
2004	159,034	397,488	20,991	13.2	55,414	13.9
2005	167,608	565,096	27,658	16.5	83,072	14.7
2006	171,423	736,519				
2007	163,521	900,040				
2008	147,481	1,047,521				
2009	88,046	1,135,567				
2010	60,319	1,195,886				
2011	44,169	1,240,055				
2012	23,697	1,263,752				
2013	12,169	1,275,921				
2014	5,672	1,281,593				
2015	2,242	1,283,835				
2016	1,032	1,284,867				
2017	366	1,285,233				
Total	**1,285,233**					

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



The PRB FEIS identified downstream irrigation water quality as the primary issue for CBNG produced water. 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 parameters 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 only approximately 15% of that total (see section 4.4.2.1).
2. The WDEQ enforcement of the terms and conditions of the WYPDES permit that are designed to protect irrigation downstream.
3. The commitment by the operator to monitor the volume of water discharged.

No additional mitigation measures are required.

Refer to the PRB FEIS, Volume 2, page 4-115 – 117 and table 4-13 for cumulative effects relative to the Upper Powder River watershed and page 117 for cumulative effects common to all sub-watersheds.

4.5. Cultural Resources

The environmentally preferred alternative would affect no known cultural resources. The Bureau has electronically notified the Wyoming State Historic Preservation Officer (SHPO) following section V (B) of the Wyoming State Protocol on 02/08/07 that no historic properties will be affected in the proposed project area.

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 Conditions of Approval*** (General)(A)(1).

4.6. Visual Resource Management

The proposed access roads, pipelines, power lines, wells, and any other new proposed infrastructure will create contrasting elements with the natural existing elements. Many of the new access routes located inside the Class II area are located on ridge tops above the major key observation points along the Interstate, which will not be visible from the Interstate along the northern POD boundary. The majority of the proposed wells within the class II area would not be evidently visible for the casual observer on the Interstate due to the wells have been located below ridgelines or on a side that when standing at the location the Interstate cannot be seen. These wells are more than a 0.25 miles away from the Interstate and there are numerous existing wells closer to the Interstate and more readily seen.

Through analysis and coordination with Williams Production RMT, the visual contrasts between these proposed infrastructures and the existing elements will be reduced so as to meet VRM Class II requirements. Wells will be painted a color that will blend with the existing background.

4.7. Recreation/Travel management

Coalbed Natural Gas development is changing the rural undeveloped nature of the Basin to a rural industrial setting, decreasing the satisfaction levels of many hunters and other recreationists. One BLM permitted outfitter returned his 2005 permit due to client dissatisfaction with hunting in natural gas fields. Other outfitters have also made similar comments and discussed returning their permits.

Drilling and construction activities are disruptive to big game and hunters. Development may be decreasing the satisfaction levels for some recreationists in the area. Construction noise and activity displaces big game and diminishes the solitude and near-wilderness experience many hunters in this area have sought. The hunting experience is expected to improve following construction.

Conflicts between different recreation users and CBNG activities may increase. Goal interference may occur between those seeking solitude and those who enjoy motorized activities, displacing users resulting in a decrease of satisfaction levels and increase conflicts between users. Other conflicts may occur such as visitors and CBNG activity, and an increase in trespassing due to the newly constructed roads leading into private land. The new roads proposed to access the South Prong Unit 3 POD and to access proposed wells within the POD would allow new access to public lands and increase access into private land, which private landowners within the area have expressed great concern over. The CBNG activity may increase safety concerns to recreation users due to use of heavy machinery on the roads.

The PRB FEIS states, “Impacts related to the construction of access roads used to extract Coal Bed Natural Gas include an increase in average daily traffic (ADT), increase in risk of traffic accidents from additional project-related vehicles as well as non-project-related vehicles, increased potential access to remote areas, an increased risk of vehicle collusions with livestock and wildlife, and visual intrusion of project-related vehicles and activities”.

In order to reduce the effects outlined above and to maintain the travel management objectives in the RMP, travel within the POD, on all new roads that would access Federal land, will be restricted to authorized company personnel.

5. CONSULTATION/COORDINATION

Contact	Title	Organization	Present at Onsite
Sarah Needles	Acting State Historic Preservation Officer	Wyoming SHPO	NO
Rich Kintzi	Williams Agent	Western Land Services	YES
Penny Bellah	POD Specialist	Williams Production RMT	YES
Dave Belus		Landowner	YES
Andy Belus		Landowner	YES
Jim Mobly	Construction	Williams Production RMT	YES
Rex Lynde	Drilling	Williams Production RMT	YES

6. OTHER PERMITS REQUIRED

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

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2. 43 CFR All Parts and Sections inclusive - Public Lands: Interior. Revised as of October 1, 2006.

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