

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

Williams Production Company
Wormwood Unit 3

ENVIRONMENTAL ASSESSMENT –WY-070-09-068

DECISION: BLM’s decision is to approve a combination of alternatives C and D as summarized below and described in the attached EA and authorize Williams’ Wormwood Unit 3 Coal Bed Natural Gas (CBNG) POD comprised of the following 13 Applications for Permit to Drill (APDs):

| | Well Name and Number | QTR. | Sec. | TWP | RNG | Lease # |
|----|-----------------------------|-------------|-------------|------------|------------|----------------|
| 1 | WU 12-11-4676 | SWNW | 11 | 46 | 76 | WYW 149235 |
| 2 | WU 21-11-4676 | NENW | 11 | 46 | 76 | WYW 149235 |
| 3 | WU 32-11-4676 | SWNE | 11 | 46 | 76 | WYW 149235 |
| 4 | WU 34-11-4676 | SWSE | 11 | 46 | 76 | WYW 153121 |
| 5 | WU 14-12-4676 | SWSW | 12 | 46 | 76 | WYW 149235 |
| 6 | WU 21-12-4676 | NENW | 12 | 46 | 76 | WYW 149235 |
| 7 | WU 34-12-4676 | SWSE | 12 | 46 | 76 | WYW 149235 |
| 8 | WU 41-12-4676 | NENE | 12 | 46 | 76 | WYW 149235 |
| 9 | WU 43-12-4676 | NESE | 12 | 46 | 76 | WYW 149235 |
| 10 | WU 12-13-4676 | SWNW | 13 | 46 | 76 | WYW 149235 |
| 11 | WU 21-13-4676 | NENW | 13 | 46 | 76 | WYW 149235 |
| 12 | WU 32-13-4676 | SWNE | 13 | 46 | 76 | WYW 149235 |
| 13 | WU 42-13-4676 | SENE | 13 | 46 | 76 | WYW 149235 |

The following well was withdrawn at the onsite due to Sage-grouse lek Controlled Surface Use:

| | Well Name and Number | QTR. | Sec. | TWP | RNG | Lease # |
|---|-----------------------------|-------------|-------------|------------|------------|----------------|
| 1 | WU 41-11-4676 | NENE | 11 | 46 | 76 | WYW 149235 |

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.

SUMMARY OF SELECTED ALTERNATIVE

The selected alternative includes Alternative C and appropriate components of Alternative D as described in the EA that will minimize site specific impacts to sage-grouse and habitat. Timing restrictions on surface-disturbing activities are incorporated from Alternative C.

The following items summarize components of Alternative D included in the selected alternative:

1. All impoundments approved for use in Wormwood 1 and Kingwood 1 PODs will be treated each year to kill mosquito larvae.

Travel along roads within ½ mile of Gilkie Ranch and Gilkie Ranch 2 sage-grouse leks will be posted by the operator at 10 mph during daylight hours between March 1- June 15.

RATIONALE: The decision to authorize the selected alternative, as summarized above, is based on the following:

1. The Operator, in their POD, has committed to:
 - Comply with all applicable Federal, State and Local laws and regulations.
 - Obtain the necessary permits from other agencies for the drilling, completion and production of these wells including water rights appropriations, the installation of water management facilities, water discharge permits, and relevant air quality permits.
 - Offer water well agreements to the owners of record for permitted water wells within ½ mile of a federal CBNG producing well in the POD.
 - Provide water analysis from a designated reference well in each coal zone.
2. The Operator has certified that a Surface Use Agreement has been reached with the Landowners.
3. The selected alternative 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. Furthermore, approval of this development will help meet the nation's future needs for energy reserves, and will help to stimulate local economies by maintaining stability for the workforce.
5. The selected alternative incorporates appropriate local sage-grouse research and the best available science from across the species' range in development of the attached conditions of approval. Mitigation measures from the range of alternatives were selected to best meet the purpose and need, and will be applied by the BLM to minimize environmental impacts. Mitigating measures designed to reduce impacts to sage-grouse and sage-grouse habitat include: eliminate proposed overhead power; well 41-11 dropped to reduce impacts to sage-grouse habitat; crushed vegetation utilized for staging areas instead of mowing to conserve habitat; addition of one centralized gas metering building to reduce well visitation; the existing 2-track road running north through the Gilkie Ranch lek will no longer be used for any oil and gas traffic; utility pipelines only constructed along existing access roads to reduce habitat fragmentation; 30-day site-stabilization and interim reclamation for soils with poor reclamation potential; all impoundments approved for use in Wormwood 1 and Kingwood 1 PODs will be treated each year to kill mosquito larvae; travel along roads within ½ mile of Gilkie Ranch and Gilkie Ranch 2 sage-grouse leks will be posted by the operator at 10 mph during daylight hours between March 1- June 15.
6. Approval of this alternative is in conformance with the PRB FEIS, and the Approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management, Buffalo Field Office, April 2001 (refer to Appendix E of that document relative to adaptive management).
7. The selected alternative incorporates components of the Wyoming Governor's Sage Grouse Implementation Team's "core population area" strategy and executive order and local research to provide appropriate protections for sage-grouse, while meeting the purpose and need for the Wormwood Unit 3 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 the selected alternative, and, therefore, an environmental impact statement is not required.

In conformance with Appendix E, *Record of Decision, Powder River Oil and Gas Project Environmental Impact Statement and Resource Management Plan Amendment* BLM Buffalo Field Office has initiated actions within the PRB FEIS analysis area in response to additional information regarding impacts to sage-grouse. These measures include:

1. Early initiation of a Resource Management Plan (RMP) revision, based on the evaluation of monitoring data generated under the mitigation monitoring and reporting plan (MMRP) in the PRB FEIS Record of Decision

2. Establishment of sage-grouse "focus" areas, encompassing approximately 1 million acres of sage-grouse habitat. These areas are managed under strict guidelines designed to preserve sage-grouse habitat for development of alternatives during the RMP process (Appendix 1).
3. Initiation of a population viability analysis in the Powder River Basin. This is a 24-month project involving the USGS, BLM Miles City Field Office, BLM Buffalo Field Office, and the University of Montana.
4. Development of alternatives that modify the proposed action to reflect the best available science in sage-grouse management.
5. Development of conditions of approval, specific to sage-grouse management, that incorporate some recommendations from recent research, the NE Local Sage-grouse Working Group, and the Petroleum Association of Wyoming.

The implementation of the selected alternative best meets the stated purpose and need for the proposed action. With the application of mitigating measures selected from alternatives C and D, sage-grouse population viability in the Powder River Basin will not be compromised due to the larger scope of planning actions and research initiated by the BLM, Buffalo Field Office.

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: Diana M. D. Date: 8/3/2009

**BUREAU OF LAND MANAGEMENT
BUFFALO FIELD OFFICE
ENVIRONMENTAL ASSESSMENT (EA)
FOR
Williams Production Company
Wormwood Unit 3
PLAN OF DEVELOPMENT
WY-070-09-068**

INTRODUCTION

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

While this document tiers into and incorporates by reference the Wormwood Unit 1 Environmental Assessment (WY-070-06-104) and the Kingwood 1 POD Environmental Assessment (WY-070-06-210), this project EA addresses only site-specific impacts to sage-grouse, and new information that was not covered within the Buffalo Field Office planning documents or the Wormwood Unit 1 and Kingwood 1 EAs.

1. PURPOSE AND NEED

The purpose and need of the proposed action is to determine how, and under what conditions, to allow Williams' surface occupancy to exercise lease rights granted by the United States to develop the oil and gas resources on two federal leaseholds.

Development of the Wormwood Unit 3 POD wells would return royalties to the federal Treasury as well as stimulate local economies.

The BLM recognizes the extraction of natural gas is essential to meeting the nation's future needs for energy. As a result, private exploration and development of federal gas reserves are integral to the agencies' oil and gas leasing programs under the authority of the Mineral Leasing Act of 1920, as amended, and the Federal Land Policy Management Act (FLPMA) of 1976. The oil and gas leasing program managed by BLM encourages the development of domestic oil and gas reserves and reduction of the U.S. dependence on foreign sources of energy.

This action responds to the goals and objectives outlined in the Resource Management Plan for the Public Lands Administered by the Bureau of Land Management (BLM), Buffalo Field Office, April 2001 and the Powder River Oil and Gas Project Environmental Impact Statement and Resource Management Plan Amendment (PRB FEIS) approved April 30, 2003. This action helps move the Project Area towards desired conditions for mineral development with appropriate mitigation consistent with the goals, objectives and decisions outlined in these two documents.

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

The proposed action conforms to the terms and the conditions of the 1985 Buffalo RMP and the PRB FEIS, as required by 43 CFR 1610.5. The BFO RMP is currently under revision.

For the RMP revision, BFO established focus areas with rigorous interim protections in order to preserve

“decision space” during the revision process. Outside the focus areas, BFO continues to apply appropriate, but far less rigorous, site-specific mitigating measures for high-quality sage-grouse habitat with well densities up to 80-acre spacing and may include site-specific mitigating measures suggested by the best available science. Actions within BFO focus areas will be limited to impacts consistent with 640 acre spacing, and must have a plan of development that demonstrates that the proposal can be managed in a manner that effectively conserves sage-grouse habitats (in focus areas) affected by the proposal.

The Wormwood Unit 3 POD does not occur within a sage-grouse core or focus area. However, approximately 91 percent of the project area meets seasonal habitat requirements and are large enough to meet the requirements of the bird (BLM 2008). Sage-grouse habitat models indicate that 34 percent of the project area contains high quality sage-grouse nesting habitat and 90 percent of the project area contains high quality sage-grouse wintering habitat (Walker et al. 2007).

Relationship to Other Environmental Documents:

This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Wormwood Unit 1 POD EA#-WY-070-06-104 approved 07/28/2006, and the Kingwood 1 POD EA#-WY-070-06-210 approved 09/29/06.

2. ALTERNATIVES INCLUDING THE PROPOSED ACTION

Four alternatives, A, B, C and D, were evaluated in determining how to best meet the stated purpose and need of the proposed action. A brief description of each alternative follows. For the complete detailed description of each alternative, including the alternatives considered but not analyzed in detail, see Appendix A.

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

Alternative B, the “proposed action” alternative, summarizes the Wormwood Unit 3 project as originally submitted to the BLM by Williams Petroleum Corporation, prior to any BLM review or modifications. See Appendix A for full description.

2.3. Alternative C – Modified Proposed Action

Alternative C represents a modification of Alternative B based on the operator and BLM working cooperatively to reduce environmental impacts. The description of Alternative C is the same as Alternative B with the addition of the project modifications identified by BLM and the operator following the initial project proposal (Alternative B). At the on-sites, all areas of proposed surface disturbance were inspected to insure that the project would meet BLM multiple use objectives to conserve natural resources while allowing for the extraction of Federal minerals. In some cases, access roads were re-routed, and well locations, pipelines, and facilities 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 Wormwood Unit 3 POD are described in detail in Appendix A.

Alternative C also incorporates the results of sage-grouse habitat mapping efforts in the project area and on-site verification of habitat suitability. This alternative represents BFO efforts to mitigate project-specific impacts to sage-grouse habitat, while maintaining proposed spacing and infrastructure requirements consistent with the purpose and need of the proposed action.

2.4. Alternative D-Sage-Grouse Emphasis

Alternative D represents a modification of Alternative C based on the application of mitigating measures designed to further reduce impacts to sage-grouse and sage-grouse habitat. Alternative D is the same as Alternative C with the addition of the project modifications identified by BLM, guided by seven years of sage-grouse research in the project area. Alternative D represents BFO efforts to mitigate project-specific impacts to sage-grouse habitat, while maintaining proposed spacing and infrastructure requirements consistent with the purpose and need of the proposed action.

In conjunction with project-level modifications, site-specific measures applied for specific wells and infrastructure would maintain open corridors for sage-grouse, provide contiguous habitat patches, and reduce disturbance in and adjacent to sage-grouse habitat.

This alternative incorporates mitigation designed around site-specific habitat characteristics to minimize habitat fragmentation and accelerate return to habitat effectiveness at reclamation.

For a description of the project-level details of Alternative D, see Appendix A.

2.5. Summary of Alternatives

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

Table 2.5 Summary of Alternatives

| Summary of the Alternatives Facility | Alternative A (No Action) Existing Number or Miles | Alternative B (Original Proposal) Proposed Number or Miles | Alternative C (Environmental Alt.1) Revised Number or Miles | Alternative D (Environmental Alt.2) Revised Number or Miles |
|---|---|---|--|--|
| Total CBNG Wells | 10 | 14 | 13 | 13 |
| Well Locations Nonconstructed | | 12 (0.1 acre ea.) | 11 (0.1 acre ea.) | 11 (0.1 acre ea) |
| Constructed | | 0 | 0 | 0 |
| Slotted | | 2 (0.08 acre ea.) | 2 (0.08 acre ea.) | 2 (0.08 acre ea) |
| Conventional Wells | 0 | 0 | 0 | 0 |
| Gather/Metering Facilities | 1 | 1 | 1 | 1 |
| Compressors | 0 | 0 | 0 | 0 |
| Ancillary | 0 | 8 (no | 8(no disturbance) | 8(no |

| Summary of the Alternatives Facility | Alternative A (No Action) Existing Number or Miles | Alternative B (Original Proposal) Proposed Number or Miles | Alternative C (Environmental Alt.1) Revised Number or Miles | Alternative D (Environmental Alt.2) Revised Number or Miles |
|---|---|---|--|--|
| (Staging/Storage Areas) | | disturbance) | | disturbance) |
| Template/Spot Upgrade | 0.00 | 2.06 mi | 2.06 mi | 2.06 mi |
| Roads | 0.00 | 0.42 mi | 0.42 mi | 0.42 mi |
| No Corridor | 0.73 | 1.64 mi | 1.64 mi | 1.64 mi |
| With Corridor | | | | |
| Engineered Roads | 0 | 0 | 0 | 0 |
| No Corridor | 0 | 0 | 0 | 0 |
| With Corridor | 0 | 0 | 0 | 0 |
| Primitive Roads | 1.53 mi | 0.76 mi | 0.76 mi | 0.76 mi |
| No Corridor | 0.20 mi | 0 | 0 | 0 |
| With Corridor | 0.33 mi | 0.76 mi | 0.76 mi | 0.76 mi |
| Buried Utilities | 0.76 mi | 4.18 mi | 4.04 mi | 4.04 mi |
| No Corridor | 0.43 mi | 0 | 0 | 0 |
| With Corridor | 0.33 mi | 4.18 mi | 4.04 mi | 4.04 mi |
| Overhead Powerlines | 0.94 | 1.03 mi | 0 | 0 |
| Buried power | | | | |
| Communication Sites | 0 | 0 | 0 | 0 |
| Monitor Wells | 0 | 0 | 0 | 0 |
| Land Application Disposal | 0 | 0 | 0 | 0 |
| Subsurface Drip Irrigation | 0 | 0 | 0 | 0 |
| Treatment Facilities | 0 | 0 | 0 | 0 |
| Impoundments | | 0 | 0 | 0 |
| On-channel | 1 | 0 | 0 | 0 |
| Water Discharge Points | 1 | 0 | 0 | 0 |
| Channel Disturbance | | | | |
| Headcut Mitigation | 0 | 0 | 0 | 0 |
| Channel Modification | 0 | 0 | 0 | 0 |
| TOTAL ACRES DISTURBANCE | Approx. 13.44 acres | Approx. 18.91 acres | Approx. 15.07 acres | Approx. 15.07 acres |

3. AFFECTED ENVIRONMENT & ENVIRONMENTAL CONSEQUENCES

Applications to drill were received on 09/14/07. Field inspections of the proposed Wormwood Unit 3 CBNG project were conducted on 02/17/09 by the following personnel:

| NAME | TITLE | AGENCY |
|-------------|--------------|---------------|
| Jim Mobley | Construction | Williams |

| NAME | TITLE | AGENCY |
|-------------------|--------------------------|-----------------------|
| Rex Lyndie | Drilling | Williams |
| Cathy Cooper | Vegetation Specialist | Western Land Services |
| Allen Jones | Hydrologist | Western Land Services |
| Zach Bynam | Wildlife Biologist | GMEC |
| Jacob Gay | Biologist | GMEC |
| Dave Huber | Biologist/POD Specialist | Arcadis |
| Casey Friese | NRS/Hydrologist | BLM |
| Debby Green | NRS | BLM |
| Jenny Morton | Wildlife Biologist | BLM |
| Charlie Belerjack | Superintendent | Williams |
| Dan Bock | Production Supervisor | Williams |
| John Iberlin | Surface owner/rancher | |

This section describes the environment that would be affected and the environmental consequences that would result 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. This site-specific analysis tiers into and incorporates by reference the information and analysis contained in the Wormwood Unit 1 POD EA#-WY-070-06-104 approved 07/28/2006, and the Kingwood 1 POD EA#-WY-070-06-210 approved 09/29/06.

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 | | Don Brewer |
| Floodplains | | X | | Debby Green Casey Freise |
| Wilderness Values | | | X | Debby Green |
| ACECs | | | X | Debby Green |
| Water Resources | | X | | Debby Green Casey Freise |
| Air Quality | X | | | Debby Green |
| Cultural or Historical Values | | X | | Seth Lambert |
| Prime or Unique Farmlands | | | X | Debby Green |
| Wild & Scenic Rivers | | | X | Debby Green |
| Wetland/Riparian | | X | | Debby Green Casey Freise |
| Native American Religious Concerns | | X | | Seth Lambert |
| Hazardous Wastes or Solids | | X | | Debby Green |
| Invasive, Nonnative Species | X | | | Debby Green |
| Environmental Justice | | X | | Debby Green |

3.1. Topographic Characteristics of Project Area

The Wormwood Unit 3 POD is located in west-central Campbell County, approximately 56 miles southeast of Buffalo, Wyoming. The project area lies in Township 46 North, Range 76 West, in Sections 11, 12, 13. The project area is inside and immediately east of the approved Wormwood Unit 1 POD approved 07/28/2006. The general topography of the area consists of ephemeral stream bottoms rising to sagebrush and grassland habitats with moderately steep sloping ridges and draws. The development

activity within the Wormwood Unit 3 POD will occur within the middle reaches of the Pumpkin Creek watershed. The climate in the area is semi-arid, averaging 10-14 inches of precipitation annually, more than 55% of which occurs between May and September. CBNG development, conventional oil well production, and livestock grazing are the major land uses within the general area. Land ownership within the POD is held predominantly as private lands by the Iberlin Ranch and smaller holdings by the BLM.

3.2. Vegetation & Soils

Species typical of mixed sagebrush/grass plant community comprise the project area flora. Specific species observed throughout the project area include big-sagebrush (*Artemisia tridentate*), needle and thread (*Stipa comata*), blue grama (*Bouteloua gracilis*), western wheatgrass (*Agropyron sithii*). Cheatgrass or downy brome (*Bromus tectorum*) was noted in the project area. Differences in dominant species within the project area vary with soil type, aspect and topography.

Please refer to the Wormwood Unit 1 POD EA#-WY-070-06-104 approved 07/28/2006, and the Kingwood 1 POD EA#-WY-070-06-210 approved 09/29/06 for details. The environmental consequences on vegetation and soils will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

Cumulative Effects: Most soil disturbances would be short term 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.

Impacts to vegetation and soils from surface disturbance will be reduced by following the operator's plans and BLM applied mitigation. Of the 13 proposed well locations, 11 can be drilled without a well pad being constructed, and 2 will require a constructed slot. Surface disturbance associated with the drilling of the 13 wells without constructed pads would involve digging-out of rig wheel wells (for leveling drill rig on minor slopes), reserve pit construction, and compaction from vehicles driving/parking at the drill site. Total estimated disturbance for 13 proposed CBM wells would be 1.26 acres.

Approximately 2.06 miles of improved roads would be constructed to provide access to various well locations. Approximately 0.76 miles of new two-track trails would be utilized to access well sites. All proposed pipelines (4.04 miles) 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. No proposed pipelines would be constructed outside of corridors. Expedient reclamation of disturbed land with stockpiled topsoil, proper seedbed preparation techniques, and appropriate seed mixes, along with utilization of erosion control measures would ensure land productivity/stability is regained and maximized. One location in the NESE of Section 12 (along proposed improved template road north of well #43-12) was identified to have limited reclamation potential that will require disturbed areas to be stabilized within 30 days of construction. Site specific COAs require this location be stabilized in a manner which eliminates accelerated erosion until a self-perpetuating native community has stabilized the site in accordance with the Wyoming Reclamation Policy.

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

For a detailed record of surface disturbance associated with the Wormwood Unit 3 POD, see table 2.5.

3.2.1. Invasive Species

The following state-listed noxious weeds and/or weed species of concern infestations were discovered by a search of inventory databases on the Wyoming Energy Resource Information Clearinghouse (WERIC) web site. The WERIC database was created cooperatively by the University of Wyoming, BLM and county Weed and Pest offices (www.weric.info):

- Black henbane (*Hyoscyamus niger*) is shown to be extensive in T46N R76W.
- Scotch thistle (*Onopordum acanthium*) infestations are present in adjacent township T46N R77W.

The onsite were conducted during the winter, and due to this, the operator and BLM did not confirm any WERIC identified infestations. However, cheatgrass or downy brome (*Bromus tectorum*) was noted in the project area.

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

The effects of state-listed noxious weeds and/or weed species of concern infestations will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

The operator has committed to the control of noxious weeds and species of concern in an Integrated Pest Management Plan (IPMP) included in the proposal. In addition, mitigation as required by BLM applied COAs will reduce potential impacts from noxious weeds and invasive plants.

3.3. Wildlife

Habitat assessments and wildlife inventory surveys were performed by Arcadis (2007, 2008, 2009). Arcadis performed surveys for roosting bald eagles in the winters of 2006, 2007-2008, and 2008-2009. They performed surveys for known and new raptor nests, aerial and ground lek surveys for greater sage-grouse and sharp-tailed grouse, and black-tailed prairie dog in 2007 and 2008. A survey for mountain plover was conducted in 2008. Surveys for potential Ute ladies'-tresses habitat were conducted in 2006, 2007, and 2008. All surveys were conducted according to the Powder River Basin Interagency Working Group's (PRBIWG) accepted protocols, which are available on the CBM Clearinghouse website (www.cbmclearinghouse.info).

A BLM biologist conducted field visits on February 17, 2009. During that time, the biologist reviewed the wildlife survey information for accuracy, evaluated impacts to wildlife resources, and provided project modification recommendations where wildlife issues arose. The wildlife resources in the project area have been described in the Wormwood Unit 1 POD EA#-WY-070-06-104 approved 07/28/2006, and the Kingwood 1 POD EA#-WY-070-06-210 approved 09/29/06.

3.3.1. Big Game

Effects on pronghorn and mule deer will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

3.3.2. Aquatics

Produced water will be discharged into 29 BLM approved on-channel reservoirs and 4 outfalls that discharge directly into Pumpkin Creek. Effects to aquatics will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

3.3.3. Migratory Birds

Effects to migratory birds will be similar to those identified in the Kingwood 1 POD EAs.

3.3.4. Raptors

Seven nests have been identified within 0.5 miles of the project area boundary or within 0.5 miles of project activities (which are not all confined to the project boundary) (Arcadis 2008, 2007). Two of these were active in 2008, one (nest 4004) with golden eagles and one (nest 5083) with red-tailed hawks (Table 3.2). Golden eagles also occupied a nest (4296) in the project area in 2006, but the nest was not reported on in 2007 and 2008.

Table 3.2 Raptor Nests Identified in the Wormwood Unit 3 Project Area

| BLM ID | UTME | UTMN | Legal Location | Substrate | Year | Condition | Status | Species |
|--------|--------|---------|----------------|-------------------|------|-----------|----------|-----------------|
| 638 | 422265 | 4870870 | S2 T46N R76W | Cottonwood (live) | 2008 | Remnants | Inactive | n/a |
| | | | | | 2007 | Fair | Inactive | n/a |
| | | | | | 2006 | Unknown | Inactive | n/a |
| 4004 | 424693 | 4869429 | S12 T46N R76W | Cottonwood (live) | 2008 | Excellent | Active | Golden Eagle |
| | | | | | 2007 | Excellent | Active | Golden Eagle |
| | | | | | 2006 | Excellent | Active | Golden Eagle |
| 4007 | 422202 | 4870909 | S3 T46N R76W | Cottonwood (live) | 2008 | Remnants | Inactive | n/a |
| | | | | | 2007 | Poor | Inactive | n/a |
| | | | | | 2006 | Excellent | Inactive | n/a |
| 4296 | 424710 | 4869465 | S12 T46N R76W | Cottonwood (live) | 2006 | Unknown | Active | Golden Eagle |
| 4764 | 425133 | 4868437 | S13 T46N R76W | Cottonwood (live) | 2008 | Poor | Inactive | n/a |
| | | | | | 2007 | Poor | Inactive | n/a |
| 5083 | 423051 | 4869229 | S11 T46N R76W | Cottonwood (live) | 2008 | Excellent | Active | Red-tailed Hawk |
| | | | | | 2007 | Fair | Inactive | n/a |
| 5795 | 425201 | 4868643 | S13 T46N R76W | Cottonwood (dead) | 2008 | Poor | Inactive | n/a |
| | | | | | 2008 | Good | Inactive | n/a |

The BLM wildlife biologist recommended that well # 42-13-4676 not be approved at the proposed location, as it is within ¼ mile and in line of sight of BLM nest # 4764. The well was moved east to a ridgeline along the proposed crowned and ditched (C&D) road. The well will be centrally metered off-site to reduce disturbance during the nesting season.

Well # 43-12-4676 will be centrally metered off-site to reduce disturbance to the #4004 golden eagle nest during the nesting season.

To reduce the risk of decreased productivity or nest failure, the BLM BFO requires a 0.5 mile radius timing limitation during the breeding season around raptor nests.

3.3.5. Threatened and Endangered and Sensitive Species

3.3.5.1. Threatened and Endangered Species

3.3.5.1.1. Black-footed Ferret

One black-tailed prairie dog colony was identified by Arcadis within the POD boundary. Impacts to the 4.5 acre colony located in the NWN Section 12, T46N, R76W will be minimal. Effects on black-footed ferret will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

3.3.5.1.2. Ute Ladies'-tresses Orchid

The North Prong Pumpkin Creek which flows through the project area is considered to be potential Ute ladies' tresses (ULT) orchid habitat (Arcadis 2008). There are no known ULT populations in the project area nor were any of the orchids found during surveys conducted by Arcadis in 2006 and 2007. Wormwood 3 project infrastructures are not located where it will impact ULT habitat.

3.3.5.2. Sensitive Species

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

3.3.5.2.1. Sagebrush Obligates

Sagebrush obligates are species that require sagebrush for some part of their life cycle. They cannot survive without sagebrush and its associated perennial grasses and forbs. Shrubland- and grassland-dependent birds are the fastest-declining group of species in North America (Knick et al. 2003).

Sagebrush obligates that may occur in the project area and that are listed as Sensitive species by BLM Wyoming include sage thrasher, Brewer's sparrow, and greater sage-grouse. Sage thrasher and Brewer's sparrow require sagebrush for nesting, with nests typically located within or under the sagebrush canopy. Sage thrashers usually nest in tall dense clumps of sagebrush within areas having some bare ground for foraging. Brewer's sparrows are associated closely with sagebrush habitats having abundant scattered shrubs and short grass (Paige and Ritter 1999). Greater sage-grouse are discussed in more detail below.

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

Fragmentation of shrubsteppe habitat is a major disruption that has consequences for sagebrush-obligate species (Braun et al. 1976; Rotenberry & Wiens 1980a). In fragmented habitats, suitable habitat area remains only as a remnants surrounded by unusable environments (Urban and Shugart 1984; Fahrig & Paloheimo 1988). Populations of sagebrush-obligate species decline because areas of suitable habitat decrease (Temple & Cary 1988), because of lower reproduction, and/or because of higher mortality in remaining habitats (Robinson 1992; Porneluzi et al. 1993). Fragmentation of shrubsteppe has the further potential to affect the conservation of shrub-obligate species because of the permanence of disturbance (Knick and Rotenberry 1995). Several decades are required to reestablish ecologically functioning mature

sagebrush communities. Due to this, sagebrush obligate species may not return even after habitat reestablishment.

3.3.5.2.2. Bald Eagle

A bald eagle winter concentration roost was identified by the BLM data base in a cottonwood stand in Section 11 along the North Prong Pumpkin Creek. Wintering eagle surveys by Arcadis found winter roosting eagles in Section 11 in the December 15, 2006 survey and 4 eagle sightings in Section 23 during the December 23, 2008 survey. No eagles were sighted during January and February surveys in 2008 or 2009 (see table below). Bald eagle use has been inconsistent in the area, but roost trees and prey sources (black-tailed prairie dogs and sheep carcasses) are present.

Table 3.3 Results of Arcadis Bald Eagle Winter Roost Surveys For Wormwood Unit 3 POD

| Date | Time | Number Seen | UTM | Behavior | Survey Method |
|----------|-----------|-----------------------|---------------------|------------------------|---------------|
| 12/15/06 | 0630-0800 | 2 adults | 423042E 4869229N | Perched in roost trees | Ground |
| 12/15/06 | 0630-0800 | 1 adult | 422996E 4869120N | Perched in roost trees | Ground |
| 12/7/07 | 0710 | 3 adults | 422974E 4866682N | Roosting | Ground |
| 12/7/07 | 0710 | 2 adults | 422762E 4866224N | Roosting | Ground |
| 12/14/07 | 0730 | 1 adult | 422974E 4866682N | Roosting | Ground |
| 12/14/07 | 0730 | 2 adults | 422762E 4866224N | Roosting | Ground |
| 12/14/07 | 0730 | 1 adult | 422989E 4866307N | Roosting | Ground |
| 2/5/08 | 1711 | 1 adult | 423265E 4869660N | Perched | Aerial |
| 12/23/08 | | 2 adults, 2 juveniles | | Roosting | Ground |

Effects to wintering bald eagles are similar to those described in the Wormwood Unit 1 and Kingwood 1 POD EAs. The Conditions of Approval protecting wintering bald eagles in the Wormwood Unit 1 POD will be applied in the Wormwood Unit 3 POD.

3.3.5.2.3. Black-tailed prairie dog

One black-tailed prairie dog colony is present within the project boundary in the NWNE Section 12, T46N, R76W. The colony is approximately 4.5 acres in size. No infrastructure will be located within the

colony. William’s will use existing access routes outside of the colony perimeter. Should the colony expand in the future to become near to roads, there is a potential for individual animals to be run over by vehicle traffic.

3.3.5.2.4. Grouse

3.3.5.2.4.1. Greater Sage-grouse

The greater sage-grouse is listed as a sensitive species by BLM (Wyoming). In recent years, several petitions have been submitted to the USFWS to list greater sage-grouse as Threatened or Endangered. On January 12th, 2005, the USFWS issued a decision that the listing of the greater sage-grouse was “not

warranted". However, the decision document noted the need to continue or expand conservation efforts for sage-grouse. In 2007, the U.S. District Court remanded that decision, stating that the USFWS' decision-making process was flawed and ordered the USFWS to conduct a new Status Review as a result of a lawsuit and questions surrounding the 2005 review (Winmill Decision Case No. CV-06-277-E-BLW, December 2007).

Greater sage-grouse are found in prairie, sagebrush shrublands, other shrublands, wet meadows, and agricultural areas; they depend upon substantial sagebrush stands for nesting and winter survival (BLM 2003). Suitable sage-grouse habitat is present throughout the project area. Sagebrush is present in patches throughout the project area. Approximately 91 percent of the project area meets seasonal habitat requirements and are large enough to meet the landscape scale requirements of the bird (BLM 2008). Sage-grouse habitat models indicate that 34 percent of the project area contains high quality sage-grouse nesting habitat and 90 percent of the project area contains high quality sage-grouse wintering habitat (Walker et al. 2007). BLM records identified six sage-grouse leks within 4 miles of the project area. The 4-mile distance was recommended by the State wildlife agencies' ad hoc committee for consideration of oil and gas development effects to nesting habitat (WGFD 2008). These six leks sites are identified below (Table 3.2)

Table 3.4 Sage-grouse leks within four miles from the Wormwood 3 POD project boundary.

| Lek Name | UTM X | UTM Y | ¼, ¼ Section, T N:R W | Location relative to Wormwood 3 POD | Peak Male count (2008) |
|-------------------------------------|--------|----------|--------------------------|---|---------------------------------|
| Upper Kaufman Draw | 425059 | 4875473 | SW SE 24, 47:76 | 3.2 miles north | 1 |
| County Line | 420072 | 48677980 | NW SE 16, 46:76 | 1.7 miles west | 9 |
| County Line North | 418804 | 4871243 | SE NE 5, 46:76 | 2.5 miles northwest | 9 |
| Gilkie Ranch | 424580 | 4870600 | SE SW 1, 46:76 | 0.15 miles north | 8 |
| Gilkie Ranch 2 (not in database) | 423634 | 4870255 | NE NE 11, 46:76 | Within the POD | 6 |
| Innes | 426063 | 4864859 | SE NW 30, 46:75 | 2.0 miles south | 34 |

Alternative C

3.4. Greater sage-grouse Direct and Indirect Effects

Six active leks are within four miles of the Wormwood 3 POD boundary. The proposed action will adversely impact breeding, nesting, brood rearing, as well as winter habitat. According to the Surface Use Plan submitted by Williams for the Wormwood 3 POD, proposed project elements that are anticipated to negatively impact grouse are approximately: CBNG wells on 13 locations, 2.06 miles of new improved roads, 3.6 miles of new pipelines, increased vehicle traffic on established roads and increased noise from compressor stations. Using 0.6 miles as a distance for impacts (Holloran et al. 2007, Aldridge and Boyce 2007), effective sage-grouse habitat loss will be 791 acres from roads, and 4,992 acres from 13 well locations. These numbers are not additive since each well location has an associated road and power and in many cases wells are closer than 0.6 miles to each other. Therefore, the above numbers over-represent anticipated impacts within the project area if totaled, however since most well locations are within 0.6 miles of each other, the entire project area (approximately 1429 acres within the POD boundaries) can be considered affected.

Throughout the onsite process, Williams' representative made adjustments to the well locations and access routes for wildlife reasons. Changes from the onsite to protect sage-grouse include:

- Well 14-11 was dropped at the onsite due to sage-grouse lek CSU stipulations.
- The existing 2-track road running north through the Gilkie Ranch lek will no longer be used for any oil and gas traffic or development. The existing 2-track road north of wells 21-12 and 41-12 must be signed “No oil and gas traffic, ranch traffic only”.
- All proposed overhead power in Section 13 was removed.
- All staging areas will not be mowed but will use crushed vegetation only.

Based on the best available science, which is summarized below, the proposed action will most likely contribute to the extirpation of the local grouse population and subsequent abandonment of the six leks within four miles of the project area.

Alternative D

3.5. Greater sage-grouse Direct and Indirect Effects

Under Alternative D, 13 wells would be approved as described in Alternative C, with additional mitigation, as described in the description of alternatives, applied to reduce impacts to sage-grouse. Direct and indirect impacts Alternative D would reduce human activity during sensitive periods by approximately 25%, and would eliminate surface disturbing and disruptive activity related to production and maintenance during sage-grouse breeding and nesting seasons for the life of the project.

Greater sage-grouse Cumulative Effects

In addition to the direct impacts to sage-grouse habitat that will be created by the federal wells and associated infrastructure the project area does contain existing fee, state, and federal fluid mineral development. The sage-grouse cumulative impact assessment area for this project encompasses a four mile radius from the following leks: Innes, County Line North, Countyline North, Gilkie Ranch, Gilkie Ranch 2, and Upper Kaufman Draw. As of 6/24/09, there are approximately 851 existing wells and associated infrastructure within four miles of the six leks - an area of 134 square miles. The existing well density is approximately 6.4 wells per square mile. Due to this level of development there is a strong potential that the population(s) breeding at these leks may become extirpated without the federal development.

As of 6/24/09, there are 426 proposed federal wells (according to the AFMSS database) (13 are the wells from this project) proposed within four miles of the six leks. With the addition of the proposed wells that are not associated with this proposed action, the well density within four miles of the leks increases to 9.4 wells/section. With approval of alternative C (13 proposed well locations) the well density increases to 9.5 wells/section.

CBNG is a recent development, with the first well drilled in 1987 (Braun et al. 2002). In February 1998 there were 420 producing wells primarily restricted to eastern Campbell County (BFO 1999). By May 2003 there were 26,718 CBNG wells permitted within the BFO area (WGFD 2004). The PRB FEIS estimated 51,000 additional CBNG wells to be drilled over a ten year period beginning in 2003 (BFO 2003).

The Powder River Basin Oil and Gas Project FEIS (BLM 2003) concluded that “Activities associated with the proposed project would affect sage-grouse in several ways. These effects may include: (1) increased direct mortality (including legal hunting, poaching, and collision with power lines and vehicles); (2) the introduction of new perches for raptors and thus the potential change in rate of predation; (3) direct loss or degradation of habitats; (4) indirect disturbance resulting from human activity (including harassment, displacement, and noise); (5) habitat fragmentation (particularly through

construction of roads); and (6) changes in population (pg. 4-257).” The FEIS goes on to state that “implementation of several mitigation measures would reduce the extent of each impact addressed by those measures. Despite these measures, the synergistic effect of several impacts would likely result in a downward trend for the sage-grouse population, and may contribute to the array of cumulative effects that may lead to its federal listing. Local populations may be extirpated in areas of concentrated development, but viability across the Project Area (Powder River Basin) or the entire range of the species is not likely to be compromised (pg. 4-270).”

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

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

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

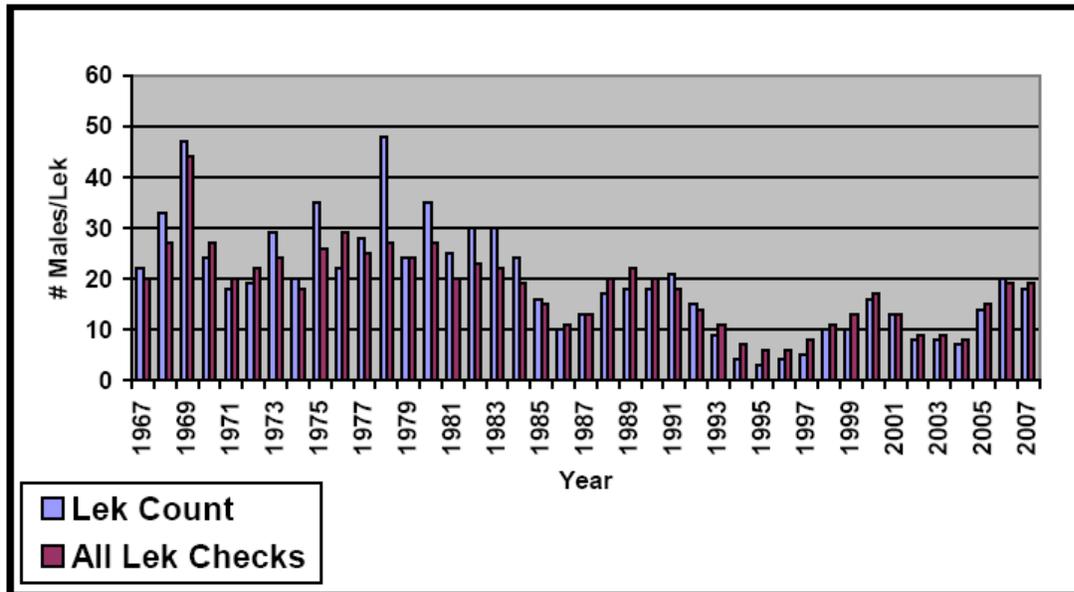
Vegetation communities within the Powder River Basin are naturally fragmented, as they represent a transition between the intermountain basin sagebrush communities to the west and the prairie communities to the east. The Powder River Basin is also near the eastern edge of greater sage-grouse range. A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

the cumulative impacts assessment area has further fragmented the sage-grouse habitat. Disturbance created by this project will contribute to additional fragmentation.

Another concern with CBNG development is that reservoirs created for water disposal provide habitat for mosquitoes associated with West Nile virus (WGFD 2004). West Nile virus represents a significant new stressor, which in 2003 reduced late summer survival of sage-grouse an average of 25% within four populations including the Powder River Basin (Naugle et al. 2004). In northeastern Wyoming and southeastern Montana, West Nile virus-related mortality during the summer resulted in an average decline in annual female survival of 5% from 2003 to 2006 (Walker et al. 2007). Powder River Basin sage-grouse losses during 2004 and 2005 were not as severe. Summer 2003 was warm and dry, more conducive to West Nile virus replication and transmission than the cooler summers of 2004 and 2005 (Cornish pers. comm.).

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

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



The BFO Resource Management Plan (BLM 2001) and the Powder River Basin Oil and Gas Project Record of Decision (BLM 2003) include a two-mile timing limitation within sage-grouse nesting habitat. The two-mile measure originated with the Western Association of Fish and Wildlife Agencies (WAFWA) (BLM 2004). BLM Wyoming adopted the two-mile recommendation in 1990 (BLM 1990). The two-mile recommendation was based on early research which indicated between 59 and 87 percent of sage-grouse nests were located within two miles of a lek (BLM 2004). These studies were conducted within prime, contiguous sage-grouse habitat such as Idaho’s Snake River plain.

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

shrub species (Moynahan et al. 2007). Habitat conditions and sage-grouse biology within the Buffalo Field Office are more similar to Moynahan's north-central Montana study area than the Upper Green River area.

A two-mile timing limitation, given the long-term population decline and that less than 50% of sage-grouse are expected to nest within the limitation area, is insufficient to reverse the population decline. Moynahan and Lindberg (2004) like WAFWA (Connelly et al. 2000), recommend increasing the protective distance around sage-grouse leks. The BLM and University of Montana are currently researching nest location and other sage-grouse questions and relationships between grouse and coalbed natural gas development. Thus far, this research suggests that impacts to leks from energy development are discernable out to a minimum of four miles, and that some leks within this radius have been extirpated as a direct result of energy development (State wildlife agencies' ad hoc committee for sage-grouse and oil and gas development 2008). Even with a timing limitation on construction activities, sage-grouse may avoid nesting within CBNG fields because of the activities associated with operation and production. In a typical landscape in the Powder River Basin, energy development within two miles of leks is projected to reduce the average probability of lek persistence from 87% to 5% percent (Walker et al. 2007).

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

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

In January 2008 BFO staff identified that sage-grouse protections in the 2003 PRB EIS may not be adequate to preserve sage-grouse population viability in the Powder River Basin. BFO consolidated research and data to identify high-quality sage-grouse habitat in the basin and developed map of sage-grouse "focus areas". These areas encompass approximately 1 million acres of habitat, and are managed under criteria established in "Guidance for general management actions during BFO Resource Management Plan Revision" (Appendix 1). This general guidance includes the following requirement; "The proponent will be asked to demonstrate that the proposal can be managed in a manner that effectively conserves sage-grouse habitats affected by the proposal."

Sharp-tailed Grouse

Sharp-tailed grouse habitat within the project area is marginal. No sharp-tailed grouse leks were found during surveys nor were any birds seen during field surveys (Arcadis 2007, 2008). Effects on sharp-tailed grouse will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

Mountain plover

Suitable mountain plover habitat is present but no plovers have been seen during field surveys in the project area. Much of the project area does not qualify as mountain plover habitat due to vegetative height and rough terrain. It is unlikely that mountain plovers will be impacted by the Wormwood 3 project.

Cumulative Impact Analysis: For a complete description of cumulative impacts, please refer to the PRB Final EIS Volume 2, Chapter 4, pages 4-1 through 4-364. Specifically, groundwater cumulative impacts are discussed on pages 4-64 through 4-69 and surface water cumulative impacts are discussed on pages 4-115 through 4-117 and 4-122 through 4-124.

3.6. Water Resources

The project area is within that portion of the Upper Powder River drainage system found within the middle reaches of the Pumpkin Creek watershed. Three tributaries to Pumpkin Creek converge at the upper half of the project area. These tributaries include North Prong, South Prong and Middle Prong. Upstream of the Wormwood Unit 3 POD, the three subwatersheds consist of moderately steep, dissected terrain with average basin slopes ranging from 5.3 to 6.2%. This area and the area within the project boundary mainly consist of rangeland composed of a mixture of sagebrush and upland grass.

The water resources in the project area have been described in the Wormwood Unit 1 POD EA#-WY-070-06-104 approved 07/28/2006, and the Kingwood 1 POD EA#-WY-070-06-210 approved 09/29/06.

Produced water will be discharged into 28 BLM approved on-channel reservoirs and 4 outfalls previously approved in the Wormwood Unit 1 and Kingwood 1 PODs that discharge directly into Pumpkin Creek. All produced effluent from the proposed federal wells within the Wormwood Unit 3 project area as well as 10 fee well sites will be managed through these approved outfalls, all of which are located within the Pumpkin Creek watershed.

The average well site pumping rate (14.5gpm) is based on planned production rates and historic initial production rates from wells completed to the proposed target formations located within the Wormwood 1 and Kingwood 1 project areas. The production rate of 334 gpm for the 23 (13 Federal and 10 Fee) well sites is a maximum case scenario where all wells are completed and activated simultaneously. However, due to drilling schedules, permitting timelines, and operator schedules, drilling and production of all well sites would occur over approximately a three year time frame. This would allow for localized declines of effluent production within the project area. Additional details are available in Wormwood Unit 3 Water Management Plan.

When completed, total anticipated maximum discharge for all wells associated with the approved Wormwood 1 and Kingwood 1 projects areas in addition to the proposed 13 Federal and 10 Fee wells will be 2,437 gpm, 5.43 cfs, or 3,929 acre-feet per year, which is less than the flow associated with a 2-year,

24-hour precipitation event within the Pumpkin Creek watershed. Previously approved water structures in Wormwood 1 and Kingwood 1 PODs will provide adequate storage capacity for produced water from the proposed 13 Federal and 10 Fee wells in the Wormwood Unit 3 project. The Kingwood 1 POD water management plan predicted water production to be 14.5 gpm and the Wormwood 1 POD predicted water production to be 20 gpm. Current water production in both PODs is 4 gpm. This decline in water production supports that the existing infrastructure will provide adequate storage capacity.

Reservoirs previously approved in Wormwood Unit 1 and Kingwood 1 PODs were inspected and approved for use in association with the water management strategy for Wormwood Unit 3. Effects to water resources will be similar to those identified in the Wormwood Unit 1 and Kingwood 1 POD EAs.

3.7. Economics and Recovery of CBNG Resources

Development of this project would have effects on the local, state, and national economies. Based on the estimates in the PRBEIS, the drilling of the 14 proposed wells in the Wormwood Unit 3 POD will

generate approximately 0.35 billion cubic feet of gas (BCFG) per well, over the life of the well. Actual revenue from this amount of gas is difficult to calculate, as there are several variables contributing to the price of gas at any given time. Regardless of the actual dollar amount, the royalties from the gas produced in the Wormwood Unit 3 POD would have wide-ranging benefit. The federal government collects 12.5% of the royalties from all federal wells, which helps offset the costs of maintaining the federal agencies that oversee permitting. In addition to generating federal income, approximately 49% of the royalties from the Wormwood Unit 3 wells would return to the State of Wyoming. This revenue from mineral development has contributed to Wyoming's strong economy for the past several years, allowing for improvements in state funded programs such as infrastructure and education. The development of the Wormwood Unit 3 project would also provide revenue locally by employing an array of workers, both directly and indirectly. People would be employed to build the roads and project infrastructure, drill the wells, and maintain and monitor the project area. The large pool of individuals employed to work on the Wormwood Unit 3 project would also have the secondary effect of increased demand for goods and services from nearby communities, primarily those of Gillette and Wright.

3.8. Cultural Resources

Class III cultural resource inventory was performed for the Wormwood 3 POD prior to on-the-ground project work (BFO project no. 70080023). Arcadis conducted a block and linear class III cultural resource inventory following the Archeology and Historic Preservation, Secretary of the Interior's Standards and Guidelines (48CFR190) and the *Wyoming State Historic Preservation Office Format, Guidelines, and Standards for Class II and III Reports*. Seth Lambert, 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 resources are located in or near the project area.

Table 3.5 Cultural Resources Inventory Results

| Site Number | Site Type | National Register Eligibility |
|-------------|-----------------------|-------------------------------|
| 48CA6677 | Historic | NE |
| 48CA6678 | Prehistoric | NE |
| 48CA6679 | Prehistoric | NE |
| 48CA6680 | Prehistoric | NE |
| 48CA6681 | Prehistoric | NE |
| 48CA6682 | Prehistoric/ Historic | NE |
| 48CA6683 | Historic | NE |
| 48CA6684 | Prehistoric | NE |

No historic properties will be impacted by the proposed project. Following the Wyoming State Protocol Section VI(A)(1) the Bureau of Land Management electronically notified the Wyoming State Historic Preservation Officer (SHPO) on 06/30/09 that no historic properties exist within the APE. If any cultural values [sites, artifacts, human remains (Appendix L PRB FEIS)] are observed during operation of this lease/permit/right-of-way, they will be left intact and the Buffalo Field Manager notified. Further discovery procedures are explained in the Standard COA (General)(A)(1).

3.9. Air Quality

Existing air quality throughout most of the Powder River Basin is in attainment with all ambient air quality standards. Although specific air quality monitoring is not conducted throughout most of the Powder River Basin, air quality conditions in rural areas are likely to be very good, as characterized by limited air pollution emission sources (few industrial facilities and residential emissions in the relatively

small communities and isolated ranches) and good atmospheric dispersion conditions, resulting in relatively low air pollutant concentrations.

Existing air pollutant emission sources within the region include following:

- Exhaust emissions (primarily CO and nitrogen oxides [NOx]) from existing natural gas fired compressor engines used in production of natural gas and CBNG; and, gasoline and diesel vehicle tailpipe emissions of combustion pollutants;
- Dust (particulate matter) generated by vehicle travel on unpaved roads, windblown dust from neighboring areas and road sanding during the winter months;
- Transport of air pollutants from emission sources located outside the region;
- Dust (particulate matter) from coal mines;
- NOx, particulate matter, and other emissions from diesel trains and,
- SO2 and NOx from power plants.

For a complete description of the existing air quality conditions in the Powder River Basin, please refer to the PRB Final EIS Volume 1, Chapter 3, pages 3-291 through 3-299.

In the project area, air quality impacts would occur during construction (due to surface disturbance by earth-moving equipment, vehicle traffic fugitive dust, well testing, as well as drilling rig and vehicle engine exhaust) and production (including non-CBM well production equipment, booster and pipeline compression engine exhaust). The amount of air pollutant emissions during construction would be controlled by watering disturbed soils, and by air pollutant emission limitations imposed by applicable air quality regulatory agencies. Air quality impacts modeled in the PRB FEIS concluded that projected oil & gas development would not violate any local, state, tribal or federal air quality standards.

4. CONSULTATION/COORDINATION

| Contact | Title | Organization | Present at Onsite |
|----------------|--------------------|-----------------------------|-------------------|
| Mary Hopkins | SHPO | SHPO | No |
| Penny Bellah | Regulatory Lead | Williams Production Company | No |
| Don Brewer | Wildlife Biologist | BLM | No |
| Chris Williams | Hydrologist | BLM | No |
| Ray Stott | NRS, Hydrologist | BLM | No |

5. 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.

6. REFERENCES AND AUTHORITIES

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